Effects of plastic waste to sea environment in Vietnam

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Abstract. Currently, plastic products are commonly used in a developing country like Vietnam, the demand for plastic items has become more and more popular. The introduction of these plastic products has brought many benefits to Vietnamese people. However, going along with utilities plastic goods are also the factors affecting our living environment. In addition, the abusing and discharging plastic products into the environment in this country have become great concerns which are at alarming level. Witnessing the widely popular realities of using plastic items leads to the difficulties in controlling waste and the serious effects of it to the environment in general and to the marine environment in particular. This paper was based on the information of many journals and supports of the respondents who are studying at FPT University from May 13 to May 24, 2019 through the student survey. From then on, some solutions were mentioned to make the marine environment a better place.

1. Introduction
Vietnam is now facing three major pollution issues including soil environmental pollution, water pollution and air pollution. This is considered a consequence of human impact. Along with the current population growth rate, the speed of industrial development and urbanization, the area of cultivated land is getting narrowed. Soil quality is increasingly degraded, land area per capita decreases, this is collectively referred to as soil pollution. However, considering the speed of spread and the scale of influence, water pollution is a more worrying issue due to the appearance of foreign substances in liquid and solid form, making the water source toxic to humans [1]. Every year, people exploit and use billions of tons of coal, oil and gas, emitting a strange amount of substances, causing important changes in the air component. This makes the air unclean or has an unpleasant odour, decreased vision when viewed from dust [2].

Today, there are many environmental problems in Vietnam, partly as a result of the Vietnam War, as well as the rapid industrialization and modernization process since the economic reforms in 1986 caused strong environmental impacts. Accordingly, a number of key issues that are causing concern for the government and the people are land pollution, forest resource degradation, ecological imbalance, water pollution, air and pollution. Most important is waste management. Therefore, all levels of government are trying to make corrective measures to contribute to keeping the green environment clean, protecting ecosystems and people by the consequences of climate change and pollution.

We understand that plastic has long been an important role in human life worldwide. Löhr (2017) argued that “since the 1950s the amount of plastics in the environment has increased dramatically”, it is an integral part of the economy because of low cost, superior performance and durability [3]. It has been used in all industries, mainly in packaging industries. The convenience and economic efficiency of plastic are indisputable because of it positive contributions in life [4]. However, plastics also cause
serious environmental problems, especially the marine environment. In a developing country like Vietnam, plastics are becoming more and more important and difficult to replace, which is why the marine environment in Vietnam is losing its inherent transparency, and as a result, the invasion of plastic waste and gradually kill marine life [5].

According to scientists’ estimates, the amount of plastic waste by 2050 in the oceans will be heavier than the mass of fish. Pollution of ocean plastic waste has become an urgent global issue, so it is necessary to have joint efforts of each country, region and the world [1]. In Vietnam, when people put economic efficiency first, removing plastic from life is not easy. However, because of a green environment, each of us needs to take responsibility for taking action by minimizing the use of plastic items to protect our lives as well as the lives of other organisms.

2. Content of research

2.1. Environmental status in Vietnam

The environment is a place to store and provide resources for production life and plays a role in serving and improving people’s lives [4]. According to the recent report of the Ministry of Natural Resources and Environment recently at the National Conference on Environmental Protection, every year, the whole country consumes more than 100,000 tons of plant protection chemicals. That means that the country generates more than 23 million tons of domestic waste, over 7 million tons of industrial solid waste, and more than 630,000 tons of hazardous waste while the ability to dispose garbage is rather limited.

In fact, there are about 283 industrial parks in which there are more than 550,000 m3 of waste discharging out of the environment everyday. More than 13,500 health facilities daily generate more than 47 tons of hazardous waste and 125,000 m3 of medical waste. The country currently has 787 cities with 3,000,000 m3 of waste but most have not been disposed properly. There are nearly 43 million motorcycles and over 2 million cars left here and there in the country. These are statistical figures showing the risk and phenomenon of environmental pollution, that is, the pollution is at an alarming level. Therefore, in order to preserve the environment as well as ensure the quality of human life and health, each individual must be aware of and strictly abide by the law on environmental protection.

