RITEONTHEBEACH FESTIVAL

COASTLINE PLASTIC WASTE MANAGEMENT IN LAGOS: AN ECOL-ECON BOOST APPROACH FOR SUSTAINABLE DEVELOPMENT

A STUDY OF TARKWA BAY TO BADAGRY 70KM COASTLINE

(A COMPARATIVE ANALYSIS FROM 2021 – 2022)

RITEONTHEBEACH FIELD SURVEY 2022

November 2022

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ABOUT RITEONTHEBEACH FESTIVAL

Riteonthebeach Festival is an environmental movement organized by Riteonthebeach the social enterprise arm of Popbeachclub, sponsored by Rite foods ltd. It's an environmental festival bringing together a collective of students, academics, environmentalists and lovers of nature. To discuss, observe, carry out experiments and collect data, proffering customized solutions to halting the degradation caused by marine plastic to the ecosystem. Restoring the bio diversity of the area, the western peninsula of Lagos state. It's aimed at drawing attention to the effects of the pollutants, marine and ocean plastic, carbon emissions, and their resultant contributions to global climate change.

Riteonthebeach sets up recycling ecosystems in coastal communities lacking disposal infrastructure, with high rates of pollution and poverty. We set up collection locations and employ citizens of those regions to manage these ecosystems. We create a social enterprise where the profits are used to provide scholarships for primary school education.

Riteonthebeach is working to stop ocean plastic, increase literacy and empowering communities through employment. Providing green jobs, eco-tourism, training, and environmental services in a way that promotes gender equality and empowerment of women and girls. Building a circular economy using the concept of social plastic and technology to build transparency. Riteonthebeach unlocks the true value of the material, turning tangible plastic into intangible education, encouraging communities to recover the ocean plastic from the beach.

Riteonthebeach website mentioned that "Plastic collected by Riteonthebeach is recycled by our recycling partners who certify our collection, this enables us to provide offset plans to organizations who want to create a more sustainable, eco-friendly, and socially responsible supply chain for their products".

The four main visions of Riteonthebeach are highlighted below;

- Engaging a community for sustainable development.
- Converting plastic waste to education.
- Unlocking the value in plastic waste.
- Providing opportunities for women and the girl child.

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ABSTRACT

Marine debris including plastic waste, microplastics are distributed worldwide and constitute an increasing threat to wildlife and our environment. The drastic increase of plastic wastes, debris and microplastics has raised concern leading to intensified plastic monitoring, sustainable measures and research. This concern is greater in coastal cities such as Lagos metropolis. However, spatial patterns and knowledge gaps in debris distribution, both on land and at sea are relatively poorly understood, mainly due to lack of comprehensive datasets. This study critically examines the quantity of plastic wastes, debris and microplastics along Tarkwa Bay to Badagry 70km coastline in Lagos State, with a view of determining its influence on the environment, wildlife and economy.

The field data collection was performed manually, while the research design adopted for this study is; experimental research design and quantitative research method

Findings from this study reveals that plastic waste is the prominent and most observed type of waste across every kilometer on the coastline of study. Other type of wastes observed include nylon, polyurethane, charcoal, wood, rubber and metal. Also, study reveals that the plastic waste and microplastics have a negative impact on wildlife along the coastline of study whether directly or indirectly. It was observed that the higher the microplastics present in the ocean water, the lesser the crabs and birds along the coastline i.e., there is a correlation between microplastics and observed wildlife in the study area.

To address the issue of plastic waste, which is a global concern. It is recommended that action plans to adequately curb, mitigate and control the indiscriminate dumping of waste from households, industries and other land sources should be created. Also, there is a need to sensitize the public by organizing campaigns on awareness and educative programs about proper waste disposal and management, including SDG goals and targets towards sustainable development. It is also pertinent that other packaging and single-use alternatives other than plastic be promoted, some of which include paper bags, glass-bottles, ceramics and other environmentally-friendly packaging options. To address the existing pool of plastic and other waste materials along coastlines, it is recommended that the populace of communities along coastlines be empowered to clean up the beach time to time, and be rewarded with incentives for every plastic waste they collect; such incentives as scholarships for education, community health support, food and housing.

CHAPTER ONE BACKGROUND TO THE STUDY

1.0 INTRODUCTION

In September 2015, all the United Nations Member States adopted the 2030 Agenda for

Sustainable Development that includes 17 Sustainable Development Goals (SDGs). The new Agenda emphasizes a holistic approach to achieving sustainable development for all, building on the principle of "leaving no one behind". Within the current global policy frameworks, waste services majorly feature in the targets and indicators of both SDG 11 and SDG 12, notably with commitments to prevent, reduce, recycle and reuse, in accordance with international standards by 2020.

SDG 14.1 is specifically targeted at preventing and significantly reducing marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution by 2025. While also SDG 14.2 is targeted towards sustainably managing and protecting marine and coastal ecosystems to avoid significant adverse impacts, including strengthening their resilience and taking action for restoration in order to achieve healthy and productive oceans by 2020. This goal evidently has not been achieved till date.

The issue of inefficient waste management measures and improper waste disposal, especially plastic waste is a prominent one in Nigeria, particularly in Lagos state, which is characterized by its 180 km long coastline. As a result, the marine habitat and also the coastal regions are contaminated with waste, most of which are plastic waste and microplastics. To achieve sustainable development of the environment and tackle various issues due to the impact of these increasing pollution, various modern strategies, programs, policies and actions have kicked off, however, most of them have had limited success in achieving their course within the targeted time.

This study seeks to examine the quantity of plastic wastes, debris and microplastics along Tarkwa Bay to Badagry coastline in Lagos State, with a view of determining its influence on the environment, wildlife and economy.

1.1 STATEMENT OF RESEARCH PROBLEM

Nigeria generates about 42 million tons of solid wastes per annum, this is more than half of the 62 million tons generated by the whole of sub-Saharan Africa each year. Plastic debris constitutes about 20% of the total solid waste in Nigeria. However, studies show that less than 31% of the solid waste generated is collected. A study by Jambeck et al. (2015) reported that Nigeria contributes 0.13-0.34 million tons of plastic waste to the marine environment, and as such, Nigeria is ranked ninth globally in regard to the pollution of waterways and the sea. This is majorly attributed to the coastal states in Nigeria such as Lagos, Cross river, Ogun, Akwa-Ibom, Bayelsa, Ondo and Rivers.

The Lagos State Commissioner for the Environment Mr. Tunji Bello in 2018 stated that Lagos state alone contributes 450,000 tons of plastic waste to the ocean per annum. Along the over 70km long coastline between Tarkwa Bay and Badagry Beach, large pile-up of waste materials including plastic waste and microplastics have been observed. The negative implication of these waste materials is evident by the decline of wildlife along the coastline and in the ocean. It is time to get at the root of this ocean crisis, proffering a lasting solution to the menace caused by improper waste management at the source, the Lagos metropolis, and other cities, thereby, achieving sustainable development.

1.2 RESEARCH QUESTIONS

- What is the amount of waste along the coastline in comparison to 2021?
- What is the amount of plastic waste along the coastline in comparison to 2021?
- What is the effect of plastic waste on wildlife survival and the economy in comparison to 2021?
- What is the correlation between number of microplastics and observed wildlife?
- What are the plastic waste management measures that influence the economy?

1.3 AIM AND OBJECTIVES OF STUDY

1.3.1 AIM OF STUDY

The aim of this study is to comparatively examine the quantity of plastic waste, debris and microplastics along Tarkwa Bay to Badagry coastline in Lagos State between 2021 and 2022, with a view of determining its influence on the environment, wildlife and economy.

1.3.2 OBJECTIVES OF THE STUDY

i. To observe and estimate the amount of waste along the coastline in comparison to 2021.
ii. To estimate the amount of plastic waste and debris along the coastline in comparison to 2021.
iii. To examine the effect of plastic waste on wildlife survival in comparison to 2021.
iv. To show a correlation between number of microplastics and observed wildlife.
v. To proffer practicable plastic waste management measures and suggest ways it can influence the economy.

