



# Monitoring and assessment programme on plastic litter in Viet Nam shoreline

Report 2019

Greenhub, IUCN Viet Nam



INTERNATIONAL UNION FOR CONSERVATION OF NATURE



## About IUCN

IUCN is a membership Union uniquely composed of both government and civil society organisations. It provides public, private and non-governmental organisations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together.

Created in 1948, IUCN is now the world's largest and most diverse environmental network, harnessing the knowledge, resources and reach of more than 1,300 Member organisations and some 10,000 experts. It is a leading provider of conservation data, assessments and analysis. Its broad membership enables IUCN to fill the role of incubator and trusted repository of best practices, tools and international standards.

IUCN provides a neutral space in which diverse stakeholders including governments, NGOs, scientists, businesses, local communities, indigenous peoples organisations and others can work together to forge and implement solutions to environmental challenges and achieve sustainable development.

Working with many partners and supporters, IUCN implements a large and diverse portfolio of conservation projects worldwide. Combining the latest science with the traditional knowledge of local communities, these projects work to reverse habitat loss, restore ecosystems and improve people's well-being.

[www.iucn.org](http://www.iucn.org)

<https://twitter.com>

# Monitoring and assessment programme on plastic litter in Viet Nam shoreline

Report 2019

Greenhub, IUCN Viet Nam

The designation of geographical entities in this report, and the presentation of the materials, do not imply the expression of any opinion whatsoever on the part of The International Union for Conservation of Nature (IUCN), Center for Supporting Green Development (Greenhub), World Wild Fund for Nature (WWF), The Swedish International Development Cooperation Agency (Sida) and the U.S. Fish and Wildlife Service (U.S. FWS) concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The views expressed in this publication do not necessarily reflect those of IUCN, Greenhub, WWF, Sida or U.S. FWS or any other participating organizations.

This report has been made possible by funding from Sida and U.S.FWS.

The work has not been submitted to any other organization or journal for publication.

Published by: IUCN Viet Nam Country Office

Copyright: © 2021 IUCN, International Union for Conservation of Nature and Natural Resources

Reproduction of this report for educational or other non-commercial purposes is authorized without prior written permission from the copyright holder provided the source is fully acknowledged.

Reproduction of this report for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.

Citation: IUCN Viet Nam & Greenhub (2021). Monitoring and Assessment programme on plastic litter in Viet Nam shoreline – Report 2019. Hanoi, Viet Nam. IUCN: Viet Nam Country Office. 13pp.

Cover photo: Volunteers are classifying waste categories in Phu Quoc MPA © IUCN Viet Nam

Back Cover: Waste audit in Bai Tu Long National Park © IUCN Viet Nam

Layout by: Nguyen Thuy Anh

Produced by: IUCN Viet Nam Country Office

Available from:

IUCN Viet Nam Country Office  
1st Floor, 2A Building, Van Phuc Diplomatic Compound  
298 Kim Ma Street, Ba Dinh District  
Ha Noi city, Viet Nam  
[www.iucn.org/vietnam](http://www.iucn.org/vietnam)

IUCN Asia Regional Office  
63 Soi Prompong, Sukhumvit 39, Wattana 10110  
Bangkok, Thailand  
Tel: +66 2 662 4029  
[www.iucn.org/asia](http://www.iucn.org/asia)

<http://www.iucn.org/resources/publications>

## TABLE OF CONTENTS

<b>ABOUT IUCN .....</b>	<b>2</b>
<b>1. INTRODUCTION .....</b>	<b>6</b>
<b>2. METHODS AND STUDY SITES .....</b>	<b>7</b>
<b>3. RESULTS AND DISCUSSION .....</b>	<b>8</b>
1.1 Waste overview in Coastal.....	8
1.2 Composition of waste at the beach.....	10
1.3 Assess the pollution level of surveyed beaches .....	12
<b>4. CONCLUSION:.....</b>	<b>14</b>

## 1. Introduction

Plastic waste in the oceans is now one of the most serious environmental problems, and Vietnam is one of the countries with the highest amounts of plastic waste discharged into the sea. Among the 20 countries studied, the amount of plastic waste from Vietnam to the sea ranged from 0.28 to 0.73 million tons / year, equivalent to 6% of the total plastic waste to the sea and ranked 4th in the top 20 countries. Recognizing the serious risk of plastic waste to the environment, many initiatives, plans and regulatory documents have been issued. Many coastal provinces and cities also integrate pollution and disposal of marine plastic waste into local socio-economic development plans. However, in reality Vietnam does not have adequate national data characterizing plastic sources in the mainland or the sea and minimal quantitative research or statistics on the amount of plastic waste in coastal areas, including its sensitive Marine Protected Areas, which can be seriously affected by waste pollution.