Vietnam is a country known for its numerous beautiful beaches, it has been gradually becoming a tourist destination visited by many international visitors. In recent years, due to the increasing demand of human life, we can see our beaches as well as rivers and streams in this country are gradually losing the inherent green beauty. Instead of seeing pretty images, we often see long beaches, rivers and streams being smeared by ourselves [6]. There is no longer a clear blue sea, but instead, we can only see a beach covered with garbage or things that people often use. Full of different types of waste on the sea, including various kinds and plastic items [1]. The marine floating plastics are mostly polyethylene and polypropylene which are used to produce products such as shopping bags, food containers, soft drinks, and toys. They are difficult to decompose like other types of waste (Figure 1).
Therefore, wild marine animals face a number of increasing threats globally, the survival of many species and populations is now dependent on human conservation action [7]. A major threat that has emerged over the past decades has been the pollution of the ocean and coastal habitat with plastic debris and waste. The increasing occurrence of plastic in marine ecosystems reflects the popularity of plastic in society and reflects the high degradability of plastics in the environment [3].

2.2. Awareness of Vietnamese people towards the environment
Until now, a large number of Vietnamese people have not yet realized the danger of environmental pollution as well as the current serious pollution situation and the lack of awareness still remains unresolved [7]. The situation of garbage being dumped indiscriminately on roads, sewers, canals and public areas is very common even though on the road, the localities always arrange garbage bins or let the sign "Prohibit throwing garbage". Garbage is piled up, stagnant for a long time, creating conditions for flies, mosquitoes to reside, causing bad smell, losing beauty and environment and that is no longer a strange thing for many Vietnamese people. Instead of overcoming and limiting those things, they just complained and ignored them or do not do anything, or some people were familiar to the unexpected environment. It can be said that littering became a bad habit that some of Vietnamese people have in their mind.

2.3. Negative effects of plastic waste
Plastics are high molecular compounds used as materials to produce many kinds of things in daily life. Being an indestructible substance in the environment, it will seriously affect the environment. Plastic waste on the oceans is now at a warning level because it seriously affects the marine environment, and thereby indirectly affects people's health when using marine resources [1].

Of Asian countries, Vietnam generates a lot of plastic waste and has been ranked fourth, behind only China, Indonesia and the Philippines. On average, a Vietnamese person uses at least 30 kg of plastic-products per year. Therefore, every year, millions of tons of plastic waste are dumped into the sea and the ocean and cause serious impacts on seafood resources, ecosystem and reproductive health of coastal communities. Along with that, some people's awareness is not good about protecting the marine environment, as well as protecting the health of themselves and their families [2,7].

Vegeter et al (2014) mentioned that wild marine animals affected by plastic by accidentally eating plastic, accumulating in the body would die soon and this changes the integrity and operation of the living environment. Since plastic debris is the main cause of entanglement, both tiny and big pieces of debris go into the body of a variety of marine species. For example, a plastic bottle needs 400 years to decompose, after it decomposes, it turns into micro-plastic particles. So, if marine animals have the
ability to swallow small pieces of plastic into the abdomen, those plastic molecules will accumulate in the organism and cause poisoning. Therefore, the challenges of marine pollution caused by plastic waste are worldwide and require countries around the world to work together to resolve [1].

With sustainable characteristics in nature, plastic wastes (plastic bottles, plastic bags, food containers, water cups, straws, etc.) become a big challenge for the community due to difficult to decompose and pollute soil, water environment. This problem hinders the growth and development of plant species, seriously affecting the growth of the ecosystem. When burning, if plastic mixed with waste will release toxic gases such as dioxin and furan causing poisoning, affecting the endocrine gland, causing cancer, reducing immunity, etc. and negatively affecting human health [1,8].

2.4. Research methods
This article was completed with the support of 100 students from various university students. The reason for selecting these survey respondents is because they are young people and have practical knowledge. Therefore, the objectivity and reality of the collected data will be clearer. The survey results are compared and analyzed after they complete the questionnaires.

2.5. Survey results
To determine the consciousness and living habits of the respondents on the importance of limiting the use of plastic in order to reduce the amount of waste which is difficult to decompose into the environment, some questions have been designed in the table below (Table 1).

| Questions                                                                 | Number of respondents |
|---------------------------------------------------------------------------|-----------------------|
| 1. Do you often use personal cloth bags when shopping outside?            | 50%  41,7%  8,3%     |
| 2. Do you often sort waste?                                              | 16,7% 58,3% 25%      |
| 3. Do you often use plastic bags or paper bags?                          | 16,7% 33,3% 50%      |
| 4. Do you often use personal plastic / glass / stainless steel cups when  | 16,7% 58,3% 25%      |
| buying outside drinks instead of store glasses?                          |                       |

It reveals that many people still use plastic products when going shopping. That is a bad habit that they should take into consideration. They also have no idea about sorting waste although this plays a very important role. If they know how to sort wastes, the environment is surely cleaner.

