

Status and programs to mitigate marine litter in Chungnam province

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Contents

1 Trends of marine litter issues

2 Damage by Marine litter

3 Marine litter monitoring

4 Establishment of sustainable management plan

1 Trends of marine litter issues

General coastal environment of Chungcheongnam-do

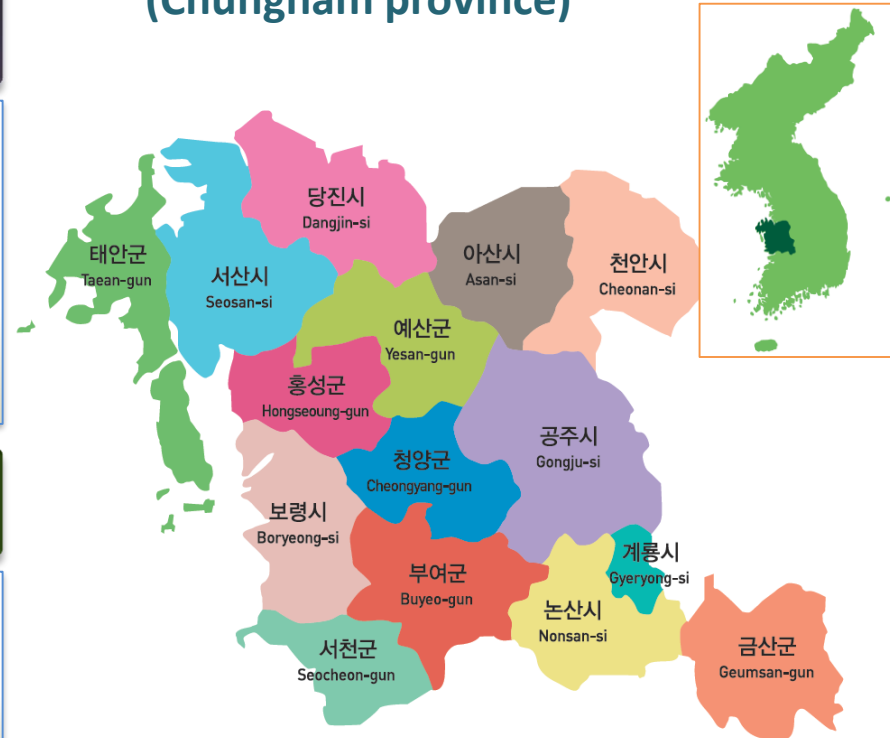
(Chungnam province)

Area: 8,213.4km² (15 cities)

- **Coastline:** 1,242km (Korea: 14,962km, 8.3%)
- **Mudflats:** 103 locations, 357km²
(Korea: 741 locations, 2,487km², 14.4%)
- **Islands:** 268 (inhabited: 33, uninhabited: 235)

Population: 2.12 million (2018)

- **Seven coastal cities and counties:** 974,365 people (2018)
- **Fishing population:** 8,162 households / 18,076 people



Abundant marine tourism resources and beautiful scenery

- **Mudflats on the western coast, Tae-an Maritime National Park, etc**
- **Exports of major marine products:** USD 60.096 million (seaweed, pen shells, salted seafood, etc.)
- **Ports, industrial complexes, tourist attractions, recreational facilities, and energy supply facilities (thermal power plants) are all located along the coast**

Changes in marine environment

Increased effects of climate change

- Temperature rose by approx. 0.89°C compared to 1901 → expected to increase by 2 to 5.2°C by 2100
 - Korea's sea level rose by approx. 8cm between 1964 and 2006 (4.3cm for the West Sea) → expected to rise by approx. 65cm by 2100
- ➔ Various issues have emerged, including: accelerated coastal erosion, increased frequency of abnormal weather conditions, greenhouse gas emissions trading scheme, and renewable portfolio standard

Change in paradigm of marine environment protection and conservation

- Increasing trend of international responsibility for marine environment conservation and restoration
- Change in paradigm from development to conservation and restoration
- Transition from post-management of marine litter to prevention and constant management

Growth of public interest in marine litter issue

- The issue of handling plastic waste has become an important social issue.
 - Increased interest in the effect of microplastics on people's health
- ➔ Increasing importance is being placed on establishing a systematic management plan and addressing these problems together as a global community.