Plastic marine debris is a global problem, but due to its widespread and patchy distribution, gathering sufficient samples for scientific research is challenging with limited time and human resources. Taking advantage of public interest in the impact of plastic on the marine environment, the Citizen Science (CS) initiative incorporates members of the public to provide public involvement in data collection in Vietnam.

Citizen science is regarded as the practice of engaging the public in a scientific project or research which produces reliable data and information usable by scientists, decision makers, or other stakeholders. The public can also contribute to science through crowd sourcing, a practice that typically involves large numbers of people in processing and analyzing data. The value of citizen science is discussed in relation to a range of projects of different types. For simplicity, 'value' is divided into scientific, educational, social and policy aspects.

Start in 2019, GreenHub and IUCN developed "Guidelines for Plastic pollution shoreline survey and monitoring and coastal plastic pollution" based on the guidelines of the National Oceanic and Atmospheric Administration (NOAA) and "Guidance on Survey and Monitoring of Marine Litter" of United Nations Environment Programme (UNEP), with adjustments to the concrete conditions in Vietnam.

This guide is used as a generic method document, applicable to all study sites to identify the results of plastic waste monitoring and assessment in the coastal for the Monitoring and Assessment programme on plastic litter in the coastal areas of Viet Nam. Objectives of this study were to a) Determining the composition and quantities of plastic waste and its origin; b) Recommending waste pollution hotspots for local authorities, and safe waste collection method in order to minimize adverse impacts on ecosystems and biodiversity during the cleanup event; c) Contributing to national policy recommendation based on scientifically based data collection; d) Using effectively the human and financial resources to minimize and prevent the impacts of marine waste; plastic pollution; e) Fundraising for conservation management activities which are associated with minimizing plastic pollution.

In Vietnam, we trained and supervision at 33 beaches in 11 Marine Protected Areas (MPAs), National Parks along the Vietnam coast. The program is expected to be implemented two time a year of over many years to create a reliable dataset of marine plastic waste in Vietnam.

## 2. Methods and study sites

The selection of survey beaches followed the criteria defined in “Guidelines for Plastic pollution shoreline survey and monitoring and coastal plastic pollution”. The beaches had to be composed of sand or gravel and exposed to the open sea; accessible to surveyors all year round; have a minimum length of at least several 100m; be free of buildings all year round and not subject to any other litter collection activities (beach cleaning or cleaning at least 3 months from the survey time); the beaches having fauna preservations like turtles, corals, bird migratory, marine animals, etc.

The survey methodology followed guidelines. Each marine protected area or national park will have 12 participants surveyed on the 100m beach stretches. At each selected beach, it will be divided equally into 20 equal parts, each with a width of 5m and perpendicular to the shore, numbered from 1 to 20 according to the length of the beach. Randomly select any 04 numbers to eliminate subjective and biased factors from the review. These four numbers correspond to four sections, each with a width of 5m and will collect plastic waste samples. The location of the four selected sections remained unchanged during all monitoring times. The exact location and stretch of beaches were documented using GPS.



**Fig. 1: Location of the study areas and examples of long-term monitoring beaches**

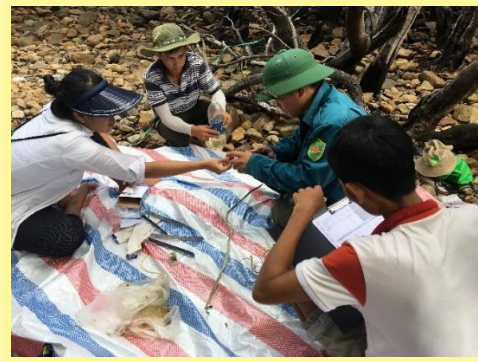
Once the four sections have been identified, the survey team will be divided into four sub-groups, each group of three members, each of which will conduct the survey at a assigned section. The steps to conduct survey of each section include: Take photo of transect covered the whole are between sea front and back of the beach; collect items belonged to the size class above 2.5cm (macro-litter) (Plastic, Glass, Metal, Rubber, Processed Lumber, Cloth/Fabric, Other), sorting each items follow into survey forms; counting and recording data include the number and weight of each type of waste on the indicated list.



