



Marine environmental pollution from plastic waste in Quang Binh province, Vietnam: Current situation and solutions

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ABSTRACT

With an area of 71% of the Earth's surface, seas and oceans are truly the cradle of human life. However, the greater the role of seas and oceans, the greater the value and benefits that countries receive from seas and oceans, which means that seas and oceans are suffering from pollution that is increasing in severity, and one of the causes is pollution caused by plastic waste. As one of Vietnam's 28 coastal provinces with many fishing ports and beautiful beaches, Quang Binh Province is facing many challenges brought about by marine environmental pollution from plastic waste. This article will focus on an overview of marine environmental pollution from plastic waste in Quang Binh Province, Vietnam, identifying sources of plastic waste, causes of marine pollution from plastic waste, and harmful effects of marine environmental pollution from plastic waste; analyzing the efforts of Quang Binh Province, Vietnam, in preventing marine environmental pollution from plastic waste; and thereby proposing a number of solutions to improve the effectiveness of preventing marine environmental pollution in this locality. Articles using secondary data are books, articles, reports, statutes, domestic and international laws, etc.

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1. Introduction.

Plastic is a commonly used product in Vietnam and countries around the world because of its low price, ease of use, durability, and ability to resist both physical and chemical degradation (Geyer et al, 2017). However, plastic has become a great danger to countries, including Vietnam. Due to its ability to spread from land and sea and between marine areas, as well as its long-term survival in the natural environment, plastic waste has caused serious consequences for human health, the marine environmental landscape (Isobe, 2015), marine biodiversity (Wilcox et al, 2018), and the socioeconomic development of countries.

For this reason, research into the problem of preventing marine pollution from plastic waste has received widespread attention from researchers at home and internationally. Current studies, however, focus on the prevention of marine environmental pollution at the national level rather than at specific locations. Meanwhile, the prevention of marine environmental pollution from plastic waste can only be effectively implemented when carried out synchronously from the central to the local level. Therefore, research on the prevention of marine pollution from plastic waste in a specific location is essential.

Within the scope of this article, the authors chose the province of Quang Binh as the subject of study. As one of Vietnam's 28 coastal provinces with the Donghai Seafood Market and many of Quang Binh's prominent tourist beaches (such as Nhat Le Beach, Shipping Village, Ocean Sea Village, Jumping Beach, Saigon Beach, and Quang Phu Beach), Quang Binh has soon become aware of the harmful impact of marine environmental pollution caused by plastic waste and has put forward a number of initiatives and policies aimed at addressing the problem of polluting the sea environment from plastic waste. Implementing this initiative, the province has mobilized the broad

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involvement of local governments, organizations, and people to work together to counter the pollution of the marine environment from plastic waste.

By clarifying an overview of the state of marine environmental pollution from plastic waste and the efforts of Quang Binh Province, Vietnam, the article proposes a number of solutions to enhance the effectiveness of the prevention of maritime environmental contamination by plastic waste in Guangdong Province. The research results of the article will provide an additional legal and practical basis for supplementing and perfecting the policies and laws of the province of Quang Binh in particular and Vietnam in general related to this issue. At the same time, this is also a valuable lesson of experience for the countries of the world to study and use.

2. Methodology.

In this paper, the authors used a combination of different research methods, such as collection, documentation, table study, analysis, synthesis, and statistical methods. In this, the method of collecting and processing documents is used to collect and compile national and international references to obtain information to implement the research content of the article. The on-the-board research methodology is used to conduct preliminary assessments, finding information available in statistics, policy texts, laws, books, newspapers, journals, and agencies and organizations related to the overview of marine environmental pollution caused by plastic waste in general and in the province of Quang Binh. The statistical method is used to provide data on the state of marine environmental pollution caused by plastic waste in the province of Quang Binh. The analytical and synthetic methods used to explain the state of marine pollution from plastic waste in Quang Binh Province and the efforts of Guangdong Province in the fight against marine contamination from plastic litter. For objective assessments based on clear scientific foundations, the authors used an interdisciplinary approach in the legal and social sciences to address the research content of the paper.

3. Results and Discussion.

3.1. The current situation of marine environmental pollution from plastic waste in Quang Binh Province, Vietnam.

3.1.1. Overview.

Plastic waste is a type of solid waste used to refer to products made of used or unused plastic that are disposed of. Plastic waste includes plastic bags, plastic bottles, plastic cups, plastic suction tubes, old plastic toys, etc. These products have long degradation times, which can be hundreds or thousands of years.