1.4 STUDY HYPOTHESIS

H_o: There is no correlation between presence of plastic waste and observed wildlife.

H_i: There is correlation between presence of plastic waste and observed wildlife.

1.5 JUSTIFICATION OF STUDY

The association between plastic trash, microplastics, and the animals near the coast will be better understood as a result of this study, which fills a known knowledge gap.

1.6 SCOPE OF STUDY

Geographically, the study is restricted to the Lagos State, Nigeria, coastline between Tarkwa Bay and Badagry, which spans around 70 km and has a total land area of 7.51 km2. Additionally, this study is restricted to the plastic trash and microplastics found throughout Lagos State's Tarkwa Bay to Badagry coastline.

This is also a comparison of the outcomes from the research festival's first iteration (2021) and the current festival (2022).

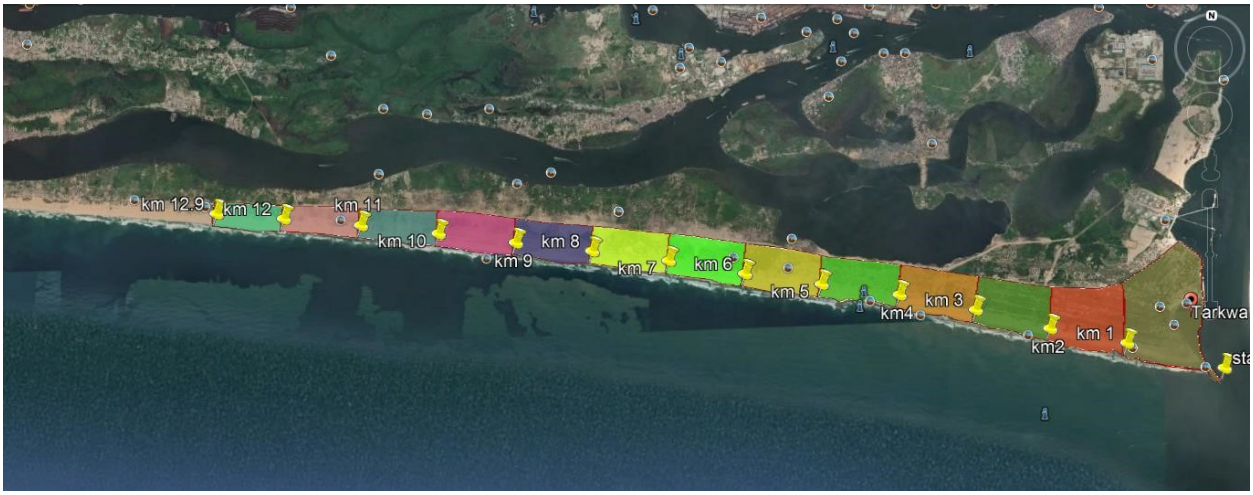
1.7 STUDY AREA

1.7.1 LAGOS STATE

With a population of over 20 million, Lagos is both the largest metropolis in Nigeria and the second most populated city in Africa. Lagos, the economic center of Lagos State and all of Nigeria, is a significant financial hub for Africa. The city, which has a big impact on business, entertainment, technology, education, politics, tourism, art, and fashion, has been called the cultural, financial, and entertainment center of Africa. Lagos is also one of the 10 cities and urban areas with the fastest rate of growth worldwide. The megacity is home to one of the biggest and busiest seaports on the continent and has the fourth-highest GDP in Africa. In Sub-Saharan Africa, the Lagos metropolitan area is a significant center for education and culture. Lagos is also fortunate to have a coastline with stunning beaches.

1.7.2 STUDY LOCATION (SAMPLED STRETCH OF COASTLINE)

According to the Figure below, the study is concentrated on the shoreline from Takwa Bay Beach to Ilashe, which spans 12.9 kilometers and is located in Victoria Island in Lagos, Nigeria's Eti-Osa Local Government Area.



Lagos coastline showing areas of intervals from Tarkwa Bay to Ilashe Beach Source: Google Earth Pro

CHAPTER TWO

2.10 RELEVANT SUSTAINABLE DEVELOPMENT GOALS

GOAL 15: LIFE ON LAND

Targets;

i. By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.
ii. By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.
iii. By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.
iv. By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.
v. Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.
vi. Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed.
vii. Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products.
viii. By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species.
ix. By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts.
x. Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems.
xi. Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.
xii. Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities

GOAL 13: CLIMATE ACTION

Targets;

i. Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
ii. Integrate climate change measures into national policies, strategies and planning.
iii. Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
iv. Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.
v. Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

GOAL 14: LIFE BELOW WATER

Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Targets;

i. By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution
ii. By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.
iii. Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.
iv. By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.
v. By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.
vi. By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least

developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.

vii. By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.

viii. Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.

ix. Provide access for small-scale artisanal fishers to marine resources and markets.

x. Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of The Future We Want.

Debriefing of participants in the field trip

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 PREAMBLE

Every one kilometer, a 1 m x 1 m quadrant was used to manually collect field data and collect trash onto paper for estimation. 50cl plastic bottles were used to gather freshwater samples from the oceans every kilometer. At every kilometer interval, the quantity of wildlife (crabs and birds) along the shore was counted and recorded.

3.1 RESEARCH DESIGN

The experimental research design is the one that is being used. A sort of research called experimental research employs two sets of variables and a scientific methodology. To calculate the differences of the second test, you utilize the first test as a constant. The statistical, mathematical, or numerical analysis of data is emphasized in the quantitative research method.

3.2 DATA TYPES

They are two types of data:

- Primary data source
- Secondary data source

The primary data types include:

- Plastics
- Nylon
- Woods
- Styrofoam
- Charcoal
- Micro-plastics
- Rubber
- Metal

The secondary data types include the following;

- Maps obtained from Google Earth pro and mobile
- Journals
- Literatures - 12 literatures were used for the research

3.3 SAMPLING FRAME AND SAMPLE SIZE

The 70 km of coastline from Tarkwa Bay to Badagry serves as the sampling frame for this study, and the 12.9 km of coastline from Tarkwa Bay to Ilashe Beach is included in the sample size. Samples from the sample frame, which represents 18.4% of the entire 70 km study area, will be utilized to draw general generalizations about the entire study region.

3.4 METHOD OF DATA COLLECTION AND ANALYSIS

The usage and application Google Earth pro was used to map out the boundary and areas per kilometer interval. In order to pinpoint the precise locations of data gathering, interval points were georeferenced.

3.4.1 METHOD OF DATA ANALYSIS AND APPARATUS

The method of analysis used is the quantitative research method. Samples were collected and separated by filtration and sieving method. The apparatus used includes:

- Gloves
- Tables
- Spring balance
- Pen and paper
- Bag

The Procedure includes:

i. The bag was collected and the samples were poured out on a table.
ii. The samples were sorted using separation techniques and counted and the numbers were recorded per KM.
iii. The debris was removed and the samples was weighed per KM.
iv. The sample was then placed back in the bag.

The Precaution taken to ensure maximum efficient result includes:

1. We avoided zero error using the spring balance.
2. Gloves were used/ worn during the experiment to avoid an accident.
3. We ensured that accurate readings were recorded.

Samples collected include 13 pieces of 500ml seawater per KM. Instruments used include;

- Filter paper
- Beaker
- Magnifying glass
- Funnel
- Gloves
- Touch light.

Method: Utilize filter paper, a beaker, and a funnel to filter the 500ml of seawater. Use a magnifying glass and the touch light to count the quantity of microplastics on each filter paper for better vision. Make sure to distinguish plastic from sand with care.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.0 PREAMBLE

In this chapter, the analysis of the gathered data is highlighted. It represents the knowledge obtained from study-related research, statistical analysis, result interpretation, and observations. While the correlation analysis was being used to test the hypothesis, the descriptive analysis of the data that had been collected was given in frequencies, percentages, and mean scores.