**Fig. 2: Randomly select any 04 numbers for the 20 sections of 100m beach stretches**



**Fig. 3: Collecting waste in each section (4 Transect)**



**Fig.4: Sorting, counting and recording data**

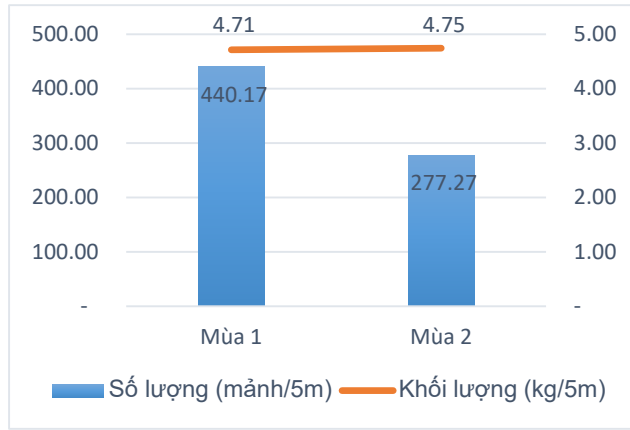
The data is admitted on excel file and statistical analysis to determine the composition, sources, weight and trend of change over time to serve the local waste management.

### 3. Results and Discussion

#### 1.1 Waste overview in Coastal

A total of 86,092 pieces in debris categories were collected from 10 locations in two season in 2019. Average amounts of debris on the survey beaches in number were 368,7 pieces/5m ( $\pm 475,7$  SD, ranges from 13 to 3168). 1135,046 kg debris were collected, Average amounts in weight were 4.729kg/transect ( $\pm 6,371$  SD, ranges from 0 to 56,99kg). On average, more than on the 100m beach stretches will have a waste of 7374 pieces and 94.58 kg.



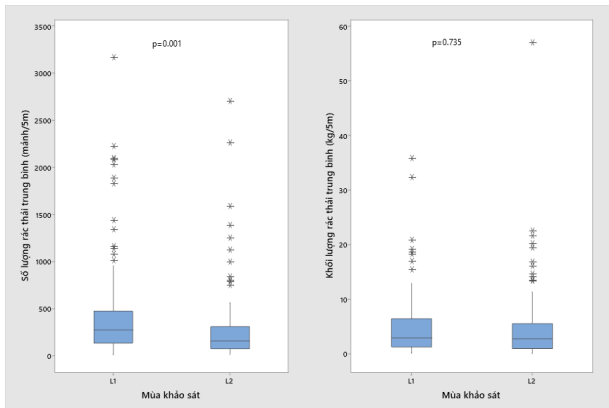


**Fig. 5: The average number and weight of debris on each transect follow by season.**

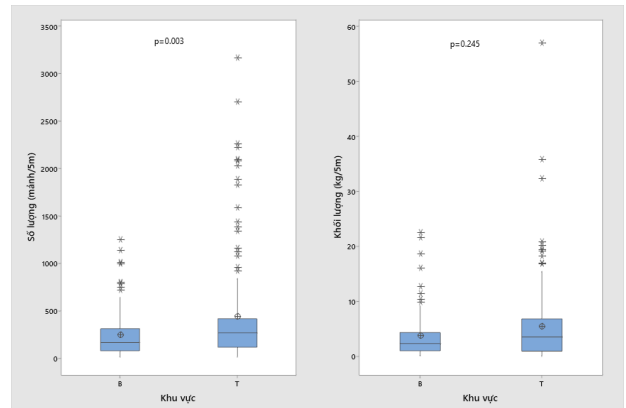
Follow the survey results in 2019, the amount and weight of waste varies follow by season, from north to south of Vietnam and from offshore and coastal islands, beach of inland. Specifically:

Number of pieces there is a large difference between season 1 (June 2019) and season 2 (December 2019), of which season 1 has a large number almost twice as much as season 2. However, the weight is similar in both seasons.