Plastic waste pollution is now a dangerous threat to both the environment and human health. According to a United Nations report, the world discharges approximately 300 million tons of plastic waste every year, of which approximately 11 million tons escape into the ocean, enough to circle the earth four times. By 2050, the amount of plastic litter in the oceans

will be greater than that of fish, with devastating effects on humans and the planet. In Vietnam, an estimated 1.8 million tons of plastic waste are released into the environment every year.

In the province of Quang Binh, the total amount of waste generated in the entire province is approximately 500 tons per day, of which 35% comes from urban areas and 65% from rural areas. According to the Fisheries Division, fishermen in Quang Binh annually release approximately 120 tons of plastic waste and degradable nylon bags into the ocean. According to the results of the survey of the state of plastic waste in the coastal areas of Quang Binh Province in 2019, the Department of Marine and Marine Islands, Department of Resources and Environment, Guangdong Province, on average, each coastal area uses 4–8 plastic bags per day, corresponding to an environmental emission rate of 3–7 plastic bags per day (equivalent to 90–210 plastic bags per month). With a total of 15,165 households, coastal areas discharge an average of 135,000 plastic bags per day, not to mention other single-use plastic products. This is especially true for the local people with a fairly high standard of living, such as Canh Duong, Hai Trach, Thanh Trach, Trung Trach, Bao Ninh, and Hai Thanh. The percentage of people discharging hard-to-decompose leather bags into the environment is increasing, and the rate of reuse is very low. Populated areas with limited livelihoods include Quang Dong, Quang Xuan, Duc Trach, Ngu Thuy Bac, Ngu Thuy Trung, and Ngu Thuy Nam. The percentage of people discharging hard-to-decompose plastic bags into the environment is lower, and the rate of reuse is higher (Thieu, 2020).

The main reasons why leather bags are widely used in the residential community are as follows: The convenience, variety in size, small, compact; leather bag is low in price and is almost free of charge when buying goods; environmentally friendly bags are often expensive, not popular, not convenient to buy and use; the price is high, so people have not paid attention to forming habits of use.

Currently, many localities in Quang Binh Province thrive in trade, tourism, and services associated with the Nhat Le beach, including hotels, restaurants, cafés, shopping centers, many historical sites, cultural centers, fishing ports, and fish markets. This means that large amounts of plastic waste are generated on a daily basis, posing challenges to local levels and industries in preserving and protecting the marine environment linked to the development of trade, tourism, and marine services. If state management, public propaganda, and garbage collection are not good, the source of waste will spill into the general environment and into the Nhat Le Sea through the Nhat Le River.

3.1.2. Sources and causes of plastic waste in Quang Binh Province, Vietnam.

Plastic waste in Quang Binh Province, Vietnam, is formed from many different sources, including human activities in life and production activities, typically the following:

i) Plastic waste from residential settlements: Every day, people's activities use a variety of plastic products, such as plastic cups, suction tubes, nylon bags, fast food box covers, suckers, plastic glasses, etc. They are collectively referred to as

disposable plastic waste. This is a common source, mainly in the province of Quang Binh today.

ii) Plastic waste from tourist sites, services, recreational centers or schools, business, or commercial (Dong Hoi market, Vincom shopping center, Coopmart, floating restaurant system near Long Dong Bridge, etc.) is also a common source and mainly in the area today.

(iii) Plastic waste from medical operations: Medical products are always used once in a lifetime to ensure hygiene and prevent the spread of diseases. Therefore, plastic waste from medical activity is a significant amount every day.

(iv) Plastic waste from industrial activities: In addition to living, medical, tourism, etc., the amount of waste that comes from industrial activity also accounts for a high proportion. This kind of garbage originates from production activities, the livelihoods of workers, etc (Communist Party of Vietnam, 2022).

There are many causes of marine pollution from plastic waste, including three main causes:

First, individual consciousness is not high. Many people have the habit of abusing one-time-use plastics such as cups, spoons, and plastic bowls in an innocent, uncontrolled way. Many people throw waste from the road to the coast, to the sewers, to the canyons, making it widespread, difficult to collect, and difficult to dispose of. The majority of people today still throw plastic waste with other types of inorganic waste, not conscious of the sorting of the waste at the source, making the process of sorting and handling very difficult.

Second, there are limited facilities for sorting, collecting, and handling plastic waste locally. Currently, the equipment for new garbage classifiers is only strongly deployed in areas with a thriving tourism industry, such as Nhat Le Beach and Walking Street in Dong Hoi City, Quang Binh Province, which have not been seen in other locations. Collecting and handling plastic waste is unavailable due to outdated equipment.

