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Acknowledgements: see page 12

Developing a Sustainable Economic Model for Ghost Nets Waste through Livelihood Empowerment

Arjun Vora
Bombay International School, arjunvora07@gmail.com

***Abstract* – This research paper examines the economics of waste management of ghost nets (fishing nets discarded at sea) by first understanding the problems caused by ghost nets to ecology and environment, and the motivations of fishermen to release and/or not collect back ghost nets from the sea. The paper then presents research that makes a case for the re-use of ghost nets hauled back from the sea by replacing a key raw material(s) in the chemical industry. Having demonstrated a use, the paper illustrates the economic benefits for the various players in the ghost nets supply chain. It concludes that, in the absence of a government mandate, a pure economic argument is required to incentivise waste collectors to collect and process waste.**

I. Introduction

Waste management is essential in today's context. Governments are tightening laws around industrial responsibility, companies are making an effort to comply with these regulations, and people are realising the importance of reducing, reusing, and recycling waste.

While all stakeholders of this planet must collaborate to manage waste, it is necessary to create economic incentives to achieve a sustained and significant impact of waste management initiatives on our environment. One of the considerable challenges of waste management has always been collecting waste at the source and finding a suitable use for it. A case in point is waste that is left at sea.

Ghost nets are fishing nets that are left at sea because they are either worn out and discarded by fishermen or break away during use due to wear and tear. The ghost nets themselves become a hazard for fish and sea life, entangling fish and turtles that are unable to escape. Turtles are often caught up in these ghost nets and die due to suffocation, as they are unable to come up for air, or suffer injuries on their flippers while trying to dislodge themselves from these nets.

There are three primary types of ghost nets defined mainly by the material they are made of. Fish nets can be made of natural fibre, nylon, or Polyethene Terephthalate (PET). In this paper, we focus on ghost nets made from PET.

This paper explores an economic model to incentivise the collection of ghost nets from the sea. Through primary research, interacting with both chemists and industry players who are experts in PET waste usage, this paper suggests a sustainable economic model that incentivises fishermen to bring back ghost nets waste from the sea. Then, this paper posits that finding and collecting waste when supported by technical research that puts commercial value on the waste creates true sustainability.

II. UNDERSTANDING GHOST NETS AND THE RECYCLED PET MARKET

Ghost nets

Ghost nets are fishing nets that have been abandoned or lost at sea, on beaches or in harbours. They are made from a range of synthetic fibres, nylon and other plastic compounds and are able to travel vast distances once lost or abandoned. These nets are a major contributor to the problem of "Ghost Gear" (all fishing materials that are no longer managed by fishers or fisheries).

While ghost gear contributes to ocean waste pollution, it is also hazardous to marine life, especially turtles and bony fish. Moreover, they can cause further destruction by damaging coral reefs, boats and shorelines. According to the Olive Ridley Project, "Ghost Gear" is formed due to poor weather conditions, illegal fishing activities, destructive fishing techniques, catch overloads and a high cost of retrieval.

The primary reason for these nets being left is the high cost of retrieval. Obtaining ghost nets is a time-consuming task for fishermen. A research team at Dalhousie University in Canada found that during a retrieval effort in Southwest Nova Scotia, fishers removed 7,064 kg (15,573 lbs) of abandoned, lost or discarded fishing gear (ALDFG) over 60 retrieval trips, suggesting that the cost of retrieving a significant amount of ghost gear can be substantial.

Dr Supraja of the Tree Foundation states that "Ghost nets, which means abandoned or lost fishing gear, pose a severe threat to marine life, and are silent killers. Countless marine animals, including sea turtles, dolphins, and fish, are entangled in this waste, leading to injuries, suffocation, and death. The presence of ghost nets in our oceans disrupts ecosystems and undermines marine conservation efforts."

A recent study by the WWF indicates that up to 500,000 to 1 million tonnes of ghost fishing equipment are abandoned annually. 46% of the Great Pacific Garbage Patch consists of ghost nets (i.e. 3 times the size of France), and it accounts for 10% of marine litter and contributes to the destruction of several ecosystems.

It takes 600-800 years for ghost fishing nets to decompose, resulting in these nets remaining on the ocean for extended periods and trapping numerous marine animals, which leads to the destruction of ecosystems. In 2018, it was reported that up to 650,000 marine animals are killed yearly due to ghost nets.

