

Pollution due to Plastic Waste in Vietnam

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Abstract— WWF outlines four areas that are adversely affected by plastic waste: human health, the environment and marine life, climate change and air pollution, and ultimately quality of life and economy. According to WWF, 270 species are directly affected by ocean plastic waste, of which, more than 240 species have plastic in the digestive system. Scientists once discovered a whale with 30 plastic bags in its gut. Images of marine creatures playing in the sea of plastic trash, holding plastic trash or getting caught in plastic garbage have become familiar. Plastic waste also affects human health through eating and drinking. A lot of research has been done on the toxicity of plastic to human health. 4% of plastic resins are additives that help plasticize, increase durability, transparency or other properties of plastic. Plastic itself has the ability to adsorb pollutants to become pollutants. Both plastic additives and pollutants can combine with organic or inorganic substances to become persistent organic / inorganic substances. According to scientists, the spread of persistent organic pollutants (POPs) through the food chain has been extensively studied in recent years. Many substances seriously affect human health such as phthalates, bisphenol A (BPA). Biphenol A (BPA) causes impaired male reproductive function, genetic modification in babies and carcinogenicity to those who are exposed regularly. Phthalates cause hormonal disorders and affect fertility.

Keywords—Plastic Waste, Environmental Pollution.

I. INTRODUCTION

According to environmentalists, in the context of not being able to find an alternative plastic material, more environmentally friendly, limiting the use of plastic once is an immediate measure. The Ministry of Natural Resources and Environment recently launched a movement to say no to plastic waste by stopping the use of plastic bottles once in meetings, instead of metal bottles. The Ministry of Natural Resources and Environment calls on ministries, branches, localities, mass organizations and businesses to join this campaign. WWF cites statistics, which are found in 93% of bottled water samples from 11 brands in 9 countries. Each person absorbs a maximum of 4620 microplastics / year eating with countries consuming seafood. In addition, each year inhales 13,731 - 68,415 microscopic particles of plastic from household furnishings. According to the United Nations, 1,000 plastic bags are consumed every minute but only 27% of them are processed and recycled, and by 2050, plastic waste will be heavier than the amount of fish in the oceans. According to statistics of the World Wide Fund for Nature (WWF), about 150 million tons of plastic waste are floating at sea. Plastic production is forecast to increase by 40% by 2030 if we do nothing to change. According to the Department of Waste Management, if plastic and plastic bags are not reused or recycled, the amount of plastic waste and plastic bags in Vietnam is approximately 2.5 million tons / year. Plastic

consumption index per capita in Vietnam has increased rapidly in recent years. If in 1990, each Vietnamese consumed about 3.8 kg / year, by 2015 this number had increased to 49 kg / person / year, nearly 13 times. The concern is that plastic waste and plastic bags generated from households, markets and public areas in Vietnam have not yet been sorted at source. They are treated with domestic solid waste. Meanwhile, the treatment of daily-life solid waste still has many limitations and shortcomings. The two main treatment methods are landfill and incineration. The method of landfill waste of land and waste has not been thoroughly treated, continues to exist for a long time, causing soil and water pollution. Meanwhile, the combustion method causes concern about the release of Dioxin / Furan. A new ranking has just named "Vietnam": Vietnam is one of the top 5 countries responsible for about 13 million tons of plastic released into the ocean / year. And the abuse of disposable plastic is growing everywhere[1]. Another noteworthy figure from the United Nations Food and Agriculture Organization (FAO) came out at the mid-2019 conference. According to FAO, an estimated 1.8 million tons of plastic waste is generated in Vietnam per year, while plastic consumption is estimated to increase 16-18% / year [2]. In some coastal areas in Vietnam, each net draws up to 1 in 3 fish to plastic waste. Each year Vietnam releases 0.28 million to 0.73 million tons of plastic waste (accounting for 6% of the world total), ranking the fourth in the world - the representative of the United Nations Environment Program publishes this information at International workshop on consultative development of national action plan for plastic waste management in the morning of December [3]. The top countries are China, Indonesia and Philippines respectively.



Fig. 1. In each trawl, up to 3 out of 3 fish have plastic waste.

Only a small portion of the aforementioned plastic waste is collected, recycled, and the remaining is buried with garbage or disposed of everywhere. The sea is one of the final destinations of nylon bags [4].

Once released into the ocean, it takes more than 400 years for plastic waste to decompose. According to statistics, every minute goes by more than 1,000 nylon bags are consumed [5]. Restricting, approaching no plastic waste is an urgent measure to protect the ocean and also the future of the next generation. In fact, almost everyone knows that using plastic products such as disposable cups, plastic bags, plastic straws, etc. is harmful to the environment, takes many years to decompose, but this is used increasing [6].