Third, sanctioning the behavior of polluting the marine environment with unclear plastic waste and a lack of deterrence does not criminalize this violation as a separate offense.

Fourth, local government intervention is sometimes limited. Although pollution of the marine environment from plastic waste occurs in many places, local authorities have not been strong enough to address this problem.

3.1.3. *Impact of marine environmental pollution from plastic waste in Quang Binh Province, Vietnam.*

Plastic waste has a very long time of degradation; for example, plastic bags have a biodegradation time of 10 to 20 years; single-use diapers have a biologically degraded time of 50 to 100 years; and plastic bottles have a biodegradable time of 100 years (Minh, 2023).

First, it is harmful to human health.

Coloured nylon bags often contain metals such as lead and cadmium. The use of nylon bags containing hot food produces many toxins in the body (CIEL, 2019). The degradation of some kinds of plastic waste produces substances that are harmful to human health (Zheng & Suh, 2019). Plastic contains toxic DOP that can cause many dangers to fetuses and young children. According to Associate Professors. Doctor. Nguyen

Duy Thong, Institute of Biotechnology and Food, Bach Faculty University of Hanoi, “many poor-quality plastic products in the process of use will produce BPA as a toxic substance, causing dangerous diseases in humans such as infertility, diabetes, and cancer (Nhien, 2021).

The results show that an adult can eat up to 52,000 microplastics per year. This damage to tissues in the body causes immune responses such as coughing and allergies, disrupts metabolism and the endocrine system, causes hormonal imbalances, affects the structure of the brain, respiration, digestion, and miscarriage, weakens the immune system, and even causes cancer.

Plastic waste pollutes water and air and affects the growth and development of animals and plants, thereby affecting human health through diet and air.

Plastic waste can melt at 70 to 800 degrees C. Melt into food and then enter the human body, accumulating and causing dangerous diseases (Garcia et al, 2019).

Second, damage to the environment and animals.

Plastic waste alters the physical, biological, and chemical properties of the water source, turns the soil silvery, makes soil “inorganic” and affects crops. Plastic waste blocks drainage, causes floods, and seriously affects the environment (Beaumont et al, 2019). In addition, plastic waste floating in the ocean eats or plagues marine life, affecting life. Statistics from the “Information and Environmental Protection Network” show that 1.5 million marine animals die each year from plastic poisoning. Nearly 700 species, including endangered ones, have been affected by plastics; 81 of the 123 marine mammals are known to have eaten or stuck in plastics. It destroys cells, affects the digestive system, or blocks the veins, causing suffocation. Scientists studied and found approximately 2.1 pieces of microplastics in each fish.

Third, damage to marine biodiversity.

Vietnam’s marine biodiversity has lost 12% of its coral reefs, and 48% of the rest are in severe degradation. Coral reef processing is caused by plastic cutting, microplastic absorption, plastic poisoning, and being dragged down by fishing gear. This has reduced the biodiversity, ecology, and quality of the marine environment (Costanza et al, 2014).

Fourth, harm to the economy and society.

Pollution of the marine environment from plastic waste in Quang Binh Province, Vietnam, has left many serious consequences for local economic and social development. Because pollution of the marine environment from plastic waste diminishes the beauty of marine landscapes, decreases the attractiveness of Vietnamese tourism, reduces the number of tourists arriving in Vietnamese seas, decreases the competitiveness of Vietnam tourism, affects neighboring waters in the region, and affects the goals of sustainable tourism development, plastic waste in the ocean is causing income losses to coastal industries and people. From the impact on marine tourism, pollution of the marine environment by plastic waste means a reduction in income and employment for the tourism industry, adding costs to cleaning off marine waste to ensure and maintain the attractiveness and safety of the beach for users. In addition, the pollution of the marine environment from plastic waste also causes economic instability in agricultural production and fish-

ery exploitation due to reduced fishery resources and decreased merchandise value, forcing people to pay extra costs for fishing boats, waste cleaning, net repairs, and boats. According to calculations by Dalberg Advisors and the International Organization for the Conservation of Nature (WWF), the cost of plastics to the environment and society is at least 10 times higher than the market price that primary plastics producers pay, with significant costs incurred by countries. The cost of greenhouse gas emissions from the entire life cycle of plastics is over \$171 billion. The cost of managing plastic waste is more than \$32 billion. The cost of dealing with the degradation of ecosystem services is \$3.1 trillion (+/- \$1 billion). The cost of cleaning plastic in the environment has not been calculated. The social cost of the life cycle of primary plastics expected to be produced by 2040 (excluding market prices) is equivalent to approximately 85% of global spending on health in 2018 (Worldwide Fund For Nature, 2021).