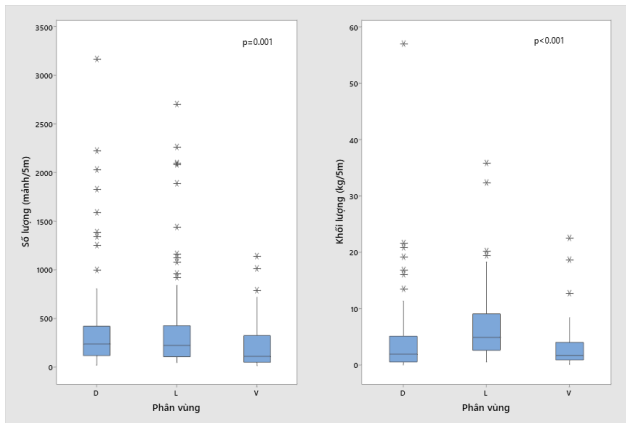
Vietnam's northern beaches such as Cat Ba, Bai Tu Long and Bach Long Vy have lower number and weight of waste than beaches and islands in the central region of Vietnam (Quang Tri, Cu Lao Cham, Ly Son, Nha Trang, ...). However, only the difference in number is statistically significant (Mann Whisley test,  $p = 0.003$ ). In terms of location, coastal islands have lower number and weight than offshore islands and inland areas.



**Fig. 6: Compare the average amount of waste in number and weight between seasons**

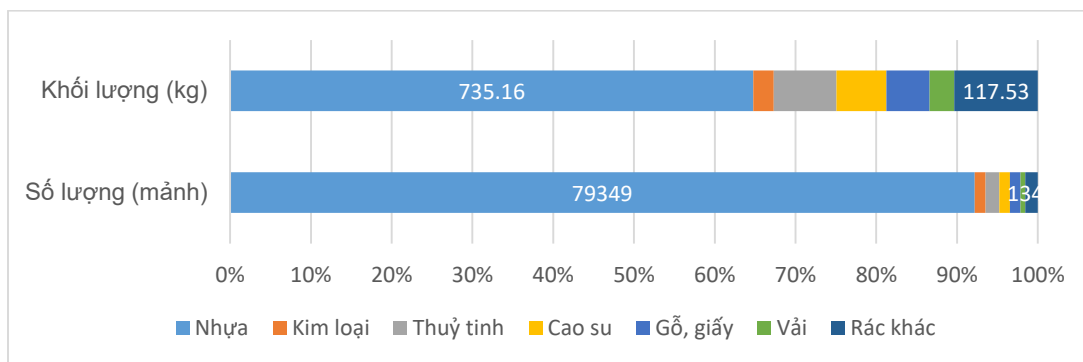


**Fig.7: Compare the average amount of waste in number and weight between sites.**



**Fig. 8: Compare the average amount of waste in number and weight between sites in offshore islands (D), coastal islands (V) và inland areas (L)**

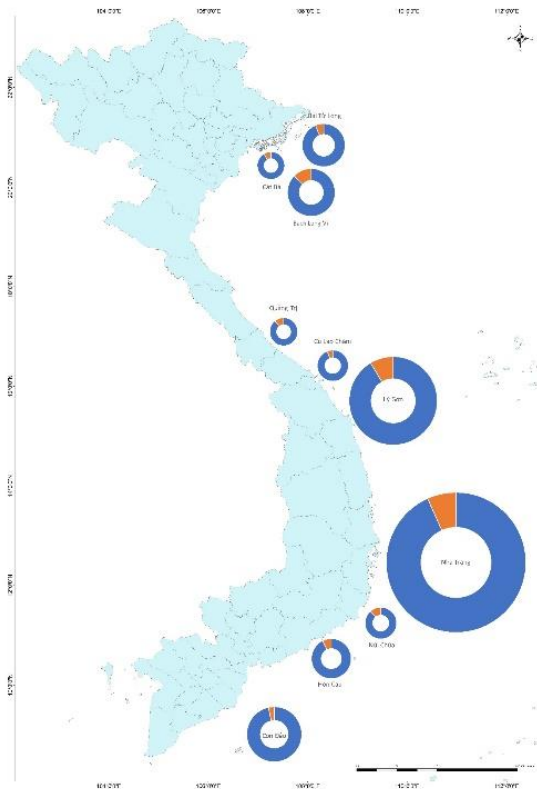
## 1.2 Composition of waste at the beach