This problem is faced worldwide. The WWF notes that 40,000 gillnets (the most common type of ghost net) are abandoned in South Korean waters every year. In the Northeast Atlantic, 25,000 ghost nets are discarded each year, totalling 1,250 km in length. Moreover, a study shows that 96% of all tangled animals were non-targets for fishermen in Thailand. 7,000km worth of gillnets are lost in the Atlantic Ocean annually, while in the United Arab Emirates, 260,000 traps are lost yearly and 250,000 in the Gulf of Mexico.

In the Gulf of Mannar region in India, ghost nets have affected up to 12% of branching corals and damaged around 25% of a 7.2-hectare coral reef site. This threatens the coral reef ecosystem and the livelihoods of local fishermen who depend on it. Endangered species, such as olive ridley turtles, are frequently found dead along the coasts of Andhra Pradesh and Odisha, entangled in ghost nets.

The solution is the retrieval of ghost gear from these oceans. Yet, for this to be carried out effectively, fishermen need to be incentivised to retrieve ghost gear. The benefit of retrieving ghost gear must outweigh the cost of retrieval. After retrieving ghost gear, several costs are incurred, including loading & unloading charges, segregation charges, and transportation charges, which collectively make the process costly to carry out.

The Tree Foundation has been influential in incentivising fishermen to retrieve ghost gear through the "Incentivization Initiative" established by Dr. Supraja and her team. The organisation provides Rs. 10 per kg of ghost gear collected. Out of this, Rs. 5 goes to the fishermen, and the remaining amount goes to the fisherwomen (mothers or wives of the fishermen). This initiative has already had a tremendous impact. Since the inception of the Ghost Net Retrieval program in 2021, 461 fishermen have collected and handed over 186 tonnes of ghost nets to the TREE Foundation, and 1075 beneficiaries received incentives that have supported their family livelihoods throughout these years. Moreover, the program annually covers an average of 15,000 participants.

Although the program has been successful, the ghost nets aren't being recycled. Rather, they are piling up in landfills, adding to wastage. Additionally, the program requires ongoing funding to compensate fishermen for their efforts in retrieving ghost gear. To combat this problem, an effective circular economy must be established where ghost nets can be recycled into a viable product form. Establishing a recycling market for ghost nets will enable ghost net retrieval participants, namely fishermen, to enter the commercial supply chain in the recycling industry, thereby creating a viable and sustainable retrieval program.

This paper explores the potential for recycling ghost nets by utilising them in an end product to establish a circular economy.

PET and rPET

Fishing nets are typically made from plastic fibres, and Polyethylene Terephthalate (PET) is commonly used in the making of fishing net fibres. PET is a type of plastic processed in the petrochemical industry and is widely used to manufacture various types of plastic products, including bottles, clothing, and shoes.

India is recognised for its high efficiency in managing waste. One such highly recycled material is PET bottles. There is a highly efficient industry for collecting, cleaning, crushing, shredding, and selling PET bottles to the industry, managed by a network of garbage collectors, processors, and traders. Recycled PET (rPET) from recycling PET bottles has found use in various products, including clothing, packaging, polyester resin manufacturing, and even shoes.

The recycled rPET market in India is large and growing quickly. In 2023, India's rPET market size was valued at USD 10.67 billion, with a growth rate of over 7% expected from 2024 to 2030, and projected to reach nearly USD 17.53 billion. India’s PET recycling industry is expected to reach a turnover of Rs 13,500 Cr (USD 1.7 billion) in the next four to five years. Overall, recycling rates are impressive, with approximately 90% of PET being recycled. Demand for rPET has been growing by more than 10% annually in recent years.

In summary, the Indian recycled PET market is very large, valued at over $10 billion currently, and is poised for rapid growth of 7-20% annually in the coming years, driven by increasing PET consumption, sustainability initiatives, and government regulations, making India a major player in the global rPET market.

What can be seen here is that the PET recycling ecosystem in India is well-functioning, and high recycling rates would make it easy for new sources of rPET to be absorbed in the market and industry.

III. RECYCLED PET (rPET) IN THE COMPOSITE RESIN INDUSTRY

Polyethylene Terephthalate Formula (PET)

The chemical formula for PET is $(C_{10}H_8O_4)n$, representing the repeating units of terephthalic acid and ethylene glycol in the Polymer chain. PET is formed through the polymerisation of purified terephthalic acid (PTA) and ethylene glycol (MEG). PTA and MEG are reactive components that join through a chemical process to create the PET polymer.

