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MONOGRAPH

**“LEGAL NORMATIVE. SINGLE-USE PLASTICS IN GUAYAQUIL: WHAT IS
THE MUNICIPAL ORDINANCE REGULATION OF SINGLE-USE PLASTICS?”**

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Gratitude

This monograph was a learning process, and thanks to the help of many people I managed to finish this project. For this, I am very grateful to my tutor Laura Ortuño for helping me in every question I had, to Professor Patricia Sánchez for giving me the instructions on how to do it and my family who always supported me.

Although it may have been difficult for me at the beginning, each one of those people were always there for me, helping and supporting me. Thank you, and I hope to take advantage of everything you have given me.

Summary

In the present monograph, an analysis is made of the ordinance that regulates single-use plastics issued by the Municipality of Guayaquil, which consists of reducing the sale and regulating the production of single-use plastics. The municipality of Guayaquil sought through this ordinance to reduce plastic consumption to reduce pollution of the environment and in turn gave companies that manufacture these products a range of time, 36 months, to replace them with products biodegradable or products that in their composition are recycled.

The negative impact on the planet due to plastic increases daily and in Guayaquil the municipality issued this ordinance to reduce its use, thus motivating manufacturers and consumers to become aware of the problem, so that producers look for options for the same product but with materials that are friendly to the planet without our daily activities are affected.

The ordinance and environmental movements suggest that factories look for an alternative that is viable to replace single-use plastics but does not cause harm to the environment, these are biodegradable or ecological products. Although these are a little more expensive due to the lack of supply in the raw material market, pollution can be reduced by performing the same functions as single-use plastics.

Single use plastics are products that we use in our day to day but due to poor management in the collection of waste at source they end up polluting the environment. Unlike organic products if we dispose in a composting area are degraded without

damaging the environment, plastics take between 100 and 1000 years to decompose while organic products decompose 95% faster causing less impact on the environment.

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Introduction

The title of this monograph is ***Legal normative. Single-use plastics in Guayaquil: What is the municipal ordinance regulation of single-use plastics?*** Its purpose is to analyze the regulations of the ordinance issued by the Municipality of Guayaquil about single-use plastics. The importance of investigating this particular regulation is due to the fact that its main goal is the conservation of ecosystems, biodiversity and the prevention of environmental damage.

The objective of this monograph is to know the advantages and disadvantages of using single-use plastics and/or substitute products such as biodegradable ones, as well as to be able to determine their impact on the environment. Being a problem the mismanagement in the collection of plastic at source establish the cultural people's responsibility in plastics pollution.

For the present academic work it has been taken as reference the following books with their respective authors, "*Single-use plastics: A roadmap for sustainability*" by ONU Environment; "*Ordinance for the regulation of plastics*" by the Municipality of Guayaquil; "*Single-Use Plastics*" by Juan Eduardo Gil Mora and "*Circular Economy*" by Emilio Cerdá.

Nowadays single-use plastic is the most contaminating product that it looks, plastics are a very easily product to use and manipulate and because of that a lot of people uses it every day but is creating contamination because all the waste of plastics are thrown in the wrong way what causes plastic garbage that end in oceans increasing pollution. The municipality search ways to reduce this contamination and with the ordinance impact try to make the food franchise support this change joining movements such as "No

straws please" which is one of the most influential inviting to change plastic straws for paper straws.

The monograph has been divided into three chapters, the first chapter is called Single-use plastics: municipal ordinance and is about the analysis of the municipal ordinance and it's affects in society, the second is called The role played by single-use plastics in the businesses of Guayaquil and is about single-use plastics analysis, the problems that bring in society and how business have been affected and the third is called Ecological products analysis and is about ecological products analysis, advantages and disadvantages and circular economy.

(362 words)

Chapter I

Single-use plastics: municipal ordinance

1.1 Single-use plastics regulation in Guayaquil

The municipality of Guayaquil passed the ordinance concerning the regulation of single-use plastics. The products that are directly affected by this ordinance are those involved in the production, distribution and retailers of all types of single-use plastics. The fundamental purpose of this regulation is the conservation of our ecosystems and the preservation of the environment, which, has seen an exponential increase in so-called plastic garbage which is accumulating at an alarming rate, bringing with it a wide variety of issues, all the while, marine fauna have resulted as being the most affected by this impacting issue.