Marine litter problem

Effects of marine litter

· Negative effects on the ecosystem

- ✓ The scope of damage is expanding from marine animals to the overall marine ecosystem.

· Economic losses

- ✓ Decreased production of marine products.
- ✓ Reduced social aesthetic value.

Marine litter has emerged as a global issue affecting the coexistence of humans and nature.

· Danger to human health and safety

- ✓ Microplastics can have a direct impact on people's health.

· Conflicts between countries

- ✓ Marine litter is now affecting countries and surrounding coasts.
- ✓ The affected areas are expanding steadily.



Marine litter problem

Increased inflow of plastic waste

- The use of plastic products is increasing.
- Also, the inflow of plastic waste into the ocean is increasing due to inadequate resource cycle management.
- The management necessary to prevent the inflow of land-based plastic waste into the ocean is lacking.
- There are blind spots, as it is unclear who should be responsible for handling onshore litter and marine litter (unidentified polluters).

Microplastics are one of the leading problems today.

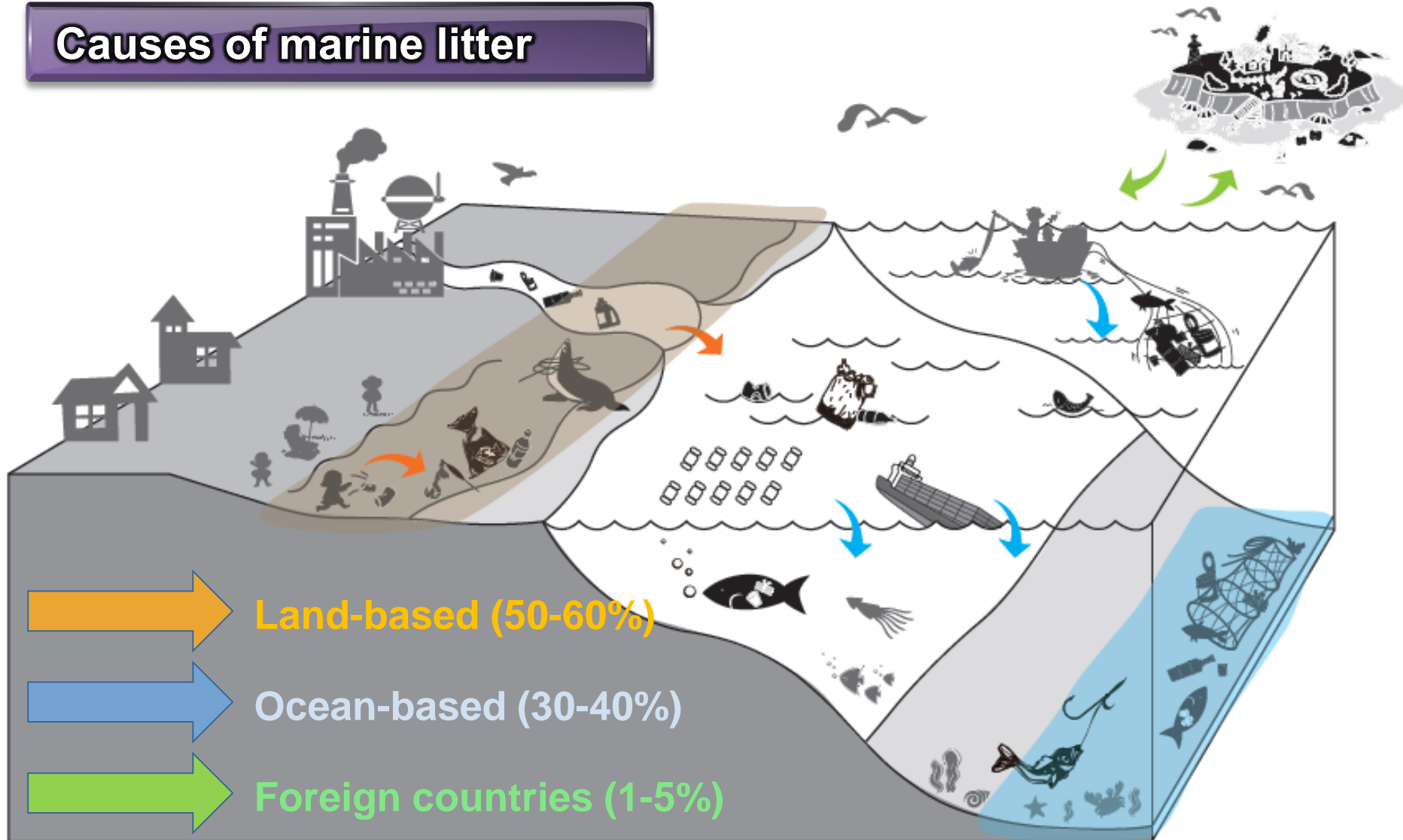
- Microplastics have been found inside anchovies, crabs, oysters, and other sea life.
- Microplastics have been detected in all levels of the food chain, from plankton to marine mammals.
- Microplastics have been detected in tap water samples from the United States and European and Asian countries.
- Microplastics have been detected in sea salt currently sold on the market.
- Microplastics have been detected in human feces.