Introduction to O-UPR and use of recycled PET

Unsaturated polyester resins (UPRs) are a type of thermosetting polymer produced through the reaction of saturated and unsaturated dicarboxylic acids with polyols. Typically, maleic anhydride is used as the unsaturated component, while phthalic anhydride serves as the saturated counterpart, combined with polyols such as ethylene glycol. This chemical reaction yields a viscous liquid that can be further processed by dissolving it in a vinyl monomer, commonly styrene. Once cured, the resin hardens into a durable plastic with good strength, corrosion resistance, and relatively low weight. It is often reinforced with glass fibers to make fiberglass, which has a high strength-to-weight ratio.

UPRs are used by manufacturers of composite products across various industries. Automotive composite manufacturers utilise them to produce body panels and bumper beams. The construction industry uses composites for items such as tiles and pipes. Boat builders use them to make hulls, and architectural product makers use them to make building panels and roofing sheets. Their lightweight and insulating properties make them versatile across different applications.

For this paper, we modify the formulation of a chemical called Orthophalic Unsaturated Polyester Resin (O-UPR), a type of UPR resin used in the production of fibreglass composite products. In a published paper, *Synthesis of Unsaturated Polyester Resin Based on PET Waste*, authors Vanaja Kumary and Deepali Kulkarni provide the technical basis for the use of PET waste in UPR formulation.

The use of rPET flakes in the production of O-UPR was introduced in the Indian industry in the early 2010s by technocrats and entrepreneurs to reduce costs and increase product margins. Dr Trushar Desai, a technologist with over 35 years of experience at a prominent resin manufacturer, said that Indian UPR manufacturers initially developed formulations using rPET to reduce the cost of the finished product.

Although the use of recycled plastic bottle waste (rPET flakes) is now established and the end UPR product made from using this material is acceptable and commercially viable, the use of recycled Ghost nets (rPET nets) in production has never been attempted. The reason is a lack of awareness in the PET recycling industry of the usability of rPET ghost nets.

Having identified a potential use of rPET nets it is essential to understand the technical usability of the material so that a case can be made for all the participants in the supply chain ecosystem that collecting, processing and use of rPET nets is both commercially and economically beneficial to all participants of the ecosystem.

In the chemical industry, a crucial step in developing a new product is testing formulations in a laboratory setting. Under the guidance of chemists and at the laboratory of a prominent chemical manufacturer, I observed the laboratory-scale production of UPR using rPET nets collected from the Tree Foundation, an environmental non-profit organisation in Chennai.

Complete formulations are proprietary and were not shared with me.

Testing of the laboratory batch

Table A below lists the liquid properties of a typical production batch of commercial-grade O-UPR using rPET bottle flakes (column A) and a laboratory batch of O-UPR using rPET nets (Column B). The parameters mentioned in the columns of the Acceptable Range are standard. They are typically found on technical data sheets (TDS) and certificates of analysis (COA) of commercial-grade O-UPR. As one can see, UPR made using recycled PET from both bottles and ghost nets is well within range. We see that the only deviation in the liquid properties is opacity. Recycled PET made UPR is opaque in shade.

TABLE A

Sr.No.	Description	Unit	Acceptance Range		Result	
			Lower Limit	Upper Limit	Production Batch (rPET flakes Bottle) (Column A)	Lab Batch (rPET nets) (Column B)
1	Appearance		Light Pale Yellow Clear Viscous Liquid		Light Pale Yellow Opaque Viscous Liquid	Light Pale Yellow Opaque Viscous Liquid
2	Specific Gravity		1.10	1.12	1.11	1.11
3	Viscosity @ 25^{O}C	cps	450	550	496	450
4	Gel Time @ 30 ^{O}C	Min,Sec	9.00	15.00	13.50	12.56
5	Gel To Peak Time	Min,Sec			8.20	10.30
6	Peak Temperature	^{0}C	160	180	172	165
7	Acid Value	mgKOH/g	16.00	22.00	16.78	16.62
8	Volatile Content	%	32.00	38.00	32.20	32.00
9	Shelf Life @ 25^{0}C	Months	3	3	3	3

Tests as per IS 6746-1994 (Reaffirmed 2005)

Testing of the FRP laminate

Table B below shows us that the laminates made from the rPET nets batch of O-UPR is well within the acceptable range of the tensile and flexural parameters required and comparable to those offered by an industry used product in the form of FRP laminate made from rPET flakes bottle.