3.2. *The efforts of Quang Binh Province, Vietnam, in preventing marine environmental pollution from plastic waste.*

In view of the plight of marine environmental pollution from plastic waste and the negative effects of this problem, Quang Binh Province, Vietnam, has made many efforts to prevent marine pollution from plastic litter. This is expressed specifically in the following aspects:

First, actively promulgate the policies and laws of the province of Quang Binh to specify the policies, laws, and policies of the state in Central China on the prevention of pollution of the marine environment from plastic waste.

In addition to the policy texts and general laws issued by the state, the province of Quang Binh also issued a number of separate regulations to specify the policies. This law is intended to adapt to the practical situation of the local context:

(i) Documents issued by the People's Committee of Quang Binh Province and related agencies: Official Letter No. 2210 / UBND-TNMT dated December 26, 2018 of the Provincial People's Committee issued on the organization of the launch of the movement against plastic waste in the Quang Binh province; Plan No. 1260/KH-UBND dated July 30, 2019 on the implementation of the "Combating Plastics Waste" movement in Quang Binh province. On October 8, 2019, the Standing Committee of the Provincial Commission issued Directive No. 35-CT/TU on strengthening Party leadership in the management and disposal of solid waste in the province. Subsequently, the Department of Science and Technology proposed Plan 398/KH-SKHCN on August 14, 2019 Implementation of the "Combat Plastic Waste" movement; the Department of Justice proposed Plan No. 1841/KH-STP on August 12, 2019 to implement the "Combat Plastic waste" movement of the Quang Binh Judicial Department; The Department of Finance proposed Plan No. 2542/KH/STC on August 12, 2019 to implement the movement "Combating Plastic Waste"; The People's Committee of the Township proposed Plan No. 737/KH-UBND on August 2, 2019 to implement the movement "Contra Plastic Waste" in the town area; Decision 1996/QD-UBND dated June 16, 2020 approving the project "Quang Binh women with the movement against plastic waste in the period of 2020-2022"; Directive No.

16/CT-UBND dated 23/9/2020 on strengthening the management and reduction of plastic waste in Quang Binh province; Plan No. 38/KH-BCD dated 16/3/2021 of the Steering Committee on the implementation of the strategy for sustainable development of the marine economy of Vietnam in the period of 2021-2015 in Quang Binh province; Plan No. 1553/KH-UBND dated 16/8/2021 on the implementation of the "Project on strengthening the management of plastic waste in Vietnam" in Quang Binh province"; Plan 773/KH-UBND dated 14/5/2021 on the implementation of the project "Promoting propaganda on plastic waste prevention and control in the period of 2021-2025 in Quang Binh province"; Action Plan No. 1237/KH-UBND of the People's Committee of Quang Binh province dated 11/7/20-22 on ocean plastic waste management in Quang Binh province until 2030; Official Letter No. 817/UBND-KT of the People's Committee of Quang Binh province dated April 28, 2023 to the Ministry of Natural Resources and Environment on reporting on the implementation of the national action plan on ocean plastic waste management to 2030 in Quang Binh province; Directive No. 11/CT-UBND dated September 7, 2023 of the Chairperson of the People's Committee of Quang Binh province on strengthening the state management of environmental protection in Quang Binh province (Cuong, 2023).

(ii) Documents issued by local authorities in the province of Quang Binh: Plan No. 380/KH-UBND of the People's Committee of the City of Donghoi on August 13, 2019 to implement the movement "Combat Plastic Waste" on the site of the city of DongHoi; Official Letter No. 1973/UBND-TNMT of the People's Committee of Donghoi City dated July 6, 2021 on strengthening environmental sanitation at Donghoi Market, Plan No. 737/KH-UBND dated August 2, 2019 by the People's Committee of the Ba Don Towns proposed the implementation of the movement "Anti-Plastic Waste" in the township; Plan No. 14/KH- UBND Quang Phong Ward's People's Committee of 07/08/2019 on the organization of sanitary cleaning of neighboring streets and waste collection in residential areas; Plan No. 17/KH-UBND on October 2, 2019 to the Quang Phong Ward's People's Committee on the implementation of the launch of the movement "Anti- Plastic Waste" on the local; Official Letter No. 695/UBND-TNMT of the People's Committee of Dong Hoi City on May 16, 2022; Plan 31/KH-UBND dated 10th March, 2023 of the People's Committee of Donghai Ward on the inspection of environment protection of business facilities and services on the ground in 2023; Official Letter No. 85/UBND dated April 21, 2023 by the People's Committee of Donghai Ward to launch the environmental sanitation work of the Urban Civilization Month and the Dong Hoi Cultural Week in 2023; Official Letter No. 126/UBND dated 06/06/2023 on the organization of activities in honor of World Environment Day (05/6), World Ocean Day (08/6), Environmental Action Month 2023; ...