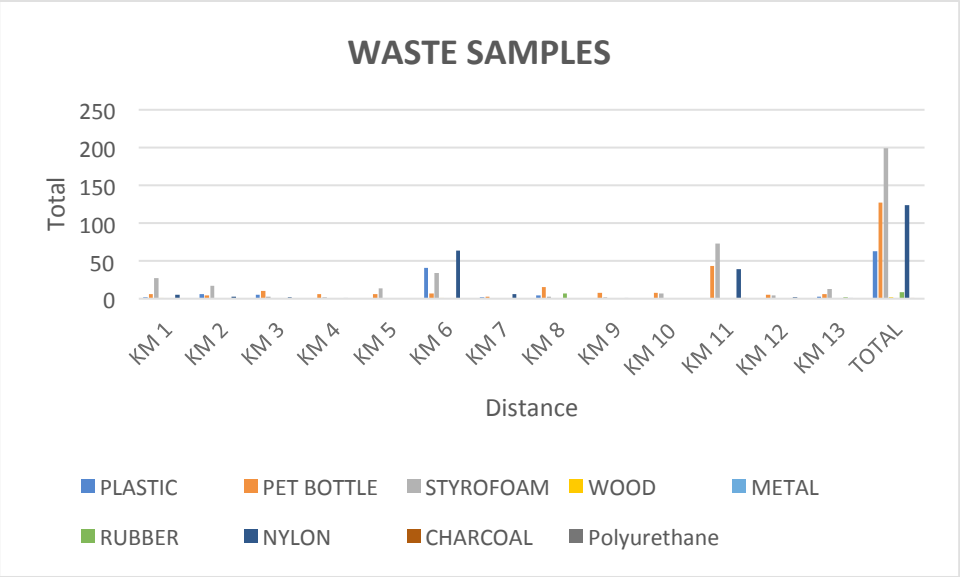
The field survey data were also evaluated and presented in accordance with the objectives of the study, which are described in the first chapter of this paper.

4.1 DATA ANALYSIS AND INTERPRETATION

The survey was carried out over a 12.9-kilometer distance. The purpose of the survey is to determine how plastic waste is affecting the coastline. Nevertheless, during the survey, a variety of waste was found, including Styrofoam, rubber, nylon, charcoal, metal, rubber, and polyurethane. The journey was broken into 13 parts, each measuring one kilometer, with the final unit being 900 meters. During the survey, a sample of the aforementioned trash was collected and measured in kilometers for analysis and inference.

DISTANCE	PLASTIC	PET BOTTLE	STYROFOAM	WOOD	METAL	RUBBER	NYLON	CHARCOAL	Polyurethane
KM 1	2	6	27	1	0	0	5	0	0
KM 2	6	4	17	0	0	0	3	0	0
KM 3	5	10	3	0	0	0	2	0	0
KM 4	0	6	2	0	0	0	1	0	0
KM 5	0	6	14	0	0	0	0	0	0
KM 6	41	7	34	1	0	0	64	0	0
KM 7	2	3	0	0	0	0	6	0	0
KM 8	4	15	3	0	0	7	0	0	0
KM 9	0	8	2	0	0	0	1	0	0
KM 10	0	8	7	0	0	0	0	0	0
KM 11	0	43	73	0	0	0	39	1	0
KM 12	0	5	4	0	0	0	2	0	0
KM 13	3	6	13	0	0	2	1	0	0
TOTAL	63	127	199	2	0	9	124	1	0

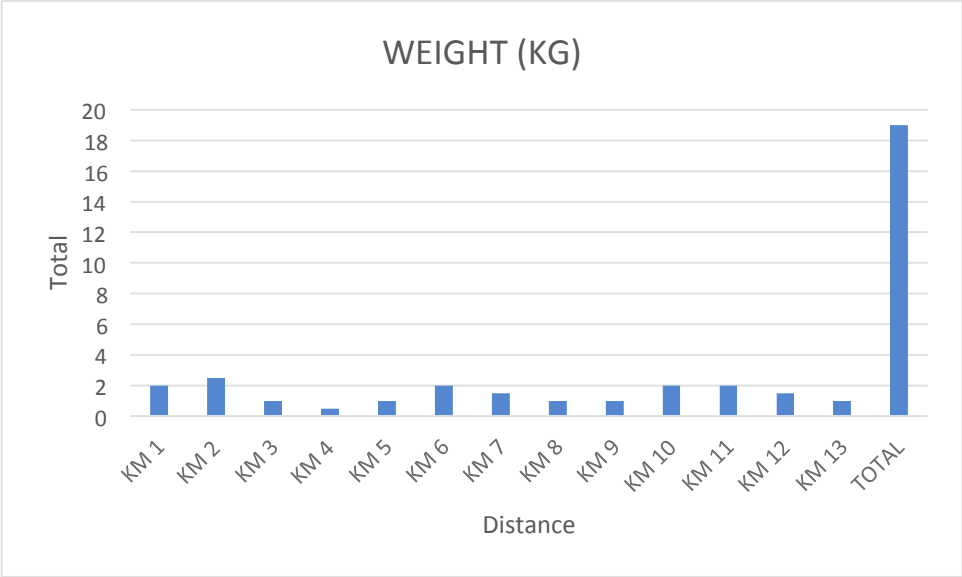
Table showing the amount of Wastes sample collected per-kilometer Source: Riteonthebeach Field Survey, 2022



Clustered column showing the amount of Wastes sample collected per-kilometer Source: Riteonthebeach Field Survey, 2022

DISTANCE	WEIGHT (KG)
KM 1	2
KM 2	2.5
KM 3	1
KM 4	0.5
KM 5	1
KM 6	2
KM 7	1.5
KM 8	1
KM 9	1
KM 10	2
KM 11	2
KM 12	1.5
KM 13	1
TOTAL	19

Table showing the amount of Weight of plastic samples collected per-kilometer Source: Riteonthebeach Field Survey, 2022



Clustered column showing the amount of Weight samples collected per-kilometer Source: Riteonthebeach Field Survey, 2022

The weight of plastic garbage collected per kilometer using a quadrant of one square meter is shown in the table above. Plastic wastes totaled 2.0 kg for kilometer 1, 2.5 kg for kilometer 2, 1.0 kg for kilometer 3, 0.5 kg for kilometer 4, 1.0 kg for kilometer 5, 2.0 kg for kilometer 6, 1.5 kg for kilometer 7, 1.0 kg for kilometer 8, 1.0 kg for kilometer 9, 2.0 kg for kilometer 10, and 2.0 kg for kilometer 11; 1.5 kg for kilometer 12; and 1.0 kg for kilometer 13. The 13.0 kilometers' worth of plastic garbage samples were collected and weighed in total at 19.0 kg.

Studies have conclusively established that plastic trash has an effect on wildlife. The number of animals in the maritime environment may be lessened or made more abundant depending on whether microplastics are present or absent. In the table below, the number of birds and crabs that are most prevalent in the research region is shown for each kilometer.

KM 1 saw the collection of 12 microplastics, the presence of no crabs, and the presence of 5 birds. There were 20 birds available, 10 crabs present, and 3 microplastics were found in KM 2. KM 3 has 12 crabs, 9 microplastics, 20 birds, and 9 available birds. 21 crabs, 2 microplastics, 5 birds, and 2 were accessible at KM 4.

At KM 5, 24 crabs were present, 3 microplastics were found, and 2 birds were on hand. 15 microplastics were found in KM 6, along with 22 crabs and 3 birds. In KM 7, 6 microplastics were found, along with 31 crabs and 3 birds.

At KM 8, 48 crabs were present, 8 microplastics were found, and 1 bird was on hand. In KM 9, 2 microplastics were found, along with 72 crabs and 7 birds. KM 10 saw the collection of 4 microplastics, the presence of 58 crabs, and the absence of any birds. In KM 11, 6 microplastics were found, along with 37 crabs and 7 birds.

At KM 12, 28 crabs were present, 3 microplastics were found, and 4 birds were available, and at KM 13, 2 birds were present, 16 crabs were present, and 10 microplastics were recovered.