In view of these events, the municipality has issued the ordinance to regulate plastics. This regulation caters mainly to products such as plastic straws, tubs, plastic bags, containers, cutlery, plates and cups. These products, due to their particular manufacturing characteristics as well as for the very reason for which they are produced, are discarded immediately once they have served their purpose. Established as products which are disposable, efficient, and accommodating, nevertheless, due to their difficult and slow degradation which in some cases is null, they can be considered the highest risk factor affecting, contaminating and polluting the environment no matter how well they may have served out their purpose.

The regulation of plastics does not imply that plastic, in any of its forms, should be considered a harmful material to the planet, rather that the problem lies its misuse and lack of awareness as well as simple inconsideration by all round when it comes time to dispose of these products.

The implementation of this ordinance, must consider and analyze matters beyond the environmental matters such as how it affects many in the socioeconomic aspect. In other words, factories which cater to these product are directly affected by the changes in these regulation ,therefore, a solution to their problem must be sought out so as to find a suitable material which can be used as a substitute for their products which are currently made of plastic, and so, avoid a decrease in their sales, while keeping up as well as staying in the race with the competition, while on the other hand, maintaining an ecofriendly attitude which can overflow onto the implementation of these solutions in turn would result in higher acceptance of their new product and their sales.

Nevertheless, the new materials must be biodegradable, meaning new technologies must be adopted and incorporated quickly, which increases its production cost, making products more expensive, and directly affecting the distributor and the consumer.

1.2 Single-use plastics: definition

Due to the characteristic of "Petroleum resins" materials with which plastics are manufactured, these are difficult to be degraded. Therefore it must go through a natural process, which unfortunately can last up to 1000 years. It is said that plastic is a material that the planet cannot assimilate due to the pollution it produces mainly because only

10% of plastic products are recycled while the remaining 90% are discarded in places such as the seas, increasing pollution.

In every productive process, an environmental impact is generated, whether on the ecosystem or on its water or carbon footprint. In recent times, the debate concerning the prohibition or regulation of single use plastics has gained force, inclining the balance unfavorably against these few products, when, instead of prohibiting their use, we must promote their responsible consumption and recycling.

Single-use plastic has become a necessary product in every society. It has improved the quality of life, in homes and in business thanks to the solutions it offers in terms of hygiene, practicality, easy handling, storage and cost.

1.3 What the municipal ordinance of single-use regulation consists of

On September 25, 2018 the Municipality of Guayaquil issued an ordinance called:

Regulation of single-use plastics, this ordinance states

Ordinance for the manufacture, trade of any kind, distribution and delivery of single-use plastic products and specifically of plastic sorbets, containers, tubs, cutlery, cups, plastic and foam cups and T-shirt type plastic covers, including oxybiodegradable, in the canton of Guayaquil. (Municipal Ordinance, p.23)

This consists in replacing single-use plastics with products 100% biodegradable or recycled material to cause a lesser impact on the planet's pollution. These terms have been laid down and as such, businesses must adopt them by replacing the products they now use with biodegradable products.

The Municipality of Guayaquil gave companies deadlines to change their products for biodegradable, plastic straws have a period of 6 months to be switched out for 100% reusable or degradable ones, plastic bags also have a period of 6 months to consist of 35% of recycled material or be 100% biodegradable, 12 months to have 50% recycled material or be 100% biodegradable and 21 months to have 70% recycled material or be 100% biodegradable. As a result, single-use plastic products have a 36 months term to replace their materials with 100% biodegradable materials, 70% recycled material and re-usable material. (Municipal Gazette, pp.27-28)

As such, businesses in the city of Guayaquil must abide by these deadlines, respecting the deadlines set by the municipality to replace their products with those which are 100% biodegradable or consist of 70% recycled material. This time lapse is set so that companies do not continue to manufacture products that are harmful to the environment. The plastic companies of Guayaquil must abide by this ordinance within the time slots established, in article 19 of the general sanctions of the municipal ordinance it is states that “In case of non-compliance with the provisions set forth in this Ordinance, the offender shall be punished with:

1. Mild economic fine (...).
2. Serious economic fine and temporary closure (...).
3. Serious financial fine and definitive closure (...).” (Municipal Gazette p.30)