Second, the widespread involvement of local agencies, departments, associations, and people involved in the prevention of plastic waste at sea should be mobilized.

The prevention of marine environmental pollution from plastic waste in the province of Quang Binh is carried out in a synchronous manner, from central to local. In response to the

“Combat Plastic Waste” movement launched by the Ministry of Resources and Environment in accordance with Public Letter 5539/BTNMT-TCMT dated October 10, 2018, the People’s Committee of Quang Binh Province issued Public Letter No. 2210/UBND-TNMT dated December 26, 2018 on the organization of the launch of the movement against plastic waste in the province; Plan No. 1260/KH-UBND dated July 30, 2019 to implement the movement “Contra Plastic Waste” in Quangdong Province. Subsequently, the Department of Science and Technology proposed Plan 398/KH-SKHCN on August 14, 2019 to carry out the “Combat Plastic Waste” movement; the Department of Justice proposed Plan No. 1841/KH-STP on August 12, 2019 to implement the “Combat Plastic Waste” movement; the Department of Finance proposed Plan No. 2542/KKH/STC on August 12, 2019 to carry out the movement “Combat Plastic Waste”; and the People’s Committee of Ba Don Town proposed Plan No. 737/Kh-UBND on August 2, 2019 to conduct the “Control Plastic Waste” movement on the municipal territory.

Under the guidance of the People’s Committee of Quang Binh Province, the Women’s Federation, the Youth League, and the Veterans’ Association from the communes to the provinces actively launched anti-plastic waste movements, typical of the “Waste into Money” movement; building the model “plastic waste from the sea to the shore”; launching the program “Let us clean the sea—Friendly to the Ocean” and the competition “Design recycled materials”. These activities have contributed to spreading awareness and responsibility among youth and the community in environmental protection, promoting the spirit of application creativity to create products in practice, contributing to the reduction of plastic waste, reducing pollution, and jointly building a green, clean, beautiful, civilized environment.

The Bao Ninh Commune Women’s Federation (Dong Hoi City) has launched the initiative “Transforming garbage into money”; building the model “Gathering plastic waste from the sea to the shore”;... These activities contribute to protecting the environment, creating jobs for members and women, and raising charity funds for orphans and women in difficult circumstances. Specifically, members of the Commission of Action of the Women’s Union have come directly to the boat owner’s campaign to commit to bringing plastic garbage and broken nets to the shore for recycling, selling waste, contributing to the construction of a charity fund, establishing rules for collecting plastic waste on ships, creating a network patching cooperative, organizing awareness-raising exercises for ship owners, training, and instruction in the technical patching of nets from broke nets for female members for reuse. From things such as broken nets and crushed nets brought back from the coast, the Women’s Federation has wrapped over 500 products into food bags and plastic garbage bags, donated a fund of VND 25 million to visit, gave approximately 30 gifts to women and children in difficult circumstances, fishermen in distress at sea, and received the head of an orphan for three years (Lien, 2022).

Quang Binh fishermen on long-range mining vessels are actively engaged in the fight against marine environmental pollution from plastic waste. In 2021, the Union of the Department of Agriculture and Agricultural Development of the province of Quang Binh and this Union of Industries launched and mobi-

lized people to participate in the movement “Plastic waste collection on remote fishing vessels” to maximize the situation of fishermen dumping waste directly into the sea, contributing to the protection of the environment and fisheries resources. The model was initially deployed in Canh Duong commune but was later expanded to other locations. Since the beginning of 2021, more than 500 fishing vessels from communities such as Duc Trach, Hai Trach (Bo Trach District), Quang Van, and Quang Phuc (Ba Don Towns) have participated in this model. In the coming time, the departments and associations of the province of Quang Binh will continue to promote publicity, and fishermen will join the model of “collecting waste on fishing boats” to reproduce this model throughout the province to contribute to reducing environmental pollution and raise awareness in the people’s community about jointly protecting the field (Quang Binh Provincial Labor Federation, 2020).