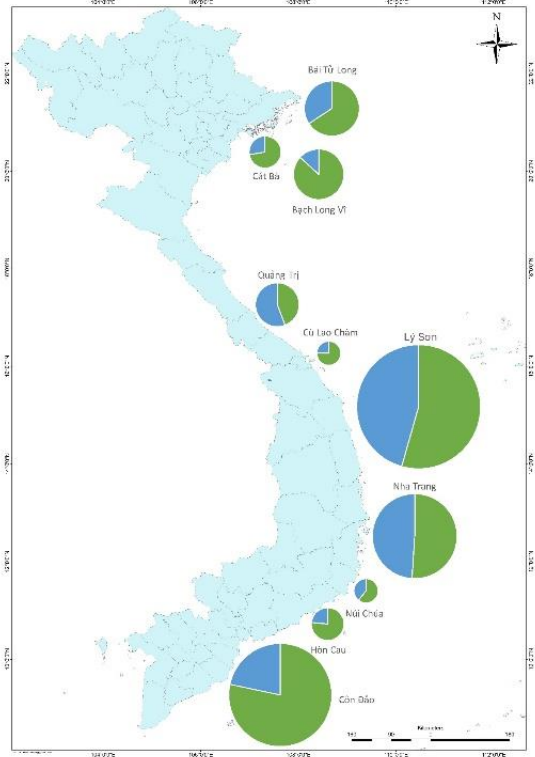
**Fig. 9: Rate of types of waste at the beach by number and weight**

The relative share of different item categories (Fig.9), shows that with 92,2% number and 64,8% weight of plastic, average of 6.612 pieces/100m. Number of other items: metals, glass, rubber, wood (machined), cloth and other waste is less but weight is high, especial is other waste only 1.6% of number but 10.4% of weight.

The number and weight of plastic waste also varies by geographic region and season. While the weight of plastic waste in season 1 in 2019 (June) and season 2 in 2019 (December) is similar, the number of plastic waste in season 1 is higher than that in season 2. About geographical, The Central region has a larger number of plastic waste than the North, especially in terms of location, the beaches on the Coastal Islands have lower number and weight of plastic waste than the beaches on the offshore islands and inland. This is statistically significant (Mann Whisley Test,  $p = 0.003$  and  $0.007$ ).