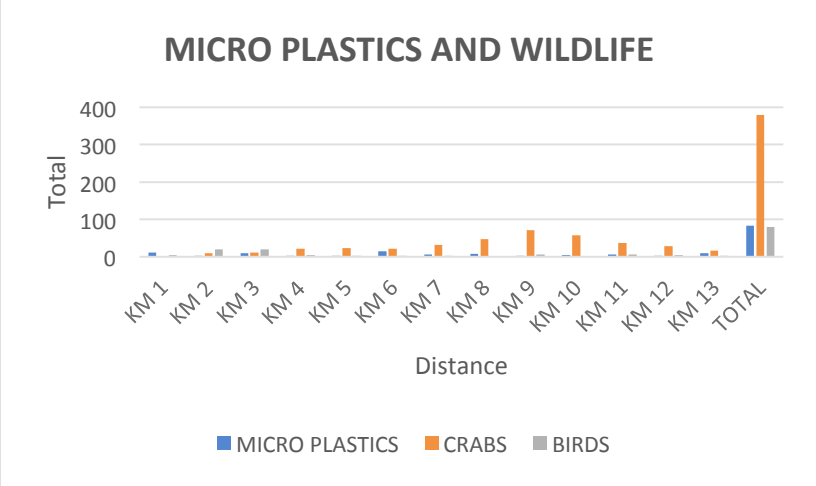
From the analysis above, it can be deduced that the lesser the micro-plastics, the higher the wildlife available in the region.

At KM 1, 12 pieces of microplastic was collected, 0 crabs and 5 birds were observed, accounting for the lowest amount of wildlife. It can be said that the higher the micro-plastic debris available, the lower the wildlife observed. At KM 9, 2 pieces of microplastic was collected, and 72 crabs and 7 bird were observed. Therefore, we can then conclude that the higher the micro-plastics, the lower the wildlife available and vice versa.

The examination of the number of microplastics against the wildlife, such as crabs and birds, recorded during the study is shown in the table below in tabular form.

DISTANCE	MICRO PLASTICS	CRABS	BIRDS
KM 1	12	0	5
KM 2	3	10	20
KM 3	9	12	20
KM 4	2	21	5
KM 5	3	24	2
KM 6	15	22	3
KM 7	6	31	3
KM 8	8	48	1
KM 9	2	72	7
KM 10	4	58	0
KM 11	6	37	7
KM 12	3	28	4
KM 13	10	16	2
TOTAL	83	379	79

Table showing the amount of Microplastics and Wildlife per Kilometer Source: Riteonthebeach Field Survey, 2022



Clustered column showing the amount of Microplastics and Wildlife per Kilometer Source: Riteonthebeach Field Survey, 2022

Correlations

			Microplastics	Crabs	Birds
Spearman's rho	Microplastics	Correlation Coefficient	1.000	-.919**	-.167
		Sig. (2-tailed)	.	.000	.585
		N	13	13	13
	Crabs	Correlation Coefficient	-.919**	1.000	.217
		Sig. (2-tailed)	.000	.	.475
		N	13	13	13
	Birds	Correlation Coefficient	-.167	.217	1.000
		Sig. (2-tailed)	.585	.475	.
		N	13	13	13

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations Matrices of Microplastics and observed Wildlife. Source: Riteonthebeach Field Survey, 2022

The association between microplastic and wildlife ($n=13$, $r=0.0$, $p>0.01$) showed that there is a marginally significant negative link between the two. This shows that the fauna and the microplastic in the ocean water are not moving in the same direction. This implies that the likelihood of wildlife survival in a water body decreases as microplastic concentrations increase, and vice versa.

COMPARATIVE ANALYSIS (2021 – 2022)

To find the similarities and differences between the various datasets from 2021 and the present, comparative analysis would be used in this case.

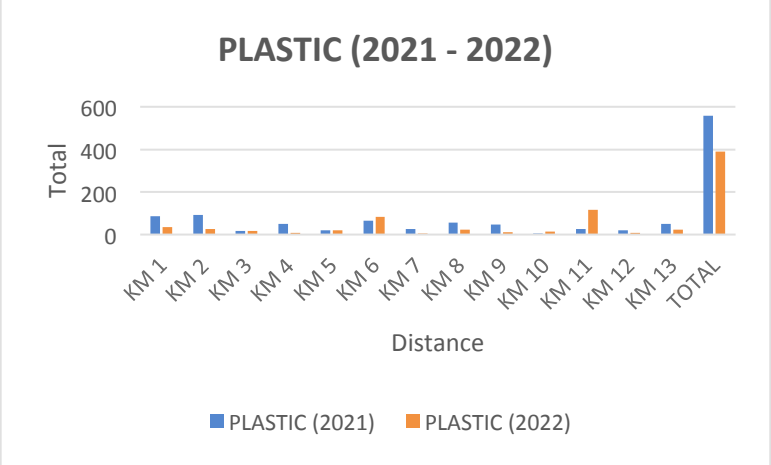
PLASTICS

36 plastics were collected in 2022, compared to 86 plastics in 2021 at KM 1. 93 plastics were collected at KM 2 in 2021, while 27 plastics were collected in 2022. 16 plastics were collected in KM 3 in 2021, while 18 plastics were collected in 2022. A total of 49 plastics were collected in KM 4 in 2021, while 8 plastics were collected in 2022. 20 plastics were collected in KM 5 in 2021 and 2022, respectively. 64 plastics were collected in KM 6 in 2021, while 82 plastics were collected in 2022. 27 plastics were collected in KM 7 in 2021, and 5 plastics were collected in 2022.

56 plastics were collected in KM 8 in 2021, while 22 plastics were collected in 2022. 48 plastics were collected in KM 9 in 2021, and 10 plastics were collected in 2022. 4 plastics were collected in KM 10 in 2021, while 15 plastics were collected in 2022. 27 plastics were collected in KM 11 in 2021, while 116 plastics were collected in 2022. A sum total of 19 plastics were collected in KM 12 in 2021, and 9 plastics were collected in 2022, and 49 plastics were collected at KM 13 in 2021, while 22 plastics were collected there in 2022.

DISTANCE	PLASTIC (2021)	PLASTIC (2022)
KM 1	86	36
KM 2	93	27
KM 3	16	18
KM 4	49	8
KM 5	20	20
KM 6	64	82
KM 7	27	5
KM 8	56	22
KM 9	48	10
KM 10	4	15
KM 11	27	116
KM 12	19	9
KM 13	49	22
TOTAL	558	389

Table showing the number of Plastics per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022



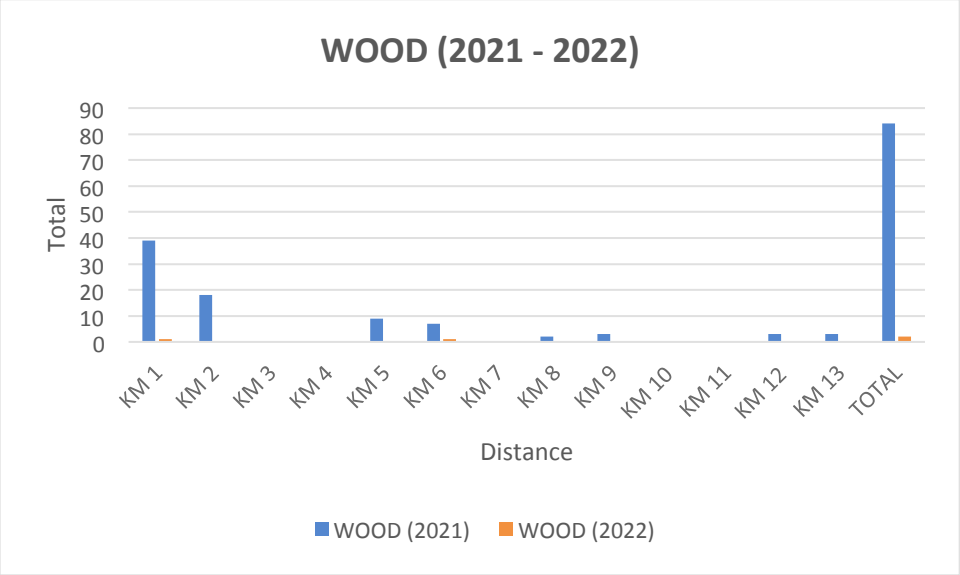
Clustered column showing the number of Plastics per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

WOOD

1 wood was collected in 2022, compared to 39 woods in 2021 at KM 1. 18 woods were collected at KM 2 in 2021, while there was no wood to be recorded in 2022. No woods were collected in KM 3,4,710, and 11 of 2021 and 2022, respectively. 9 woods were collected in KM 5 in 2021 and none in 2022. A total of 7 woods were collected in KM 6 in 2021, while 1 wood was collected in 2022. 2 woods were collected in KM 8 in 2021, while no wood was collected in 2022. 3 woods were collected in KM 9, 12, and 13 in 2021 and none in 2022.