II. SITUATION OF WASTE PLASTIC IN VIETNAM

Plastic pollution and plastic waste are one of the global environmental, economic and social threats and challenges. Vietnam is one of the top 4 countries in the list of countries

with the highest amount of plastic waste discharged into the ocean. Meanwhile, the plastic industry in Vietnam is the second fastest growing region in the economy and imports up to 80% of scrap plastic because the domestic supply does not meet the quantity and quality requirements. amount of industry. On the other hand, plastic waste in our country is considered to be of low value or no value and discharged into the environment.. According to the United Nations Environment Program Report 2018: Every year the world uses 500 billion plastic bags and about 40% of the plastic produced for packaging. In Vietnam, according to a report of the Plastic Association, in 2015, Vietnam produced and consumed about 5 million tons of plastic, of which, about 80% of imported materials used from scrap plastic. Plastic consumption index per capita in Vietnam increased rapidly from 3.8kg / year / person in 1990, to 41kg / year / person in 2015.



Fig. 2. The countries polluting the oceans the most with plastic waste

The import of plastic scrap has been gradually "controlled," from 2016-2018, the Ministry of Natural Resources and Environment issues a Certificate of eligibility for importing plastic scrap for 37 enterprises to use as raw production materials. a total of 208 businesses were granted with 34 direct import units and 3 entrusted import units. However, the amount of imported plastic scrap has increased, in 2016 was 18,548 tons, 90,839 tons in 2017 and 175,000 tons in the first 9 months of 2018. According to the Ministry of Natural Resources and Environment, Hanoi emits 4,000-5,000 tons of garbage every day, of which plastic waste accounts for 7-8%, only the two big cities of Hanoi and Ho Chi Minh City alone, releasing about 80 tons of plastic and

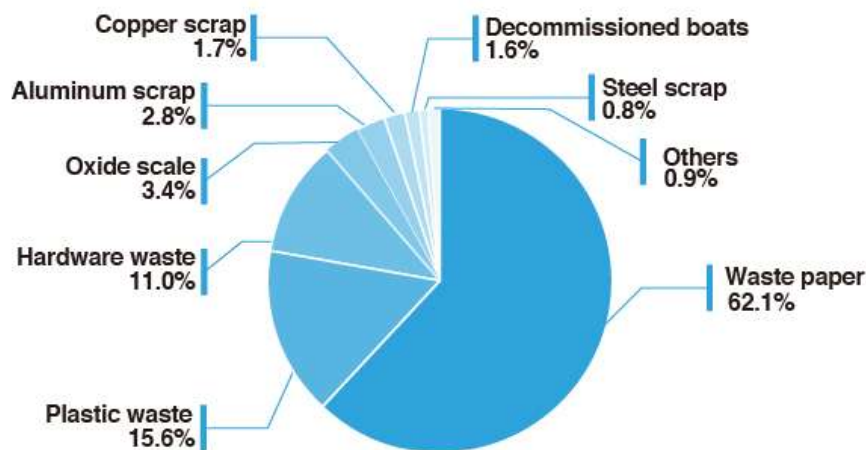
plastic bags / day. Notably, the amount of plastic waste and plastic bags nationwide accounts for about 8-12% in domestic solid waste. If an average of about 10% of plastic waste and plastic bags are not fully reused but completely discarded, the amount of plastic waste and plastic bags is approximately 2.5 million tons / year, which is a burden to the environment, even leading to the "white pollution" disaster. Vietnam's plastic industry is divided into main groups including packaging plastics, household plastics, building materials, and high-tech plastics. The country now has about 2,000 plastic businesses, of which 450 are packaging manufacturers. Scrap plastic generated from manufacturing facilities is mostly collected and sold to recycling facilities. Today, the production and

consumption of plastic products and plastic bags have become popular in people's daily lives. However, due to the rate of collection, transportation and solid waste (CTR) activities (including plastic waste and plastic bags) in Vietnam has not reached the target. This is a direct cause of environmental pollution caused by plastic waste and plastic bags, which has continued to increase over time.

The scientific-technological revolution of the mid-20th century brought many valuable new products to mankind, including plastic. Plastics have quickly come to life in every field. However, overuse and the incompatibility of collection, recycling and reuse have caused plastic waste to spread in the

environment, causing "white pollution". Scientists say plastic waste can persist for a long time in an environment that seriously affects soil and water. For example, when plastic bags are used as packaging, even if collected and sent to landfill, the plastic bags and the soil still exist for hundreds of years, causing damage to the soil, affecting plant growth. Plastic bags also clog drains, ditches, canals and ditches, causing sewage stagnation and flooding to produce many pathogenic bacteria for humans. When burning them, if there is no good management of toxic emissions, they will cause serious environmental pollution.