1.3.1 Reasons why the municipality decided to apply this ordinance.

The Municipality of Guayaquil echoing the warning call about the increase of plastic garbage in the seas by the ONU and institutions that protect the environment, decided to

issue a municipal ordinance that regulates the use of single-use plastic in the city of Guayaquil, becoming a pioneer in this type of ordinance in our country. The ONU warns that about 13 million tons of plastic are dumped into the oceans every year. With the issuance of this ordinance, the municipality seeks to make the industry, distributors and consumers aware of the environmental damage generated by single-use plastic products, in addition to this, it proposes the use of alternative, biodegradable materials that are or in turn those which can be included in the production of recycled material. Through the socialization of this ordinance, the municipality hopes to promote and inspire our society to recycle as well as for it to comprehend that it is one of the most important components of a circular economy.

Data provided by Puerto Limpio, the company responsible for garbage collection, determined that Guayaquil generates 4,200 tons of waste of which 100 tons are unrecycled single-use plastics. Viera (2011) states: "The garbage collection system in the city of Guayaquil does not contemplate the separation of the different raw materials that can be recycled" (p.1).

Similarly seeks to minimize the generation of plastic waste in the city of Guayaquil to help the planet by reducing the percentage of use of plastics, as well as improve the status of solid waste collection services, strengthen the recycling industry and ensure the safe disposal of waste in regularized landfills. (ONU Environment, 2018).

1.3.1.1 How this ordinance affects society in Guayaquil.

When a new invention that provides comfort to society is born, people enjoy without measure every benefit that this provides, without thinking the consequences that this can

bring later if we do not give it the right use and we do not use it in a moderate way. This happened with single-use plastics, plastic became a polluting product.

As part of its social policy, the municipality seeks to give people good quality of life as well as minimize any damage to the environment. This ordinance seeks to fulfill this goal by, actively engaging all those involved, the entire society at large in the best management and disposal of plastic waste.

In Guayaquil, the municipality applied the regulation of single-use plastics as a means not only to control manufacturers and distributors, but for people to become aware of the situation and realize the state of the planet at this time. The municipality decided that Guayaquil should change certain aspects in order to comply with the rules of good living and improve the quality of life not only for its people but for the planet. The Mayor, along with his councilors, announced that this ordinance will help foster the culture of recycling and the circular economy.

Cerdá (2016) states: "The circular economy is an alternative to the linear model of "extract, produce, consume, and throw away ". A circular economy converts goods that are at the end of their useful life into resources for other goods, closing loops in industrial ecosystems and minimizing waste" (p.19). This is what most influences people as it promotes recycling.

This has been developing little by little since this refers to regulate the excessive way in which we use single-use plastics, change our lifestyle, become aware of our actions and, most importantly, leave comfort aside. (1556 words)

Chapter II

The role played by single-use plastics in the businesses of Guayaquil

2.1. Single-use plastics in Guayaquil

In recent years the consumption of single-use plastics worldwide has increased exponentially, Ecuador is no exception for this reason the municipality of Guayaquil took the decision to issue an ordinance to reduce the use of these plastics. This ordinance regulates the use of plastic and stimulates recycling since Ecuador is one of the countries that recycle less and the municipality before this reality and the conditions of deterioration of the planet, took as an option to regulate the use of these products. For example, in our country the average one person's use of T-shirt type covers during a year is 130 covers of which only 10% are recycled. The sorbet is also one of the most used and least recycled products, so the municipality proposed that restaurants join the initiative to change their plastic sorbets for biodegradable sorbets. T-shirt covers are used to carry products and are provided to customers at points of sale. The most common sleeves are made from a type of plastic called polyethylene, a tough, lightweight and flexible synthetic resin produced from the polymerization of ethylene (ONU Environment, 2018).

The main objective of the government of Guayaquil is to improve the quality of life of its fellow citizens and in turn be a sustainable and environmentally friendly city through this ordinance. Alfredo Hoyos, president of Aseplas, agrees that this ordinance does not seek to eliminate plastic, quite on the contrary what is intended is to seek regulations that improve environmental policy, taking into account different aspects such as the circular economy, the health of citizens and most importantly recycling.