To learn more about the pollution status of plastic waste, a survey was conducted to better understand each other's thinking about the current marine pollution environment (Figure 2).
Based on figure 2, the majority of people think that the situation of plastic waste affecting the marine environment is very serious (94%). Through the survey, we obtained results that only 6 people (6%) said that plastic waste has a moderate impact and no one (0%) thinks that its impact is little or no pollution to the marine environment [9].

Then, through question number 1 of figure 3: "How is the level of people using appliances made from plastic today?", it reveals that the students expressed their interest in the situation of using plastic today. Up to 94 out of 100 students (94%) chose "many", 6/100 students (6%) chose "normal", and no one chose the "never". Similarly, with the second question: "What do you think is the level of plastic waste in Vietnamese sea today?" And the third question: "How much do you care about pollution to the marine environment in Vietnam today?", most of the students also expressed a certain interest in the problem of plastic causing marine pollution today.
2.6. Solutions to overcome and protect the marine environment in Vietnam

To achieve the goal of reducing pollution, preventing adverse impacts on the environment and keeping the green living space clean and beautiful, the following methods need to be applied to overcome the negative consequences that are taking place.

First is planting many trees since this is a source of oxygen to the atmosphere and it is also a source of carbon dioxide, reducing soil erosion and ecosystems. The government as well as the people should have activities to plant trees around the house and sidewalk to enjoy the fresh air created by the trees. Failure to cut down green trees is also an environmental protection measure [10].

Second is handling the surrounding sanitation environment. In everyday life, people and animals emit a large amount of waste and waste, if we do not collect and process properly, it will pollute around such as water and air. And the waste will fall into the sewer, causing an obstruction of the sewer, the sewer block, causing the non-circulating flow of stagnant water to cause pollution. To avoid that, we should classify waste clearly into each type, construction collects waste by septic tanks and regular cleaning, besides sucking septic tanks periodically to avoid stasis. And most importantly, everyone needs to have a sense of hygiene for themselves and for everyone around them [11].

Third, what we need to do is to limit using plastic bags, plastic cups, straws. According to the nature of plastic-plastic waste, it is difficult to decompose in normal environment and it can exist for hundreds to thousands of years [9]. In order to solve this waste problem, it is necessary to have a smooth combination between both sides of the seller, providing these and consumer products. Sellers need to replace plastic bags, plastic cups, etc. with environmentally friendly items and encourage customers to bring their own bags and glasses for discount support. At the same time, buyers need to limit the consumption of plastic bags, plastic cups and equip themselves with cloth bags and stainless steel cups, personal glass. Thus both parties can save a considerable amount of money.

According to Nguyen (2011), to minimize the negative impacts of plastic waste in Vietnam in particular and the world in general, we need to focus on policy solutions and management of plastic waste. Actively organizing sea cleaning campaigns, propaganda sessions for all people to limit the use of plastic products, instead with plastic packaging with plant-based bags such as wood, rattan, bamboo, leaves, paper, etc.

In addition, the State should pay attention to the collection of plastic waste to clean the environment, create natural landscapes, and protect marine species. Propagating and raising awareness of households, individuals and agencies participating in environmental sanitation, dumping garbage at the prescribed places, seeing that garbage is picked up and discarded in garbage bins [11]. Enhance the management of plastic waste through human management to thoroughly collect generated waste. There is a reward system for those units that have successfully completed environmental sanitation. At the same time, pay a fine or make a record for those who commit acts of causing environmental pollution [6,10].

2.7. Limitations

This article has not been finalized because it has not been surveyed as much as possible. However, we will try to be more and more complete on this topic. Hopefully, I will have the opportunity to give a more perfect article for everyone in a near future.

3. Conclusion

Through this article, Vietnamese people regardless of age and rank need to learn basic knowledge about the environment and train their consciousness to preserve and protect them. That will play a huge role in the overall environmental protection issue of the whole country. Although it will have to go through a very long process to overcome and restore the environment, but the cooperation and consensus of the collective individuals will certainly get good results.

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