A Breakdown of Imported Waste for Recycling in 2015



Source: Ministry of Environmental Protection

Caixin

Fig. 3. Scale of reuse in waste plastic

Plastic waste generated from daily-life and consumption activities, not yet classified at source; Plastic waste with recyclable value is collected spontaneously in the household scale, garbage collectors and free scavengers. Plastic waste from daily life is collected from many places such as households, supermarkets, landfills Plastic waste without or having low recycling value is plastic bags, foam boxes of all kinds, plastic straws are discharged into the environment, especially, currently the use of plastic bags is usually a kind of ultra-thin, hard-wearing bags. Destroy and discard after one use. As of May 2018, there are 43 products of 38 companies that have been certified by the Ministry of Natural Resources and Environment as environmentally friendly plastic bags such as Tan Chi Thanh biodegradable plastic bags (Long An), bags biodegradable AAA of An Phat Plastic and Green Environment Joint Stock Company (Hai Duong), ALTA biodegradable plastic bags of Tan Binh Cultural Joint Stock Company (Ho Chi Minh City). According to experts, it takes hundreds, even thousands of years, the waste from plastic and

plastic to decompose. Plastic waste when incinerated will create toxic gas, lasting in the environment, directly affecting human health. Meanwhile, according to the United Nations report, each year the amount of plastic waste generated is enough to surround the earth 4 times. 1,000 plastic bags are consumed every minute, but only 27% of these are processed and recycled. Plastic waste is very much on the bottom of the ocean and will become a food poison to poison marine creatures.

III. THE CHALLENGES OF WHITE POLLUTION

Vietnam has policies to strengthen control of environmental pollution due to the use of hard-biodegradable plastic bags in daily life, integrated management of solid waste. In addition, the Ministry of Natural Resources and Environment in collaboration with ministries, sectors and localities organize workshops to popularize and propagate the harmful effects of the one-time use of persistent plastic bags, encourage the community to strengthen recycling, use plastic

bags, use more friendly products like biodegradable plastic bags. The Ministry of Natural Resources and Environment has carried out a number of scientific research projects such as "Researching theoretical basis and international experience on plastic waste control at sea" "Study on micro waste management plastic," " Study and propose solutions to manage and control marine plastic waste, especially in countries with similar conditions to Vietnam. " The Ministry of Science and Technology shall coordinate with the Ministry of Industry and Trade in carrying out the programs "Application research and development of new material technologies," "Technology innovation till 2020," ... to include the contents of the Project. control of environmental pollution caused by plastic bags into the Science and Technology program on environmental protection. Local authorities have issued decisions or directives to strengthen the management and use and disposal of persistent plastic bags, and even stop licensing investment for businesses that produce indestructible plastic bags. Many supermarkets and commercial centers in special and type I cities such as Big C, Maxi Mart, Vinmart, Coopmart ... have used environmentally friendly plastic bags instead of difficult to biodegradable plastic bags. Emphasizing on solutions, Master Nguyen Thuong Hien, Director of Department of Solid Waste Management, General Department of Environment, Ministry of Natural Resources and Environment said to the effective management and implementation agency of Decision No. 491. / QD-TTg dated May 7, 2018 of the Prime Minister approving the adjustment of the National Strategy on integrated management of solid waste by 2025, vision to 2050 with specific targets for solid waste urban activities. All special and grade 1 municipalities have solid waste recycling facilities suitable for household classification; The remaining 85% of cities have solid waste recycling facilities suitable for household sorting; increase recycling, reuse, and treatment associated with energy recovery; using 100% environmentally friendly plastic bags to replace indestructible plastic bags at trade centers and supermarkets. Plastic and plastic products have been polluting the environment, leaving unpredictable consequences for human health and plant and animal species for the world, including Vietnam.

Most items for daily life of people are made of plastic, from televisions, refrigerators to spoons, drinking glasses, straws ... Even high-class, sophisticated products robots, microchips, etc. all have plastic. The reason this material is widely used is because of its low cost and durability; Has physical properties such as electrical insulation, thermal insulation, moisture resistance, toughness, durability and ease of processing. The value that it brings is a huge utility but at the same time contains countless environmental hazards, so much so that the whole world is raising a wake-up call about the fear of being called "plastic waste". Not only humans, the ecosystem on Earth is also seriously threatened. Images of animals dying from plastic are no stranger to humans. Whale bodies washed ashore with tons of plastic in their bellies; fish and birds die from eating the wrong plastic ... Plastic rubbish is becoming a poison to creatures both on land and underwater. To overcome the danger of causing environmental