2.2. Fabrication of single-use plastics

Single use plastics can be manufactured using 4 different types of plastics depending on the characteristics you want the product to have, these are plastics: Polyethylene Terephthalate (PET), High Density Polyethylene (HDPE) and Polypropylene (PP). Once the resin with which it is going to work has been chosen, the sheet is elaborated to manufacture the desired containers. After the raw material is processed or extruded, film is obtained to manufacture the containers. This can be done through three different processes:

The first is by means of injection and blowing that consists of melting the raw material to be able to place it in a mold, then by means of blowing under pressure, the material is manipulated until arriving at the form and wished size.

The second process, called extrusion and blowing, is based on inserting the raw material into a mechanism that heats it until it melts and gives it a specific shape. Then, as in the first process, pressure blowing is used so that the plastic acquires the desired shape and size, but unlike the first, the secret of this second process is that it requires the correct temperature and pressure.

And the third extrusion and thermoforming process consists of extruding the resin to form a sheet that enters a thermoformer, in this process this sheet is thermoformed by heat and vacuum. For them a mold or matrix is used, this is the plastic sheet takes the shape of the mold (cavities) with the action of pressure and high temperature.

2.2.1. The common usage of single-use plastics.

So-called single-use plastics are those products that are used only once and then discarded. Single-use plastics include: cups, tubs, plastic cases, sherbets, bottles, spoons, cups and plastic plates. The use of these is limited to transporting food or products, or they are used to consuming a food or drink. Single-use plastics are the most

commonly used products today because of their low cost and resistance to wear and tear and waterproofing.

In recent decades these plastics have become part of our daily lives, for example if we go out to eat we use sorbets, if we need to transport food we put it in a tub, drinks come in bottles, among other examples. Gil (2018) states: “Plastics are one of the most widely used materials today. Their production and consumption have increased at a much faster rate than any other commonly used material” (p.1). These products have become very useful and indispensable in everyday life, thanks to their easy handling and practical use.

2.2.1.1. Single-use plastics: social, cultural and economic problems in Guayaquil.

According to ONU studies, by 2050, if we do not improve and become aware of our actions, there will be approximately 12 million tons of plastic waste in both marine and terrestrial ecosystems. Originating social and cultural problems that not only affect people but also animals, in the same way this would cause economic problems that in one way or another would affect businesses and companies because they should make unforeseen unscheduled expenses.

Among the social impacts are: health problems due to pollution, obstruction of sewage due to waste which results in attracting mosquitoes raising the risk of disease, release of chemicals from plastics, such as benzene, which is a carcinogen and the food chain is contaminated because when the chemicals are released, the toxins remain in the air, contaminating living beings and even food.

Among the cultural impacts are: water and soil are contaminated, death of different marine species, it is estimated that 99% of birds will have ingested plastic by 2050, the

process of photosynthesis is reduced thanks to pollution and when the seas are polluted, the surface is filled with plastic which affects the transfer of oxygen into the water. Among the economic impacts are: costs of cleaning canals and sewers, expenses in maintenance of accumulated plastic residues, the fishing, tourism and maritime transport industries suffer economic losses, substitution of their plastic products by recyclable or biodegradable products, expenditure on new materials for the production of new products and expenditure on machinery for the production of these new products.

2.3. How this ordinance has affected the economy of the production and distribution of plastics in Guayaquil

In Ecuador, the plastic industry is composed of the sector ASEPLAS (Ecuadorian Association of Plastics) and this sector is composed of 6,000 companies which 1,200 belong to ASEPLAS, the majority of plastic producing companies are located in Guayaquil. The plastic producing and distributing companies are working and thinking of ways to incorporate recyclable or biodegradable materials in their manufacturing processes, mainly in T-shirt and tub-type covers.

But, for the plastic industries this change has not been easy because they have to think of ways to reduce plastic using new materials. This has already affected that they do not comply with certain environmental and economic policies that are needed to make this change possible. Another difficulty they face is that the government does not promote a circular economy that consists of reducing, reusing and recycling.

The depletion of a number of natural resources and fossil fuels is beginning to be glimpsed. The circular economy proposes a new model of society that uses and optimizes 'stocks' and flows of materials, energy and waste. The goal is the efficiency of the use of resources. (Hoyos, 2018, párr. 13)

Its real effect of the ordinance issued by the municipality of Guayaquil lies in the fact that many single-use plastics businesses (distributors) have seen their sales decrease, causing the dismissal of people. In addition, informal businesses such as the sale of lunches, juices, and queues that normally occur in low-income sectors have seen the need to close or stop selling because the cost of substitutes is very high.