DISTANCE	WOOD (2021)	WOOD (2022)
KM 1	39	1
KM 2	18	0
KM 3	0	0
KM 4	0	0
KM 5	9	0
KM 6	7	1
KM 7	0	0
KM 8	2	0
KM 9	3	0
KM 10	0	0
KM 11	0	0
KM 12	3	0
KM 13	3	0
TOTAL	84	2

Table showing the number of Woods per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

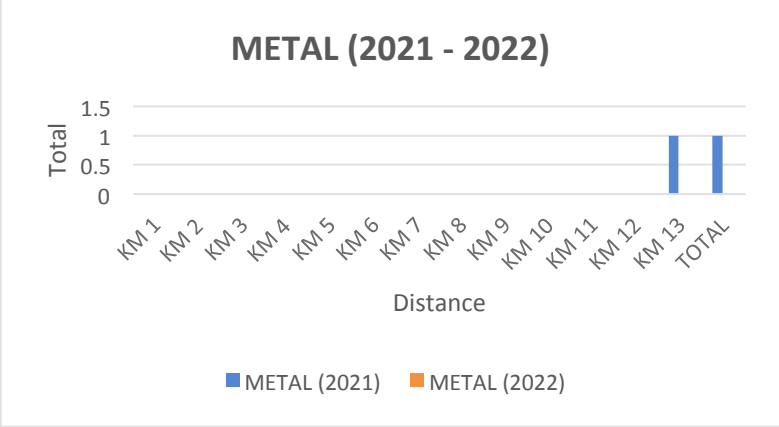


Clustered column showing the number of Woods per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

METALS

DISTANCE	METAL (2021)	METAL (2022)
KM 1	0	0
KM 2	0	0
KM 3	0	0
KM 4	0	0
KM 5	0	0
KM 6	0	0
KM 7	0	0
KM 8	0	0
KM 9	0	0
KM 10	0	0
KM 11	0	0
KM 12	0	0
KM 13	1	0
TOTAL	1	0

Table showing the number of Metals per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

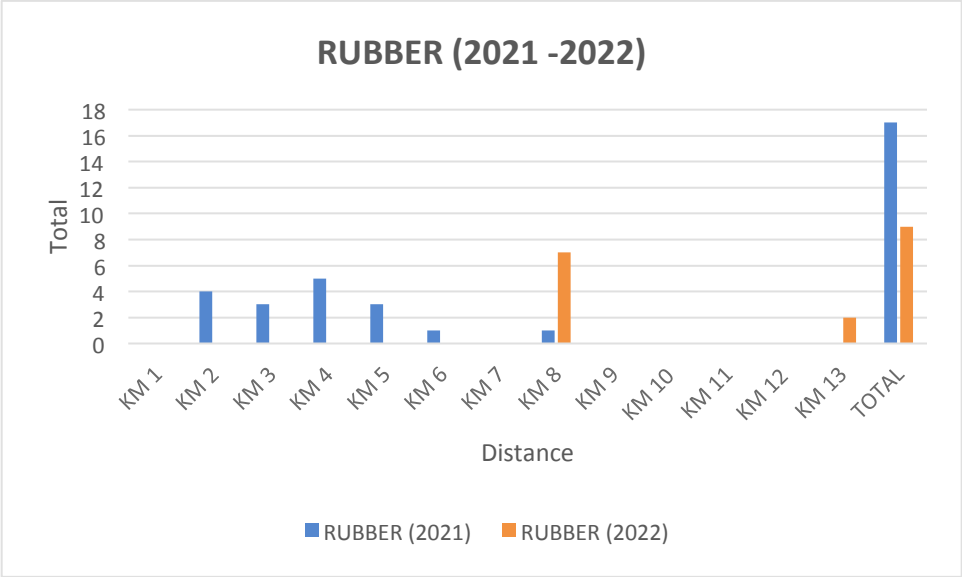


Clustered column showing the number of Metals per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

RUBBERS

DISTANCE	RUBBER (2021)	RUBBER (2022)
KM 1	0	0
KM 2	4	0
KM 3	3	0
KM 4	5	0
KM 5	3	0
KM 6	1	0
KM 7	0	0
KM 8	1	7
KM 9	0	0
KM 10	0	0
KM 11	0	0
KM 12	0	0
KM 13	0	2
TOTAL	17	9

Table showing the number of Rubbers per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

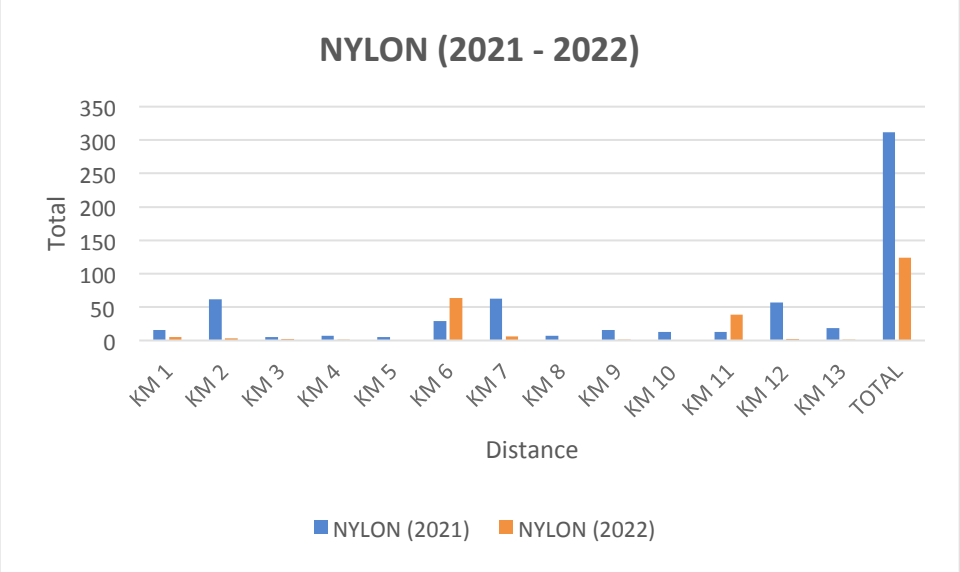


Clustered column showing the number of Rubbers per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

NYLONS

DISTANCE	NYLON (2021)	NYLON (2022)
KM 1	16	5
KM 2	62	3
KM 3	5	2
KM 4	7	1
KM 5	5	0
KM 6	29	64
KM 7	63	6
KM 8	7	0
KM 9	16	1
KM 10	13	0
KM 11	13	39
KM 12	57	2
KM 13	19	1
TOTAL	312	124

Table showing the number of Nylons per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