Third, actively organize publicity activities to raise awareness among citizens, officials, and public officials about the prevention of pollution from plastic waste at sea.

On August 11, 2019, the Quang Binh Department of Resources and Environment joined with the province, TMS Group, the youth association of the Viet Nam province Green Sunday Program, to launch the campaign “Cleanse the sea—Clean the ocean” and organize the competition “Design recycled materials.” Immediately after the ceremony, approximately 1,000 youths and residents from Dong Hoi City were actively involved.

Fourth, the inspection, monitoring, and timely handling of marine environmental pollution behavior from plastic waste may be strengthened.

Localities in the province of Quang Binh, especially those with well-developed marine tourism activities such as Dong Hoi city and Quang Trach District, have established self-governing teams and promoted the role of the townsman in managing, inspecting, and supervising the discharge of plastic waste at the local level.

On March 6, 2023, the People’s Committee of Quang Binh Province issued Document No. 316/UBND-KT on strengthening state management work on environmental protection in the province. The People’s Committee of Quang Binh Province has requested departments, committees, branches, provincial associations, districts, towns, and cities to continue to develop plans to implement the Environmental Protection Law 2020, the directives, resolutions, strategies, planning, and legislative regulations of the state on environmental protection by sector and area of management. It is noteworthy that the People’s Committee of Quang Binh also requests regular inspections, inspection, monitoring and handling of violations in the implementation of environmental protection work in production, business, services under the regulations; construction of environmental protection works, waste treatment; installation of automatic continuous surveillance equipment and environmental monitoring; active monitoring, monitoring the discharge activity of production facilities, especially facilities with a high risk of pollution of the environment; and serious implementation of the provisions of the legislation on environmental protections for production sites, centralized services, and industrial clusters. Publicly disclose information on violations of environmental law

by enterprises, organizations, and individuals; withdraw environmental permits in accordance with regulations; ensure coordination among the authorities in the inspection; and avoid duplication.

As of the end of 2022, the Department of Resources and Environment of Quang Binh Province has issued one inspection conclusion, completed one, and is conducting one. The department has issued one inspection conclusion, completed one, and is conducting one. Through the inspectors, the investigation penalized administrative violations in 23 cases (20 organizations, 3 individuals) for more than VND 4.5 billion. Among them, the Chief Inspector punished 17 cases, including 16 organizations and 1 individual, for more than VND 750 million; the Chairperson of the Provincial Government of the Republic of Kazakhstan punished 02 individuals and 04 organizations for almost VND 3.8 billion. The main groups of violations in the area of environmental protection are discharge of waste that pollutes the environment; improper implementation of the provisions in the environmental impact assessment report (DTM report, environmental conservation plan, confirmation of completion of ecological conservation works, etc.); and improper management of waste.

Fifth, actively build and develop a local waste collection network.

According to the Vietnam Plastics Association, every day in Vietnam, approximately 80,000 tons of plastic waste is discharged into the environment, with only 20% being recycled and 80% being disposed of as burial or incineration, which can have consequences later on. To date, there are 126/151 municipalities, branches, and towns in the province of Quang Binh covered by a waste collection network implemented by the Public Works Management Board, the Quang Binh Environment and Urban Development Corporation, or by self-employed enterprises, nets, and self-governing environmental sanitation teams. In the province, there are 7 active solid waste landfills, 1 waste disposal plant in Li Qi, Bapu Qi district of the Vietnam Project Development Limited Responsibility Company, and 1 waste incinerator in Evanxiang, Xianxiang district. The total amount of waste collected and disposed of to ensure environmental hygiene is approximately 408.58 metric tons per day, reaching 80%, of which the urban area of waste collection and disposal reaches 90% and the rural area of waste disposal reaches 74%.

3.3. Propose some solutions.

It can be asserted that the authorities and the people of Quang Binh Province, Vietnam, have made many efforts to prevent marine environmental pollution from plastic waste. However, this work currently has a number of limitations, both in domestic policy, law, and implementation in practice.