pollution due to plastic bags, over the past time, Vietnam has implemented many practical activities, spreading widely the message of solving plastic and nylon pollution, in order to call the community together. change consumer habits and discard plastic waste. Specifically controlling the collection, transportation and disposal of waste and garbage; concentrating resources to thoroughly solve the environmental pollution issues from waste and rubbish, which are directly affecting people's lives and livelihoods; encourage the organization of construction commencement, construction and handover of environmental protection facilities to serve the community's interests such as wastewater treatment facilities, urban and rural solid wastes; planting green trees to block sand, prevent erosion and prevent saline intrusion; implementation of environmental criteria in new rural construction; support people to adapt to climate change. The Ministry of Natural Resources and Environment reviews and amends the Prime Minister's Decision 73/2014 on the list of scraps allowed to be imported in the direction of allowing only the import of high-recycling plastics; guide ministries, branches, localities and organizations and individuals to strictly implement waste and scrap management, including requirements for classification of recycled plastic waste from daily-life and solid waste of industry; Waste must be managed from generation to collection, transportation and disposal. The Ministry continues to implement the Prime Minister's Decision No. 582 / QD-TTg approving the Scheme on strengthening environmental pollution control due to persistent nylon bags in daily life by 2020, in which identifying task groups of services, synchronous solutions for the economy and society as well as the treatment of environmental pollution with the goal "In 2020, to reduce 65% of the volume of persistent plastic bags used in supermarkets and trade centers compared to the year. 2010 ". State management agencies shall work out appropriate policies, strategies and planning to bring small scattered dispersed plastic recycling facilities with simple technology into concentrated industrial parks and upgrade treatment technologies. suitable recycling and recycling; encourage the application of new technology in treating and recycling plastic waste; establish concentrated plastic recycling industrial zones; limit and proceed to end the import, production and supply of indestructible nylon bags from 2026 at commercial centers and supermarkets for daily-life purposes; further promoting the collection of environmental protection taxes for persistent plastic bags; enhance propaganda and advocacy to raise public awareness about plastic and plastic waste management. Enterprises strictly abide by the environmental protection regulations in the production process of their products and commit to register for recognizing environmentally friendly plastic bags; coordinating with management agencies and specialized agencies in propagating and disseminating accurately about technical characteristics as well as types of environmentally friendly products so that communities and consumers have a proper understanding of types product picture. In Ho Chi Minh City, only in 4 canals alone: Doi, Te, Tau Hu, Ben Nghe, environmental workers salvage 10-40 tons of rubbish / day, sometimes - up to 80 tons,

during Tet - sometimes up to 80 tons. part is domestic waste, plastic bags, foam ... According to a survey of the Ministry of Natural Resources and Environment (TN-MT) recently, in Ho Chi Minh City, there are about 30 tons of plastic used per day in markets, supermarkets and trade centers; 34-60 tons of nylon / day is equivalent to 5-9 million plastic bags / day from households. The amount of plastic bags increases year by year, putting enormous pressure on the environment. There are only two ways to dispose of this type of waste, or both to bury it and incinerate it, both of which have a negative impact on the environment. Because it takes hundreds, even thousands of years, plastic and plastic wastes to decompose. Plastic and nylon wastes, when burned, will create toxic gas and last for a long time in the environment. According to the United Nations report, each year, the amount of plastic waste generated enough to surround the earth 4 times. 1,000 plastic bags are consumed every minute, but only 27% of these are processed and recycled. Plastic waste is very much on the bottom of the ocean and will become a food poison to poison marine creatures. In particular, 60% of plastic waste discharged to the sea comes from 6 countries in Asia, including Vietnam.

IV. CONCLUSION

Every day, Vietnam discharges about 2,500 tons of plastic waste, including nylon bags. According to the Vietnam Plastic Association, cited by Siamactu.fr, in 1990, each Vietnamese consumed about 3.8 kg of plastic; 25 years later, this number has increased more than 10 times, about 41 kg. Up to 1,000 nylon bags are used every minute and only 27% of them are processed and recycled. Plastic waste, especially nylon bags, take at least more than 100 years to disintegrate. Due to not being reprocessed or indiscriminately, in many areas, people helplessly look at nylon bags filled with tree branches and

cliffs; Plastic waste floats on many beaches or gets submerged underwater. In some coastal areas of Vietnam, in each net pulled up, every 3 parts of fish there is a part of plastic waste. The cause of the widespread plastic waste in Vietnam is that the waste management and treatment is still very loose, mainly the landfill method. The authorities have not been determined to set restrictions, even banning the use of nylon bags.

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