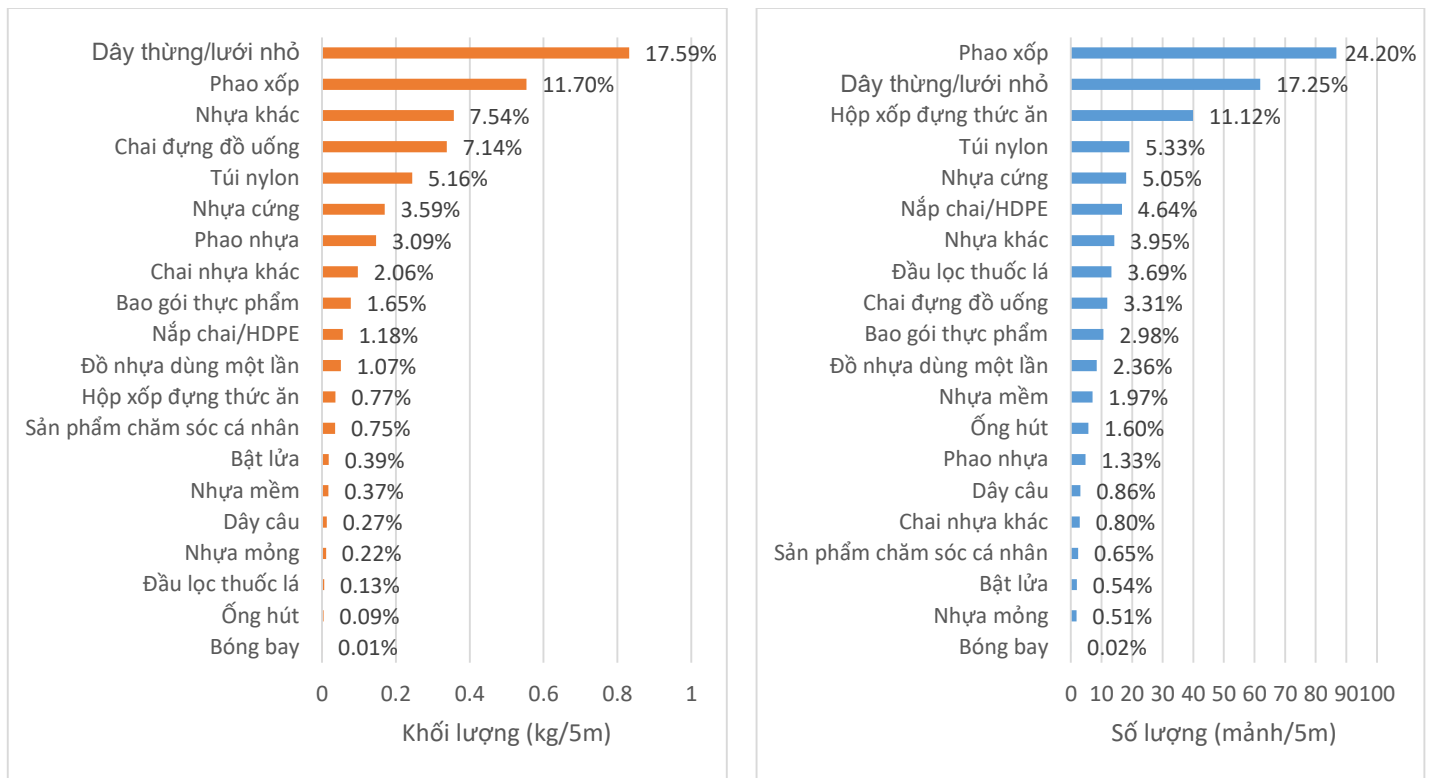


**Fig. 10: Comparison of rate of plastic waste at survey locations by number.**



**Fig. 11: Comparison of rate of plastic waste at survey locations by weight.**

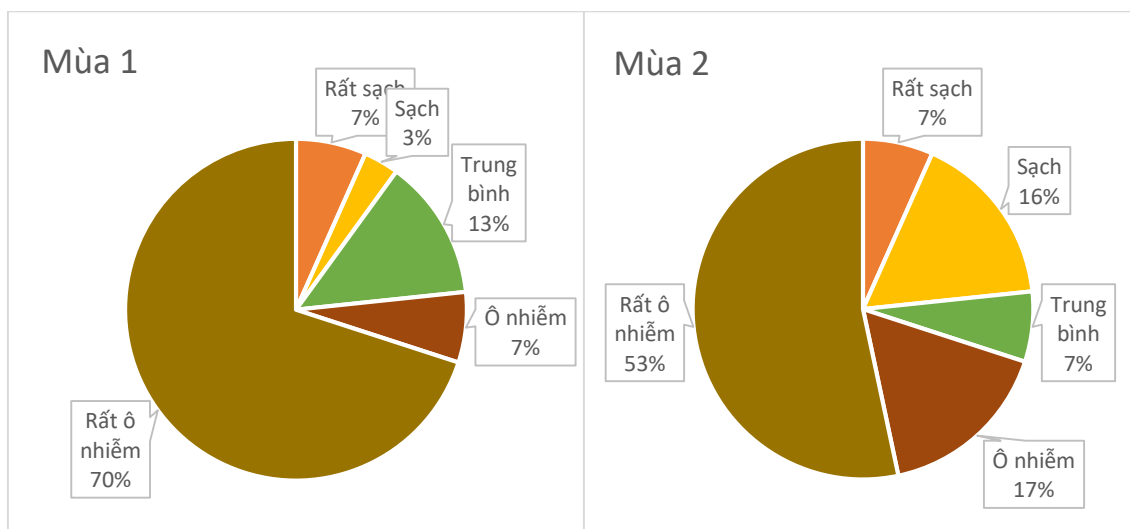
In plastic waste (18 items in catalog), most abundant are polystyrene (24.2% of number and 11.7% of weight) and rope/net plastic (17.25% of number and 17.59% of weight). In particular, the total number items originating from aquaculture or related to aquaculture (floats, small ropes, small plastic nets, plastic buoys and fishing lines) accounts for 47% of the number and 46% of the weight. Base on the results show that profession related to fishing, aquaculture and trading are the most polluting sources of waste, both in number and weight. However, current policies focus mainly on domestic waste sources (such as nylon bags, plastic bottles ...). Therefore, in-depth studies and larger spaces (on the water, in reefs, coral reefs, mangroves, etc.) are needed to more accurately identify the risks of this profession to the environment, especially waste pollution.