2

Damage by Marine litter

Marine litter

Causes of marine litter



Marine litter

Yubudo Island,
ChungNam



Plastic resin pellets that washed ashore



3 Marine litter monitoring

Regional Marine litter monitoring

monitoring in Chungnam



- Locations: 60 (along the coast of Chungcheongnam-do)
- Purpose
 - Study the characteristics of coastal litter distribution in the province
- Method (six times a year since 2018)
 - Locations designated every 10km
 - Precise investigation of 100m-long sections for every location

- plastics (solid-type)
- plastics (bubble-type)
- food containers
- boxes
- baskets
- Styrofoam buoys
- PET bottles and bottle caps
- Wrapping bands
- Detergent containers and plastic films
- Cup noodle containers
- Styrofoam fragments

categorization



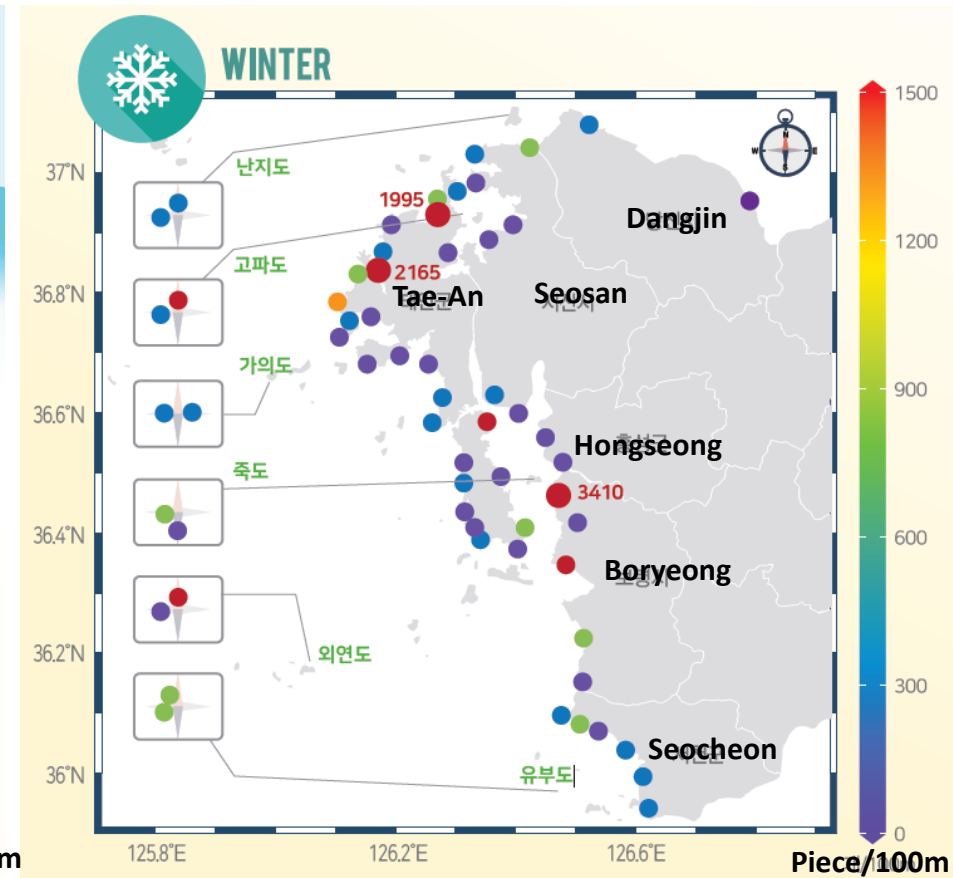
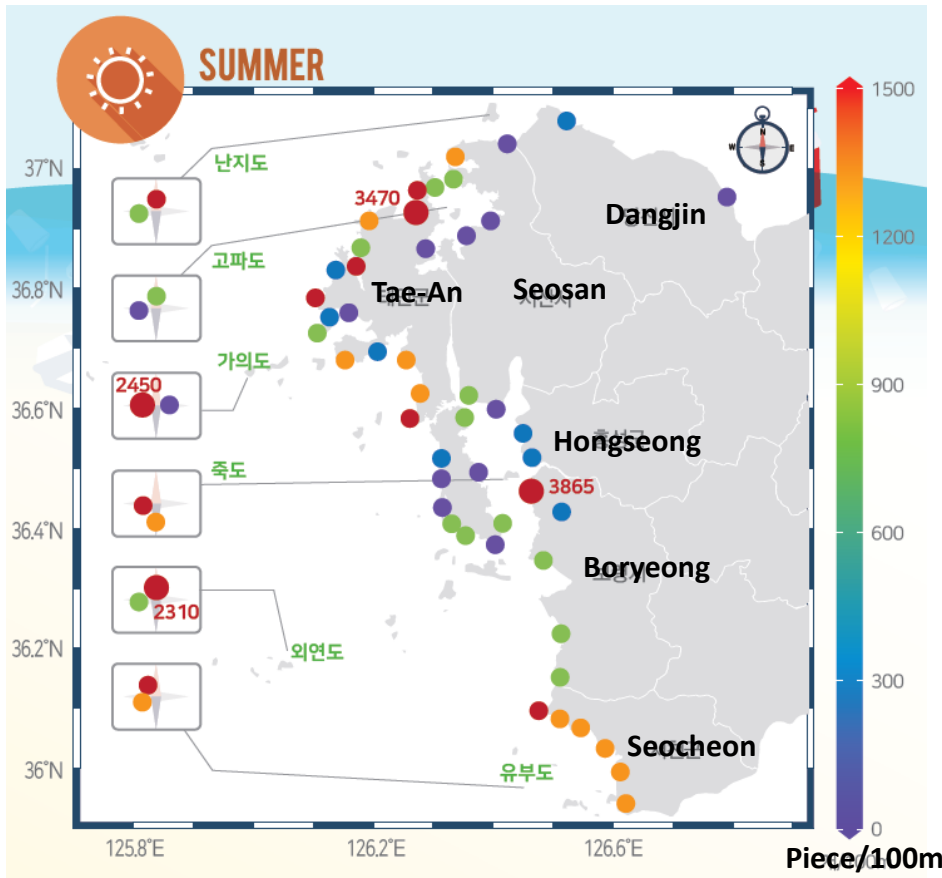
Weight measurement and categorization of material type

Precision investigation method
Study locations every 10 km

Regional Marine litter monitoring

Results

- Summer > Winter
- Much spotted in Tae-An & Seocheon
- Concentrated on islands



Plastic and styrofoam are the main items.