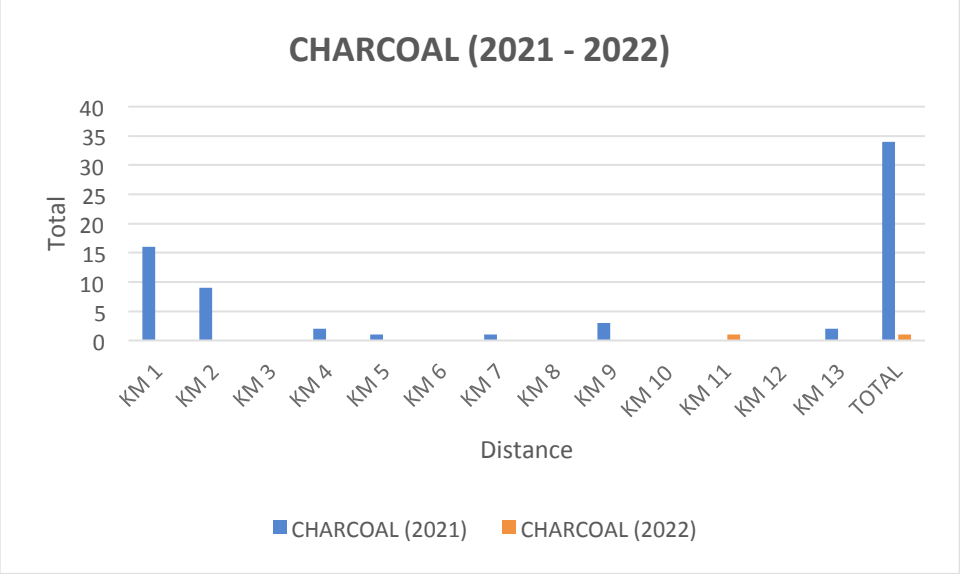


Clustered column showing the number of Nylons per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

CHARCOALS

DISTANCE	CHARCOAL (2021)	CHARCOAL (2022)
KM 1	16	0
KM 2	9	0
KM 3	0	0
KM 4	2	0
KM 5	1	0
KM 6	0	0
KM 7	1	0
KM 8	0	0
KM 9	3	0
KM 10	0	0
KM 11	0	1
KM 12	0	0
KM 13	2	0
TOTAL	34	1

Table showing the number of Charcoals per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

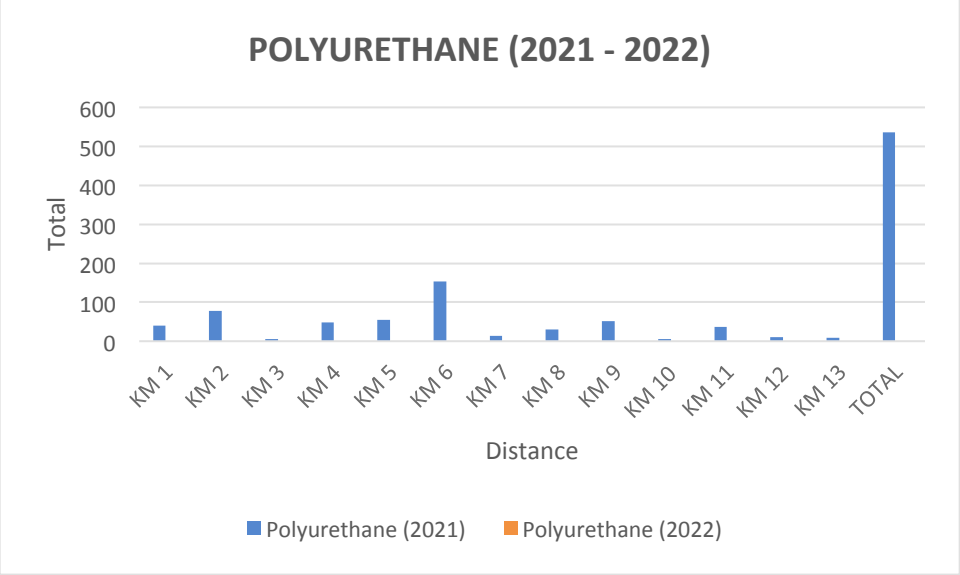


Clustered column showing the number of Charcoals per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

POLYURETHANES

DISTANCE	Polyurethane (2021)	Polyurethane (2022)
KM 1	40	0
KM 2	78	0
KM 3	5	0
KM 4	49	0
KM 5	55	0
KM 6	154	0
KM 7	13	0
KM 8	30	0
KM 9	51	0
KM 10	5	0
KM 11	37	0
KM 12	11	0
KM 13	8	0
TOTAL	536	0

Table showing the number of Polyurethanes per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

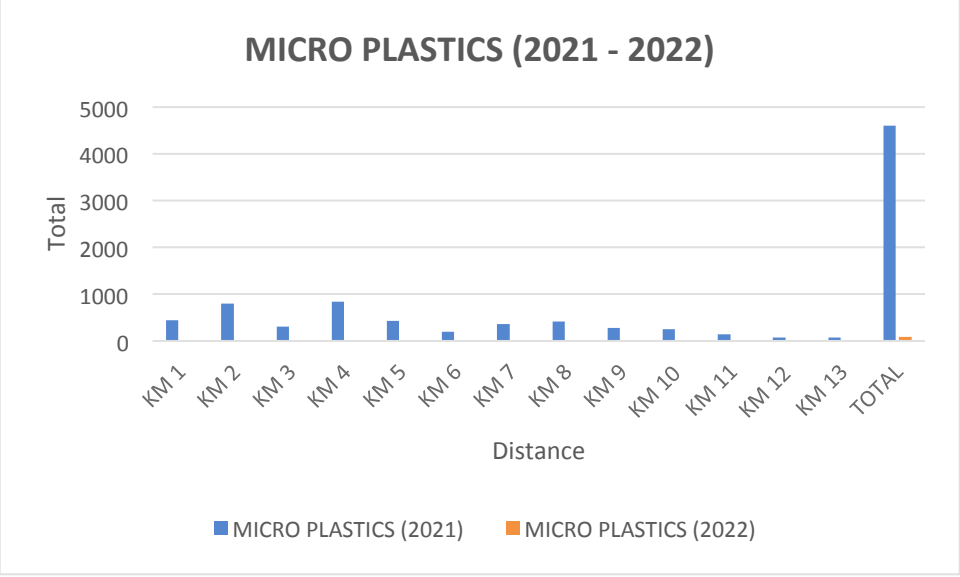


Clustered column showing the number of Polyurethanes per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

MICRO PLASTICS

DISTANCE	MICRO PLASTICS (2021)	MICRO PLASTICS (2022)
KM 1	447	12
KM 2	794	3
KM 3	312	9
KM 4	834	2
KM 5	433	3
KM 6	201	15
KM 7	356	6
KM 8	412	8
KM 9	278	2
KM 10	248	4
KM 11	141	6
KM 12	77	3
KM 13	67	10
TOTAL	4600	83

Table showing the number of Micro Plastics per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

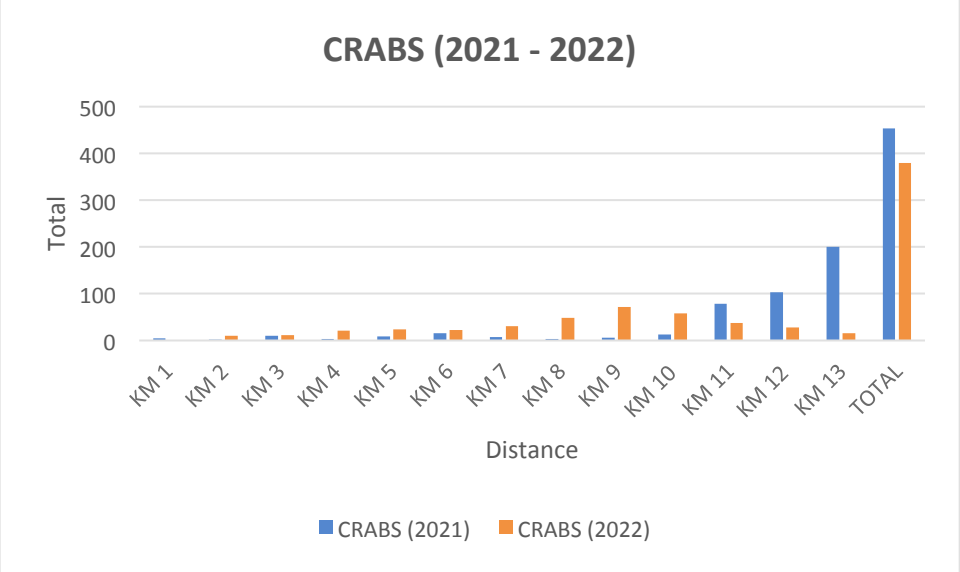


Clustered column showing the number of Micro Plastics per Kilometer Source: Riteonthebeach Field Survey; 2021&