Specifically, in terms of policies and law, Quang Binh province has largely only issued plans, directives, and publications; no resolutions or legal decisions; and no regulations on the reduction, reuse, recycling, or treatment of specific plastic waste in accordance with local realities. Quang Binh Province has no rules, regulations, or conventions to mobilize the participation of the community in the management of plastic waste and

environmental protection; there are no preferential policies for investment projects in the construction of recovery facilities, plastic waste treatment, or projects for the production of environmentally friendly products. There is no policy to search for or mobilize economic components to invest in the fields of sorting, collection, transportation, and waste treatment at the local level; no policies to encourage consumers to use bags and packaging when purchasing; and timely rewards for individuals and good organizations in the context of waste management or waste pricing initiatives.

Regarding enforcement, the effectiveness of enforcing policies, legislation on the protection of the marine environment in general, and the prevention of marine pollution from plastic waste in general is not high. The collection of garbage on some routes is still occurring, causing a loss of urban architecture, and is aimed at ensuring environmental hygiene throughout the streets. The sorting of waste at the source has not been widely implemented due to the lack of specific household guidelines, facilities, techniques, and infrastructure for sorting, collecting, and handling plastic waste. Inspection, monitoring, detection, and handling of violations of the collection, transportation, and treatment of plastic waste have not been proactive, not timely. The sense of enforcement of the law on environmental protection and the prevention of plastic waste among some people is not good; they have not formed a habit of living on the protection of the environment as garbage is not in the prescribed place, especially in the areas of Dong Hoi Market, Dong My Market, Dong My Park, and Ho Chi Minh Square.

To limit marine environment pollution, including plastic waste, the province of Quang Binh needs to implement the following synchronous solutions:

The first is to request that Parliament and the government amend and supplement existing legislation to create legal corridors for the management, inspection, monitoring, and handling of marine environmental pollution from plastic waste. To do this, the authorities of the province of Quang Binh need to propose to the State authorities in the Covenant to consider incorporating provisions on the prevention of pollution of the marine environment from plastic waste into existing legislation, such as the Environmental Protection Act 2020, the Resource, Marine and Island Environment Act 2015; and to propose increased administrative penalties for violations against individuals, organizations and penalty and imprisonment for environmental offenders to be proportionate to the damage caused by the environmental behavior that pollutes the sea by plastic waste; and the proposal to develop a separate law to deal with criminal offences that pollute the sea environment.

Second, legal documents (such as resolutions or decisions) should be issued to prevent local marine environmental pollution. In addition, regulations on the reduction, reuse, recycling, and treatment of specific plastic wastes in accordance with local practical conditions should be enacted; mechanisms for the protection of whistleblowers, officers, and civil servants should be established to enforce the law on the prevention of pollution of the marine environment from plastic waste in Quang Binh Province.

Third, establish regulations and conventions to mobilize com-

munity participation in the management of plastic waste and environmental protection, adopt incentive policies for investment projects to build recycling facilities, dispose of plastic waste, and produce environmentally friendly products, and find and mobilize economic components to invest in the fields of classification, collection, transportation, and disposal of local waste. Encourage consumers to carry bags and packaging when shopping, as well as provide timely rewards to individuals and organizations with good achievements in the anti-plastic waste movement or valuable initiatives in the management of plastic waste.

Conclusions.

Plastic waste is now becoming a global problem, causing many negative impacts on human health, the marine environment landscape, marine biodiversity, and the socioeconomic development of Vietnam, including the province of Quang Binh. Due to its natural characteristics as a coastal province located in the Central Vietnam Strait, the province of Quang Binh has suffered many consequences due to plastic waste from other waters flowing in and plastic waste discharged by the local people themselves into the sea. To minimize the negative impact of marine environmental pollution from plastic waste, the province of Quang Binh has mobilized the broad involvement of governments, branches, associations, and local people involved in this work. In addition to reaching the above achievements, this work is also faced with many limitations caused by inadequacies in state and local policies and laws, as well as in people's awareness and habits and even the management of local government levels. Therefore, to achieve marine pollution prevention from plastic waste, the province of Quang Binh needs to attract the unity and contribution of the whole political system and society through the synchronous implementation of many solutions, focusing on the perfection of policy and legislation and raising awareness among the people.

References.

Beaumont N.J. et al. (2019) Global ecological, social and economic impacts of marine plastic. *Marine Pollution Bulletin*. Vol.142: pp. 189-195.

CIEL. (2019) Plastic and Health: The Hidden Costs of a Plastic Planet [online]. Available online at: <https://www.ciel.org/wp-content/uploads/2019/02/Plastic-and-Health-The-Hidden-Costs-of-a-Plastic-Planet-February-2019.pdf>. [Accessed on 14 June 2024].