Regional Marine litter monitoring

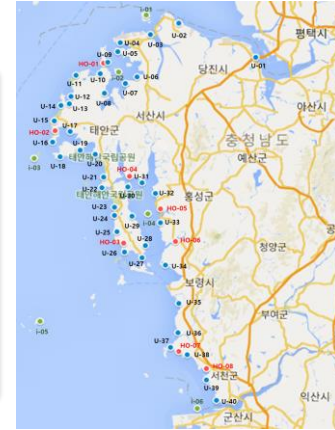
main items : Plastic and Styrofoam

- number : Plastic 61%, Styrofoam 20%
- weight : Plastic 36%, Styrofoam 36%

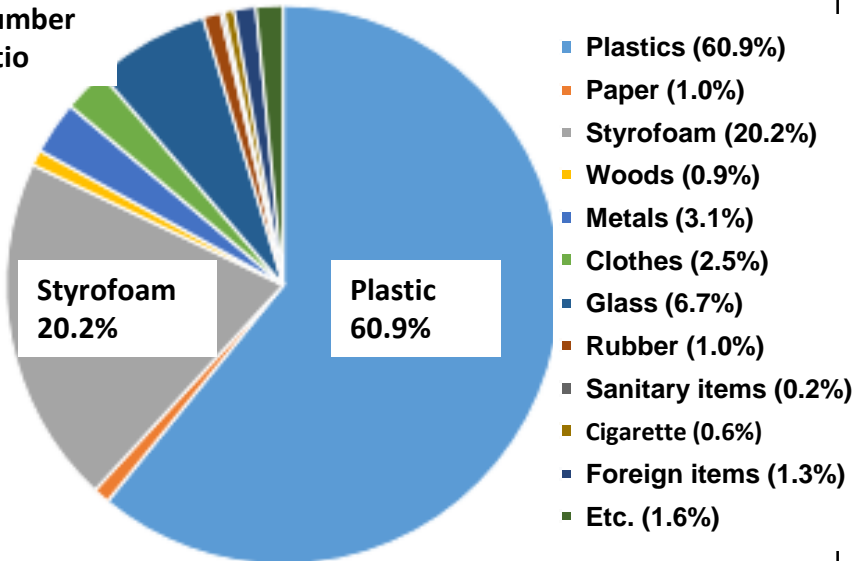
A lot of bulky Styrofoam is detected

Weight per Volume ratio(kg/L)

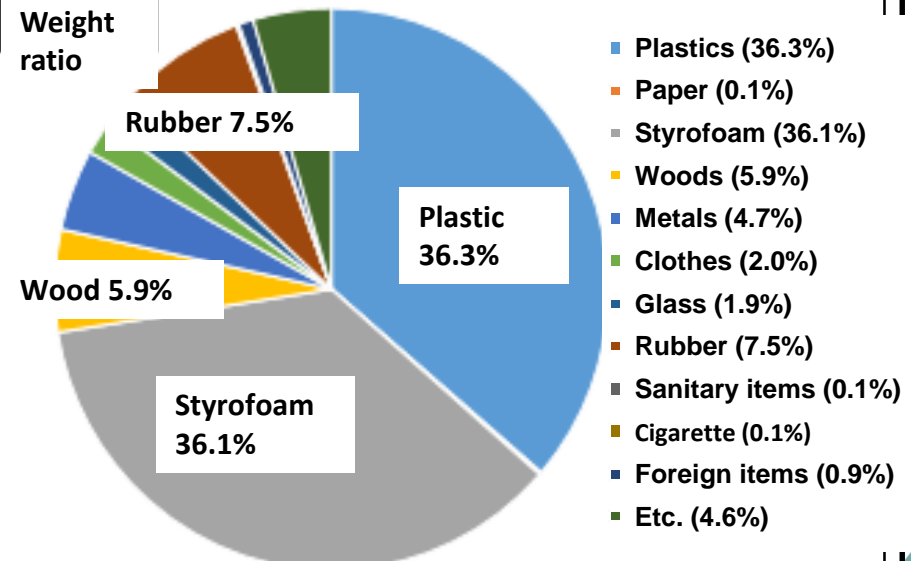
- **20% lower than national average**
- Chungnam : 0.154
- (Korea average : 0.192)