CRABS

DISTANCE	CRABS (2021)	CRABS (2022)
KM 1	4	0
KM 2	2	10
KM 3	10	12
KM 4	3	21
KM 5	9	24
KM 6	15	22
KM 7	8	31
KM 8	3	48
KM 9	6	72
KM 10	13	58
KM 11	78	37
KM 12	103	28
KM 13	200	16
TOTAL	454	379

Table showing the number of Crabs per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

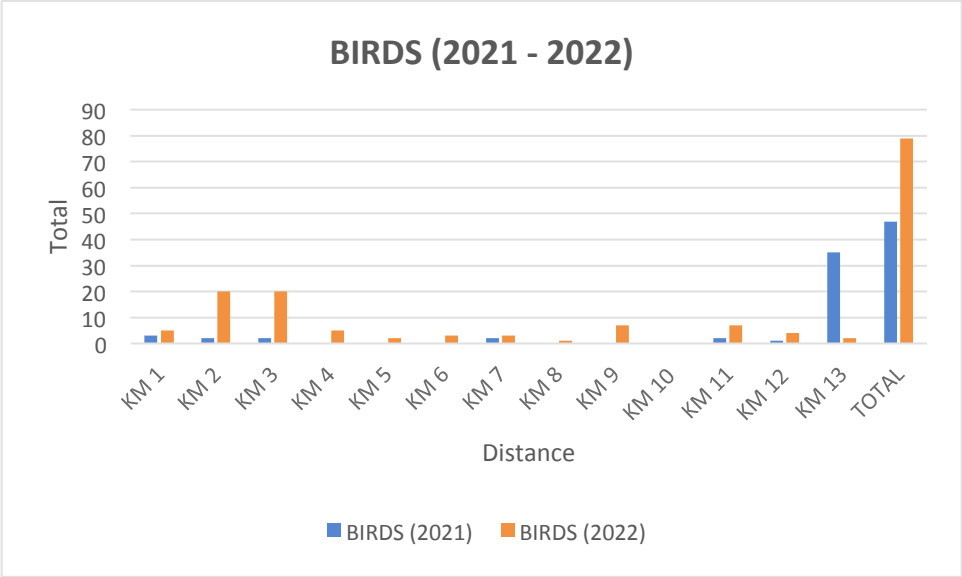


Clustered column showing the number of Crabs per Kilometer Source: Riteonthebeach Field Survey; 2021&

BIRDS

DISTANCE	BIRDS (2021)	BIRDS (2022)
KM 1	3	5
KM 2	2	20
KM 3	2	20
KM 4	0	5
KM 5	0	2
KM 6	0	3
KM 7	2	3
KM 8	0	1
KM 9	0	7
KM 10	0	0
KM 11	2	7
KM 12	1	4
KM 13	35	2
TOTAL	47	79

Table showing the number of Birds per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022

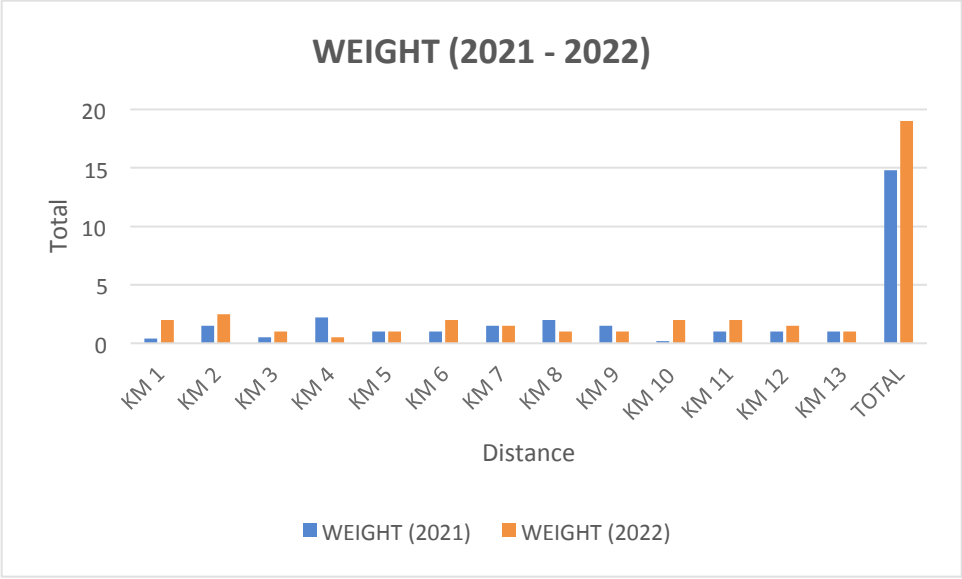


Clustered column showing the number of Birds per Kilometer Source: Riteonthebeach Field Survey; 2021&

WEIGHTS

DISTANCE	WEIGHT (2021)	WEIGHT (2022)
KM 1	0.4	2
KM 2	1.5	2.5
KM 3	0.5	1
KM 4	2.2	0.5
KM 5	1	1
KM 6	1	2
KM 7	1.5	1.5
KM 8	2	1
KM 9	1.5	1
KM 10	0.2	2
KM 11	1	2
KM 12	1	1.5
KM 13	1	1
TOTAL	14.8	19

Table showing the number of Weights per Kilometer Source: Riteonthebeach Field Survey; 2021& 2022



Clustered column showing the number of Weights per Kilometer Source: Riteonthebeach Field Survey; 2021&

4.2 HYPOTHESIS TESTING

H0: There is no connection between wildlife and microplastic.

Given that there is a strong association between microplastic and wildlife deduced from the aforementioned correlation matrix, it follows that there is a significant negative correlation between the survival of wildlife and the existence of microplastic. The alternative, which asserts that "there is considerable association between microplastic and wildlife" in the study area, is accepted because the null hypothesis is rejected.

Participants record findings during the field study

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.0 PREAMBLE

This chapter focuses on a summary of data analysis results that are in line with the study's goals. It also includes judgments reached in light of the data and suggestions.

A. OBSERVED WASTE MATERIALS ALONG THE COASTLINE OF STUDY

For this study, the Lagos coastline was inspected for a distance of 12.9 kilometers (about 13 kilometers), and different types of waste were found and collected over the entire study region each kilometer. Plastics, wood, metals, rubber, nylon, charcoal, polyurethane, and Styrofoam are among the waste products. The examination of the waste materials seen is shown in various tables. Following plastic garbage in prominence and frequency of observation throughout every kilometer of the study's shoreline are polyurethane, nylon, charcoal, wood, rubber, and metal, according to analysis.

B. AMOUNT OF PLASTIC WASTE AND DEBRIS ALONG THE COASTLINE

The study's main area of attention is plastic trash. Following plastic garbage in prominence and frequency of observation along every kilometer of the study's shoreline are polyurethane, nylon, charcoal, wood, rubber, metal, and Styrofoam. Tables display the waste material analysis that was done.

C. THE EFFECT OF MICROPLASTICS ON WILDLIFE SURVIVAL

Studies reveal that the increase of plastic wastes in the marine ecosystem and our environment have a drastic impact on the wildlife. Analysis from the field survey revealed the effect of microplastics on the number of crabs and birds observed along the coastline in the course of the survey. From table 4.2 It can be deduced that the higher the microplastics, the lesser the wildlife available in the region. KM 13 accounts for the highest percentage of wildlife recorded; 44.05%. of the total. And the lowest amount of microplastic 67 (9.72%) deposits of micro-plastics.

It could be said that the higher the microplastic debris available, the lower the wildlife available as seen in KM 4.

We can then conclude that the higher the micro-plastics, the lower the wildlife available and vice versa, therefore, microplastics and plastic wastes have a ripple effect on the survival and availability of wildlife that inhabit in the coastal environment.

D. CORRELATION BETWEEN MICROPLASTICS AND OBSERVED WILDLIFE

The correlation result of microplastic and wildlife ($n=13$, $r=0.0$, $p>0.01$) revealed that there is a weak negative statistically significant relationship between microplastic and wildlife, therefore, there is correlation between microplastics and observed wildlife in the study area. This indicates that the microplastic present in the ocean water and the wildlife are not in the same direction. This suggests that, the more microplastic in the water body, the greater the decline in the survival of wildlife therein.