TABLE B

Parameter	Unit	Acceptance Range		Result	
		Lower Limit	Upper Limit	FRP Laminate Production Batch (rPET flakes Bottle) (Column A)	FRP Laminate Lab Batch (rPET nets) (Column B)
Tensile Strength	N/mm^2	160	200	183.76	187.56
Tensile Modulus	N/mm^2	12000	15000	13654.3	13800
Flexural Strength	N/mm^2	170	230	172.45	221
Flexural Modulus	N/mm^2	3800	4800	3944.73	4531.84

As can be seen from the two tables above (results from tests run in September 2024), O-UPR made with rPET net is well within the acceptable range. Both the liquid properties of the resin produced in the laboratory and the test fibreglass laminate achieve the desired results. The results thus show that rPET from nets have the potential to be used in O-UPR formulations. Pilot plant production in a 500 kg or 1MT is recommended before full batch production.

IV. COMMERICIAL VIABLITY

To understand the commercial viability of the replacement, let us first understand the market pricing of the replaceable raw materials used in a pure non-rPET grade O-UPR and the market pricing of rPET. The table below displays prices for these raw materials over the past year. Although the full formulations for O-UPR are proprietary, I was given to understand, for academic purposes, that approximately 35% of the UPR formulation by weight of a Pure O-UPR includes PA (~25%) and MEG (~10%). Therefore, when we replace PA and MEG with rPET, we see the following cost difference.

Table C

Month-Year	PA (INR/Kg)	MEG (INR/Kg)	rPET (INR/Kg)	O-UPR (PA + MEG) cost component (INR/Kg)	O-UPR (rPET) cost component (INR/Kg)	Cost Reduction (INR/Kg)
	A	B	C	D=25%*A+10%*B	E=35%*C	D-E
Apr-23	125	55	69	37	24	13
Jun-23	107	55	67	32	24	9
Jul-23	104	52	69	31	24	7
Aug-23	96	56	65	30	23	7
Sep-23	104	55	65	32	23	9
Oct-23	107	57	65	32	23	10
Nov-23	101	54	65	31	23	8
Dec-23	96	54	65	29	23	7
Jan-24	95	59	67	30	23	6
Feb-24	96	59	67	30	23	7
Mar-24	97	61	65	30	23	8
Apr-24	106	58	67	32	23	9
May-24	105	58	67	32	23	9
Jun-24	116	58	69	35	24	11
Jul-24	122	58	69	36	24	12

Market Pricing of O-UPR for the time period shown in Table C averaged INR 115 per Kg through the past year. Thus, the cost reduction as a percentage of market pricing is around 5% to 11%, considering a cost reduction of 6 to 13 INR/kg. The raw material cost difference, therefore, as a percentage of the sale price, is substantial.

V. CONCLUSION

In conclusion, the growing issue of ghost gear can be addressed by recycling it into commercially viable resources, such as O-UPRs, thereby promoting a circular economy and enhancing global sustainability. This study demonstrates that rPET derived from ghost nets is not only cost-effective, with potential cost reductions of over 5%, but also integrates environmental conservation with economic benefits. By retrieving, recycling, and repurposing ghost nets into high-value products, this model has the potential to mitigate ecological damage while supporting key stakeholders, including governments, fishermen, and manufacturers. Scaling such initiatives can drive significant progress in advancing sustainability and achieving long-term environmental and economic goals.

VI. PART II - VALIDATION

Having completed Part I of the research, I decided to validate the results of my study with the industry, specifically, with a well-known and respected manufacturer of composite resins. Scott Bader India, an Indian subsidiary of the world-renowned British multinational Scott Bader Group, allowed me the use of their facility, and their chemists helped me validate results. Presented below are the results of both the liquid and physical properties of the cast and laminate made using Ghost nets. Tests were carried out in July 25.