Communist Party of Vietnam .2022. Some knowledge of plastic waste [online]. Available online at: <https://dangcongsan.vn/xay-dung-xa-hoi-an-toan-truoc-thien-tai/mot-so-kien-thuc-ve-rac-thai-nhua-614734.html>. [Accessed on 20 July 2024].

Costanza, R. et al. (2014) Changes in the global value of ecosystem services. *Global Environmental Change* 26(1): pp.152-158.

Cuong, Hung.N. (2023) Quang Binh Province Policy, Legislation on Preventing Marine Environmental Pollution from

Plastic Waste, *Proceedings of the Conference on "Policy and Law on Protection of the Sea Environment and Prevention of Plastics Waste" organized by the Scientific Research Institute of Sea and Islands in Quang Binh, Viet Nam* on October 21, 2023.

Garcia, B., Fang, M. M., and Lin, J. (2019) All Hands on Deck: Addressing the Global Marine Plastics Pollution Crisis in Asia. *SSRN Electron Journal*.

Geyer, R., Jambeck, J.R. and Law, L.L. (2017) Production, use, and fate of all plastics ever made. *Science Advances* 3(7).

Isobe, A. et al. (2015) East Asian seas: A hot spot of pelagic microplastics. *Marine Pollution Bulletin* 101(2): pp. 618-623.

Lien, B. (2022) Quang Binh fishermen with the model of "putting garbage on the shore" after each departure" [online]. *Communist Party of Vietnam*. Available online at: <https://dangcongsan.vn/multimedia/mega-story/bai-3-ngu-dan-quang-binh-dua-rac-vao-bo-bao-ve-moi-truong-bien-sau-chuyen-ra-khoi-6-12324.html>. [Accessed on 10 June 2024].

Minh, Van. P.D. (2023) Status of implementation of policy and legislation on prevention of plastic waste in Donghai district, Donghai city, Quang Binh province: Restrictions, imperfections to be overcome, *Proceedings of the Conference on "Policy and Law on Protection of the Marine Environment and Prevention of Plastics Waste" organized by the Institute of Marine Science and Islands Research in Quang Binh, Viet Nam* on October 21, 2023.

Nhien, An. (2021) Plastic Waste in Vietnam – Chapter 2: Impact on Human Health and Economic, Social Development. *E-Journal Environment and Life*. Available online at: <https://moitruong.net.vn/rac-thai-nhua-o-viet-nam-bai-2-anh-huong-den-suc-khoe-con-nguoi-va-phat-trien-kinh-te-xa-hoi-12-159.html>. [Accessed on 22 July 2024].

Quang Binh Provincial Labor Federation. (2020) The Union of Basic Branch of the Department of Aquaculture in response to the waste collection camp and the anti-plastic waste camp [online]. Available online at: <https://ldld.quangbinh.gov.vn/3cms/cdcs-chi-cuc-thuy-san-huong-ung-phong-trao-thu-gom-rac-thai-va-chong-rac-thai-nhua.htm>. [Accessed on 12 August 2024].

Schwarz, A.E et al. (2019) Sources, transport and accumulation of different types of plastic litter in aquatic environments: A review study. *Marine Pollution Bulletin* 143: pp92-100.

Thanh, Hai.T, Hai, Nam.V. (2019) The 'Crisis' of Plastic Waste in Vietnam is Real [online]. *European Journal of Engineering Research and Science* 4(9) September 2019: pp.107-111. Available online at: DOI: <http://dx.doi.org/10.24018/ejers-2019.4.9.1523>. [Accessed on 25 August 2024].

Thieu, H. (2020) Quang Binh: Coastal Plastic Waste Control [online]. Available online at: <https://baotainguyenmoitruong.vn/quang-binh-kiem-soat-rac-thai-nhua-bo-bien-317390.html>. [Accessed on 13 September 2024].

United Nations. (2018) The state of plastics: World Environment Day Outlook 2018.

Wilcox, C. et al. (2018) A quantitative analysis linking sea turtle mortality and plastic debris ingestion. *Scientific Reports* 8(1).

Worldwide Fund For Nature. (2021) Plastics: The cost to society, the environment and the economy [online]. Available

online at: https://wwfasia.awsassets.panda.org/downloads/tcops_6_10.pdf. [Accessed on 2 October 2024].

Zheng J. and Suh, S. .2019. Strategies to reduce the global

carbon footprint of plastics. *Nature Climate Change*. Vol. 9: pp 374-378.