5.2 OBSERVATIONS DURING ANALYSIS

The following Observations were recorded during the process.

i. There is a variation in the quantity of the samples per Kilometer. Kilometer 1 to Kilometer 13 varies, with Kilometer 1 having the lowest quantity of samples and Kilometer 11-13 having a number lower than 100, it was observed that the presence of humans in an area result in a reduction of plastic wastes along the coastline.
ii. Plastic waste is the prevalent type of waste across the entire width of the coastline.

iii. Wastes are hardly found or deposited across the stretch of thick vegetation cover, wastes are deposited on the sand especially plastics, nylons and other solid wastes.
iv. Kilometer 0 to Kilometer 3 was observed to have the highest waste, thereby, amount of waste materials decreased noticeably between Kilometer 8 to Kilometer 12.9.

5.3 RECOMMENDATIONS

The following doable, environmentally friendly, and economically beneficial suggestions are made in an effort to effectively manage the plastic trash problem, which is becoming a global concern.

- Investigation of creative ways to remove plastics already present in the environment.
- Waste bins should be placed in key areas to stop people and visitors from carelessly discarding plastics.
- Constructing with plastic and creating floating hostels.
- Finding more inventive and different ways to employ edible leaves, bamboo, and coconut shells for restaurants and food vendors rather than Styrofoam.
- Educating natives on sustainable living.
- Establish a location for the collecting of plastic garbage to help with job creation.
- Private companies or people who recycle plastic should receive a task credit.
- Examine how people behave, and eliminate plastics-disposal practices that are not sustainable.
- Cooperating organizations should quit "greenwashing" and start funding studies that promote the long-term recycling of plastic garbage.
- Ecotourism can be employed creatively in art.
- The use of plastics in hostels for hikers and visitors should be regulated and made affordable for all.
- Charly-wat notion Using a cooperative platform, create loans for the community and its members to modernize their restrooms and showers.
- To be able to gather enough garbage, every gas station would serve as a collecting location.
- Marketing plastic-based art supplies, developing a narrative around them, and securing funding.
- Build resources including lodging, tents, health facilities, security, social empowerment, and community engagements. Hold a local market.
- It is advised that an action plan be put in place to effectively stop, lessen, and manage the indiscriminate dumping of garbage gathered from homes, businesses, and other land sources.
- It is necessary to educate the public on good waste management and disposal practices, as well as the SDGs and targets for sustainable development, through campaigns and educational initiatives. One of the most significant goals of this study is to help individuals respect the environment and comprehend the significance of biocentrism. assisting in the careful management and protection of ecosystem resources through effective waste management and disposal.
- It is also important to promote alternatives to plastic for single-use items and packaging, such as paper bags, glass bottles, ceramics, and other eco-friendly alternatives.
- Additionally, to address the accumulation of plastic and other waste materials along coastlines, it is advised that residents of coastal communities be given the authority to periodically clean up the beach and be rewarded with incentives for doing so; these incentives could include educational scholarships, community health support, food, and housing.

- Separation at the source should be promoted in order to decrease the amount of plastic trash that is mixed in with other types of waste. Plastic waste can be disposed of into labelled containers for recycling.
- Reusable packaging products, such as reusable produce bags, supermarket bags, bottles, and utensils, should be promoted in order to effectively decrease the manufacturing of plastics and, as a result, minimize the wastes they produce that pollute our environment, particularly the marine environment.
- In conclusion, it is important to encourage people to take part in beach cleanup programs and events like Rite on the Beach, where they can help remove plastic waste from the ocean and coastline and stop it from ever ending up there. This strategy has shown to be one of the most effective and fruitful approaches to raise public awareness about the problem of ocean plastic pollution.
- One of the contemporary methods for dealing with plastic garbage is turning it into fuel based on petroleum. This process is known as catalytic pyrolysis. It involves the degradation of the polymeric materials by heating them in the absence of oxygen and in the presence of a catalysts. (Christine et al., 2013). Hence, plastic wastes along Lagos coastline can be converted to petroleum energy, boosting the economy of the state and the entire Nation.

The symposium participants at the beginning of the festival

Plastic recovered from the beach through the years at Omnik Nig Ltd polyethylene converters factory for recycling

REFERENCES

Anderson, J.A. and Alford, A.B. 2014. Ghost fishing activity in derelict blue crab traps in Louisiana. Marine Pollution Bulletin 79: 261-267.

Bilkovic, D.M. et al. 2014. Derelict fishing gear in Chesapeake Bay, Virginia: Spatial patterns and implications for marine fauna. Marine Pollution Bulletin 80: 114-123.

Bilkovic, D.M. et al. 2014. Derelict fishing gear in Chesapeake Bay, Virginia: Spatial patterns and implications for marine fauna. Marine Pollution Bulletin 80: 114-123.

Catarina Serra-Gonçalves, Jennifer L. Lavers, and Alexander L. Bond. Global review of beach debris monitoring and future recommendations. Article in Environmental Science and Technology. October 2019 Publication Date (Web).

Christine Cleetus, Shijo Thomas & Soney Verghese (2013). Synthesis of Petroleum-Based Fuel from Waste Plastics and Performance Analysis in a CI Engine. Published Aug 2013. Article ID 608797.

Cole, M., Lindeque, P., Halsband, C., Galloway, T.S., 2011. Microplastics as contaminants in the marine environment: A review. Marine Pollution Bulletin 62, 2588-2597 reviewed the issue of microplastic in the marine environment,

GESAMP. 2015.. Sources, fate and effects of microplastics in the marine environment: a global assessment. (Kershaw, P. J., ed.). (IMO/FAO/UNESCOIOC/UNIDO/WMO/IAEA/UN/UNEP/

Hong, S. et al. 2013. Impacts of marine debris on wild animals in the coastal area of Korea. Marine Pollution Bulletin 66: 117-124.

IUCN 2014. The IUCN Red List of Threatened Species. Version 2014.3. <http://www.iucnredlist.org>.

IUCN, International Union for Conservation of Nature, (2021). Marine Plastics. https://www.iucn.org/resources/issues-briefs/marineplastics#:~:text=The%20most%20visible%20and%20disturbing,are%20filled%20with %20plastic%20debris.

Ivar do Sul, J.A. and Costa, M.F. 2014. The present and future of microplastic pollution in the marine environment. Env. Poll. 185: 352-364.

J.R. Jambeck, R. Geyer, C. Wilcox, T.R. Siegler, M. Perryman, A. Andrady, R. Narayan, K.L. Law, Marine pollution. Plastic waste inputs from land into the ocean, Science 347 (6223) (2015) 768-771.

Oliviera, M. et al. 2012. Effects of exposure to microplastics and PAHs on microalgae Rhodomonas baltica and Tetraselmis chuii. Comp. Bio-chem. Physiol. A Mol. Integr. Physiol. 163: S19-S20.

Plastics Europe Plastics - the Facts 2017: An analysis of European plastics production, demand and waste data Technical Report, Market Research Group, Brussels, Belgium. 340. Retrieved from https://www.plasticseurope.org/application/files/5715/1717/4180/Plastics_the_facts_2017_FINAL_for_website_one_page.pdf

Rasmussen, A.R. et al. 2011. Marine Reptiles. PLoS ONE 6(11): e27373.

The Center for Biological Diversity, (2021). Ocean plastic Pollution and plastic problem. https://www.biologicaldiversity.org/campaigns/ocean_plastics/

Ukuwela, K.D.B. et al. 2012. Hydrophis donaldi (Elapidae, Hydrophiinae), a highly distinctive new species of sea snake from Northern Australia. Zootaxa 3201: 45-47.

Wright, S.L. et al. 2013a. The physical impacts of microplastic on marine organisms. Env. Poll. 178: 483-492.

Zarfl C. et al 2011. Microplastics in oceans. Marine Pollution Bulletin 62: 1589-1591.