Certificate of Analysis of the sample produced

SCOTT BADER

Scott Bader Private Limited

1st Floor, Building No. 1,
S.No. 678/1/3, Plot No. 6,
Bhilad Silvassa Road, Naroli, Silvassa
Dadra and Nagar Haveli and Daman and Diu - 3962
Tel. No : +91 224220 1555
GSTIN/UIN : 26ABICS6288C1Z2

PAN NO. : ABICS6288C
CIN : U24290MH2022PTC383674

CERTIFICATE OF ANALYSIS
(EN10204 3.1)

Page: 1

Customer Order

(date format is: DD-MM-YY)
Print date
28-07-25

Description
espol™-32.06

Lot number
0003475238

Manufacture date
24-07-25

Comments

Result Description	Result	Units	Acceptance Range			
APP- Light Pale Yellow opaque Viscous	Accepted	Light Pale Yellow opq Viscous				
Specific Gravity-WeightperGallonCup@24	1.11	g/cm3	>=	1.10	<=	1.12
AV- ON RESIN AS SUPPLIED	16.03	mgKOH/g	>=	10.00	<=	18.00
Volatile Organic Compounds	30.10	%	>=	30.00	<=	36.00
VISC-BF-LVT SP3 , 60RPM @ 25C	530	mPa.s	>=	450	<=	550
GT @30°C 1ml Co 2% + 1.5 ML BM50	9.5	Min	>=	9.0	<=	15.0
Maximum Exotherm Temperature	178.0	°C	>=	150.0	<=	190.0

Shelf Life : The material supplied is fit for purpose for 3 months from date of manufacture, if stored as recommended.

Storage conditions: Store between 5 and 25°C in the original, unopened container in a dry, well ventilated place. Protect from freezing and direct sunlight. Avoid contact with oxidising agents. If stored outside of the recommended storage conditions shelf life will be significantly reduced

This document is processed electronically and carries no signature of approval.
Quality department manager.

Certificate of Analysis – Laminate

CRYSTIC® | SCOTT BADER Making a positive difference | espol™

Certificate No.: QC/23-24/ **Date: 28/07/2025**	**CERTIFICATE OF ANALYSIS** **Complies to IS-6746-1994 (Reaffirmed 2005)**	S.No. 678/1/3, Plot No. 6, Bldg No. 1, Floor No 1, Bhilad Silvassa Road, Naroli, Dadra And Nagar Haveli, Dadra and Nagar Haveli and Daman and Diu, 396235, India
		SBPL/FP COA
		Rev.03-DT:10.08.23

Batch Number:	**#0003475238 (#L 15048)**
Product Name:	PET- FN / espol™ 32.06
HS Code:	**39079120**
Date of Manufacture:	24-Jul-25
Date of Expiry:	22-Oct-25

Tests as per IS 6746-1994 (Reaffirmed 2005)

MECHANICAL PROPERTY - LAMINNATE

Sr.No.	Description	Unit	Acceptance Range		Result	
			Lower Limit	Upper Limit	Lab Batch No-# L15048 (PET-FN) - LAMINATE	Remarks
1	Tensile Strength	N/mm^2	150	200	184.61	Average of 5 Readings
2	Tensile Modulus	N/mm^2	13000	20000	16680	Average of 5 Readings
3	Flexural Strength	N/mm^2	200	300	270.72	Average of 5 Readings
4	Flexural Modulus	N/mm^2	4000	6000	5159.09	Average of 5 Readings
5	HDT	Deg. C.	45	50	NA	

Note	**The material supplied is fit for purpose for 3 months from date of manufacture, if stored as recommended at 25°C in the original, unopened container in a dry, well ventilated place. Protect from direct sunlight. Avoid contact with oxidising agents. If stored outside of the recommended storage conditions, shelf life will be significantly reduced. Mix throughly before use.**

QA Manager **QA Chemist**

Certificate of Analysis - Cast

Certificate No.: **QC/23-24/** **Date: 28/07/2025**	**CERTIFICATE OF ANALYSIS** **Complies to IS-6746-1994 (Reaffirmed 2005)**	S.No. 678/1/3, Plot No. 6, Bldg No. 1, Floor No 1, Bhilad Silvassa Road, Naroli, Dadra And Nagar Haveli, Dadra and Nagar Haveli and Daman and Diu, 396235, India SBPL/FP COA Rev.03-DT:10.08.23

Batch Number:	**# 0003475238 (# L 15048)**
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Date of Manufacture:	24-Jul-25
Date of Expiry:	22-Oct-25

Tests as per IS 6746-1994 (Reaffirmed 2005)