Number ratio



Weight ratio



4

Establishment of sustainable management plan

Establishment of comprehensive measures for marine litter in Chungcheongnam-do

Vision and Goals

region-led response to marine litter

Creation of new value by keeping the marine environment healthy and clean

Goals

- Minimize marine litter through prevention and integrated management
- Establish a prompt and systematic marine litter response system

Four measures

Prevention

- Propose guidelines, such as action plans to reduce marine litter
- Analyze marine pollution monitoring and come up with systematic improvement measures
- Prevent land-based litter from flowing into the ocean
- Increase people's environmental awareness

Collection

- Promote special measures for inhabited islands
- Operate an integrated management center (storing, sorting and selection)
- Modernize garbage collection and transport equipment

Reduction

- Develop resources using sorted recyclable products
- Supply Styrofoam compacter
- Introduce a volume rate system for people who discard fishing litter

Treatment

- Increase preprocessing facilities for desalination and compression
- Increase and supply on-board and/or portable depositories
- Install exclusive treatment facility

Promotion strategy

(Coastal litter)



- Expanded management infrastructure: increase collection personnel and modernize equipment

(Fishery litter)



- Increased accountability of polluters: introduce a volume rate system for fishery litter

(Deposited litter)



- International response: establish regional response centers around the Korean coasts

(Island litter)



- Integrated management: unify land-based and marine litter management authorities

◆ Establish integrated improvement measures to resolve environmental issues related to marine litter originating from land, sea, and estuary.

⇒ Expected to minimize marine litter through prevention and systematic integrated management

Establishment of sustainable management plan (since 2015)

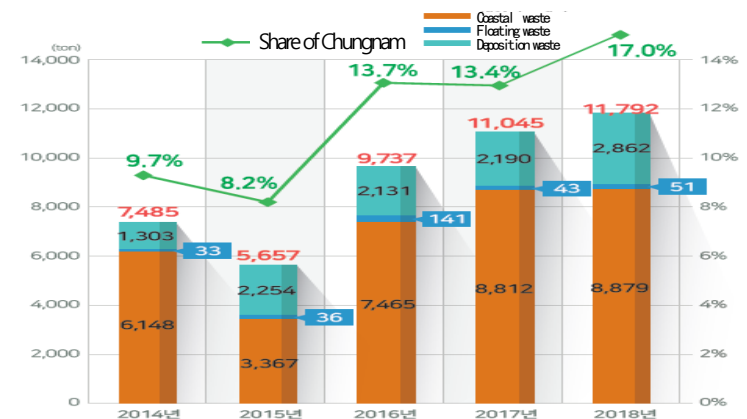
- Since the establishment of the **Comprehensive Measures for Clean Marine Environment** in 2015, Chungcheongnam-do has been discovering new projects and supplementing existing projects every year.
 - In 2018, KRW 18.8 billion was invested in 43 projects (marine litter collection and treatment, building infrastructure, etc.).

Performance of litter collection projects

- Although the amount of litter collected through marine litter collection projects and other litter collection and treatment projects is **increasing rapidly, the amounts collected fall below the amounts created (14,600 tons)**.
 - Every year, Chungcheongnam-do invests an average of KRW 4.5 billion in litter collection and treatment and collects 9,000 tons of marine litter (second largest in Korea).

Category	Amount of marine litter collected					Rate of increase ('2016→'2017)
	Average	2015	2016	2017	2018	
Korea	79,445	69,129	70,841	82,175	69,384	16% ↑
Chungnam	9,558	5,657	9,737	11,045	11,972	4% ↑
Share of Chungnam	13%	8%	14%	13%	17%	-

Trend of marine litter collection in Chungcheongnam-do over past five years



Conclusion

What do we need to do to clean up marine litter in local areas?

region-led response to marine litter

Preparations for cleaning up coastal areas

Consider efficient distribution and practical use of resources

Monitoring and assessment

Consider priorities of marine litter treatment

Consideration of preventive measures

Make decisions through regional consensus and strengthen education and promotion

Even our smallest acts and concerns can help make our oceans healthier and fishing towns more vibrant.



Thank you !!!