**Fig.1: Number, weight and rate of items of plastic waste to total number and weight of debris on beaches**

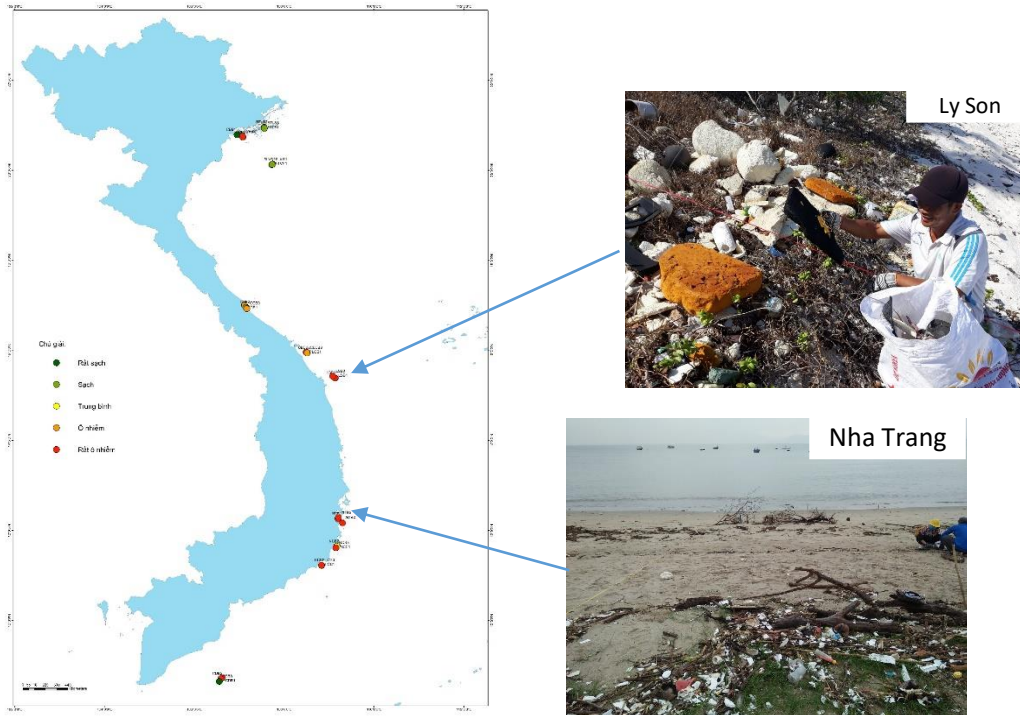
### 1.3 Assess the pollution level of surveyed beaches

After 2 times survey in 2019 at 30 beaches and 10 site of Vietnam, we use the Coastal Clean Index (CCI) to show that most off the beaches are extremely polluted with plastic debris. In the season 1, we assess 77% of the beaches are extremely polluted (CCI >20, 70%), polluted level (10 <CCI<20, 7%) and only 10% are clean and very clean. In the season 2, rate of pollution beaches has decreased but still reaches 70% (53% extremely polluted, 17% polluted), 23% beaches of clean and very clean. (Fig.13)