MECHANICAL PROPERTY - CAST

Sr.No.	Description	Unit	Acceptance Range		Result	
			Lower Limit	Upper Limit	Lab Batch No-# L15048 (PET-FN) - CAST	Remarks
1	Tensile Strength	N/mm^2	28	35	28.36	Average of 5 Readings
2	Tensile Modulus	N/mm^2	1700	2000	1835	Average of 5 Readings
3	Flexural Strength	N/mm^2	55	65	59.54	Average of 5 Readings
4	Flexural Modulus	N/mm^2	700	1000	765.5	Average of 5 Readings
5	HDT	Deg. C.	45	50	45.2^{O}C	

Note	**The material supplied is fit for purpose for 3 months from date of manufacture, if stored as recommended at 25°C in the original, unopened container in a dry, well ventilated place. Protect from direct sunlight. Avoid contact with oxidising agents. If stored outside of the recommended storage conditions, shelf life will be significantly reduced. Mix throughly before use.**

QA Manager **QA Chemist**

Disclaimer: While Test results are based on our laboratory experiments and correct to the best of our knowledge, users (customers) are recommended to establish themselves that the process and materials are satisfactory for their requirements. No liability is accepted by Scott Bader Pvt Ltd for any losses and damages.

Tensile and Flexural Testing (Cast)

TENSILE TESTING

PET-FN # L 15048 (CAST) Date :- 19.07.25

Post cure condition :- 3 Hrs at 80^{O}C

Sr No.	Thickness	Width	Cross Section Area	Peak Load	Tensile Strength	Tensile Modulus	% Elongation
	(mm)	(mm)	(mm^2)	(N)	(N/mm^2)	(N/mm^2)	
1	5.52	24.97	137.83	3995	28.98	1829	3.21
2	5.34	25.10	134.04	3815	28.46	1904	2.84
3	5.33	25.07	133.62	3710	27.76	1838	3.02
4	5.37	25.08	134.68	3795	28.17	1702	3.09
5	5.32	25.14	133.74	3805	28.45	1904	2.75
					Average =28.36	**1835**	**2.98**

FLEXURAL TESTING

PET-FN # L 15048 (CAST) Date :- 21.07.25

Post cure condition :- 3 Hrs at 80^{O}C

Sr No	Thickness (mm)	Width (mm)	C S Area (mm^2)	Load (N)	Span Length	Flexural Strength (N/mm^2)	Flexural Moudulus (N/mm2)
1	5.35	10.30	55.10	144.00	85	62.27	843.39
2	5.32	10.35	55.06	136.00	85	59.19	800.03
3	5.40	10.30	55.62	142.00	85	60.28	803.95
4	5.35	10.35	55.37	137.00	85	58.96	772.48
5	5.35	10.47	26.01	134.00	85	57.01	762.89
Mean						**Average = 58.61**	**796.54**

Tensile and Flexural Testing (Laminate)

TENSILE TESTING

PET-FN # L 15048 (LAMINATE) Date :- 19.07.25

Post cure condition :- 3 Hrs at 80^{O}C

Sr No.	Thickness	Width	Cross Section Area	Peak Load	Tensile Strength	Tensile Modulus	% Elongation
	(mm)	(mm)	(mm^2)	(N)	(N/mm^2)	(N/mm^2)	
1	4.01	25.44	102.01	19100	187.22	17905	2.40
2	3.60	25.43	91.54	16825	183.78	19148	1.33
3	3.80	25.53	97.010	17970	185.23	15614	1.36
4	3.50	25.25	88.300	16915	191.55	14899	1.30
5	4.10	25.45	104.340	18290	175.28	15836	1.7
					Average =184.61	**16680**	**1.62**

FLEXURAL TESTING

PET-FN # L 15048 (LAMINATE) Date :- 21.07.25

Post cure condition :- 3 Hrs at 80^{O}C

Sr No	Thickness (mm)	Width (mm)	C S Area (mm^2)	Load (N)	Span Length	Flexural Strength (N/mm^2)	Flexural Moudulus (N/mm2)
1	3.92	11.03	43.23	472.50	66	275.98	5598
2	4.34	10.95	47.52	523.50	66	251.28	4543
3	4.19	11.02	46.17	551.50	66	282.20	4964.83
4	3.9	11.16	43.52	492.00	66	286.95	5706.93
5	4.15	10.85	45.02	485.50	66	257.2	4982.71
Mean						**Average = 270.72**	**5159.09**

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6. Members of the fishing community for their insights and discussions on ocean waste, marine life and fishnet collection.

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