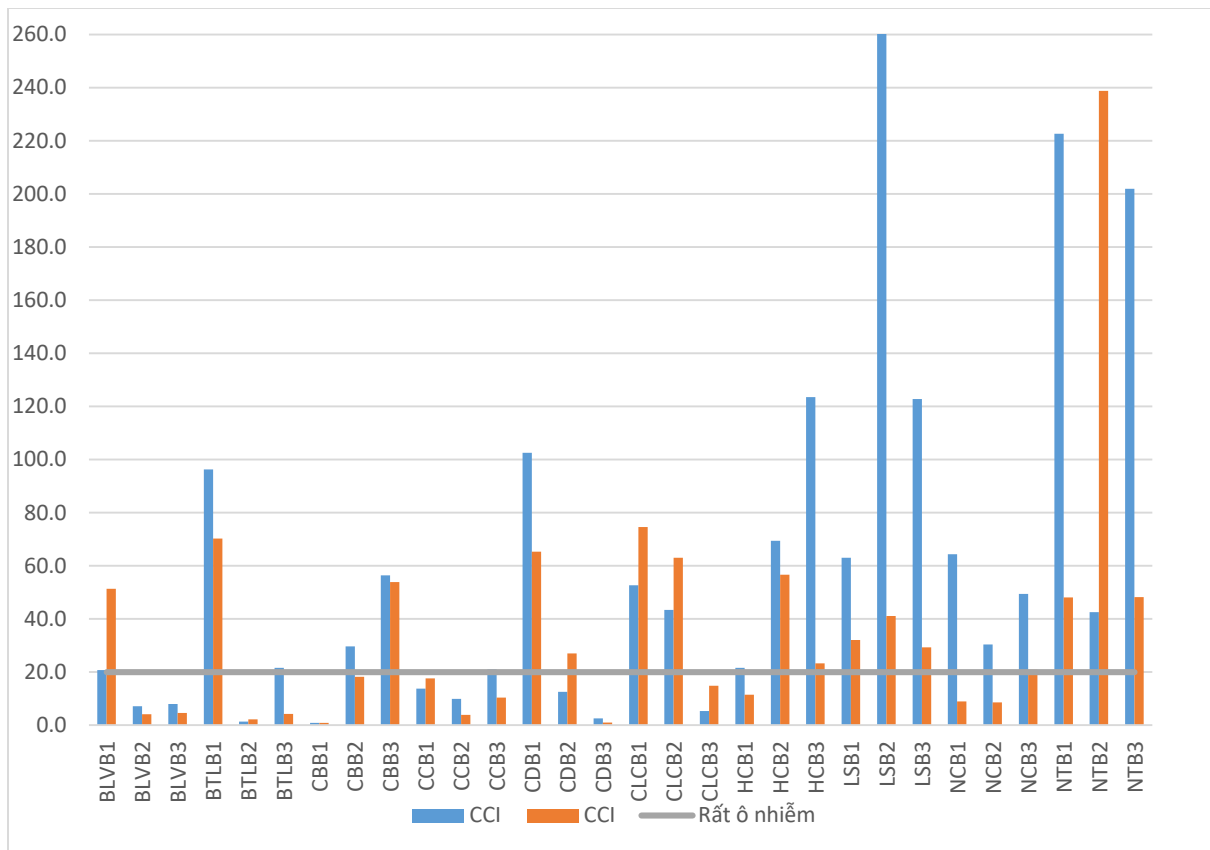


**Fig.13: The rate of quality of the surveyed beaches according to the CCI index**

Some beaches have plastic pollution are high level such as: Ly Son, Nha Trang with CCI > 120. Other beaches in site such as: Con Dao , Cu Lao Cham, Cat Ba, Hon Cau, Bai Tu Long, Bach Long Vy are polluted.



**Fig.14: Pollution levels of the surveyed beaches in season 2 (December, 2019)**



**Fig.15. Compare the quality of the survey sites with the CCI index.**

#### 4. Conclusion:

- Number and weight of debris on survey beaches are very high, Average 7374 pieces/100m and 94.58kg/100m
- Number of debris in season 1 (June 2019) is higher than number of debris in season 2 but weight of debris is similar.
- Number and weight of debris in the central region beaches (Including Con Dao) is higher than debris in the North region.
- Number of debris in the coastal islands on is lower than that in the offshore islands and on the inland. However, in terms of weight only the beaches of inland are the highest and have statistical significance.
- Plastic waste accounts for a large rate (92% of the number and 64.5% of the weight). In the composition of plastic waste, almost kinds of plastic waste related to fishery activities (Culturing, exploiting, trading, etc.), follow by single use plastic and other domestic waste.
- Number and weight of debris in beaches in Ly Son and Nha Trang are higher than that other sites.
- Assessment of the beach cleanliness index (Coastal Clean Index) shows that most of the beaches in the study areas are extremely polluted with plastic waste, with more than 70% of the beaches at extremely polluted level, clean and very clean beaches account for only 10% in season 1 and 23% in season 2.



IUCN Viet Nam Country Office  
1st Floor, 2A Building,  
Van Phuc Diplomatic Compound  
298 Kim Ma Street, Ba Dinh District,  
Hanoi city, Viet Nam  
Tel: ++(844) 37261575/6  
[www.iucn.org/asia](http://www.iucn.org/asia)