For example, 100 polypropylene plastic cups cost approximately \$0.60 ctv compared to a cardboard cup that the 100 cups cost \$2.40. This decrease in the sale of the distributors causes the factories to lower their production levels and sometimes even to take the decision to turn off their machines due to the low demand for their products, which causes a great economic loss for them. (1304 words)

Chapter III

Ecological products analysis

3.1. Ecological products

In Guayaquil, the municipality seeks to make its habitants aware of their actions with respect to the care of our planet, through laws to reduce the problem that exists today in relation to the destruction of the planet, since the conditions of the same at present are not the best due to environmental pollution.

Our planet has reached its limits, and we must act now. We are pleased that the world has responded here in Nairobi with a firm commitment to build a future in which sustainability is the primary goal of everything we do. (Msuya, 2019, párr. 11)

Analyzing this, the Municipality of Guayaquil took the initiative along with environmentalists such as Dallyana Passailaigue and the company Sambito to develop a law to encourage the production of plastic substitutes for single use that have the same characteristics of these to somehow reduce the problem that has the planet, and one of the alternatives is the manufacture of organic products.

Ecological products are a more expensive option to those single-use plastics items, but they cause less impact on pollution due to their biodegradable characteristics. These products are made from paper or natural fibers. These products can be used to make containers such as glasses, plates, cutlery, among others, in order to somehow reduce environmental pollution.

3.1.1. Fabrication of ecological products.

The manufacture of ecological or biodegradable products bases its raw material on derivatives of agricultural products, these ingredients must not be modified and may not

contain any chemical substances such as insecticides or pesticides, and since 100% natural ingredients must be used for their production process.

In order to manufacture a paper container, be it cups, sorbets, etc., the rolls of both wood and organic products (corn starch) must first be elaborated, these arrive as raw material to the factories for their respective transformation, in the case of wood products the rolls must be laminated with a thin layer of polyethylene.

On arrival in the factories, the first step is to design sheets known as “planes”. Each plane will be a new glass, then the sheets are introduced into the machines and rolled up to make the sides of the glasses, then with another sheet circles are cut to form the bottom of the same, then the machine joins the two parts with heat to form the glass. At the end the cups are sent to another machine that rolls the paper and puts it on top of the cups to create the edge.

To make a container with natural fibers a mixture of polyethylene with barley and/or agave fibers is used with the purpose of reducing the plastic, then they are shaped into molds in a thermoforming machine. These cups use 85% natural fibers and 15% polyethylene. Thanks to this, the cup is able to degrade faster than a cup made 100% of plastic.

3.1.1.1. Advantages and disadvantages of ecological products.

The manufacture of ecological products reduces pollution because, thanks to its composition, it takes 95% faster to degrade than a plastic product.

Among the advantages we find that they are 100% biodegradable products which don't use chemical substances. They are ecological materials which means that they help reduce CO2 emissions as well as are reusable, reduce environmental pollution, and are resistant to friction. Products made up of biodegradable substances are 100% friendly to

the planet and, thanks to their size and lightweight, are portable and storable.

On the other hand, among the disadvantages, we find that it is more expensive in relation to single-use plastic products. As for straws when you use them leave it soaking a long time, it begins to fall apart.

Many trees must be felled in order to satisfy the newfound demand, and this would bring the disappearance of hectares of jungles and forests, needs about 5,000 liters of water to make only 500 ecological leaves, mineral exploitation, triples the use of non-renewable energy and are not recyclable.

3.2. Ecological movements: Campaign for the elimination of single-use plastics

Today different countries around the world have joined movements against single-use plastics. The ONU stated that more than 200 countries have pledged to reduce single-use plastics by 2030. (ONU News, 2019). One of the best known movements is called “No straw please”, the aim of this movement is to gradually reduce the use of plastics to eliminate them.

In Guayaquil, this campaign has been echoed by many companies such as Supercines, Sweet&Coffee, Mi Comisariato, Chili’s, among others, which are replacing single-use plastics with ecological products.

The movement called “No sherbet please” is that when a customer orders a drink they are given without plastic sherbet or if the customer wants a sherbet they are given a paper sherbet, in order to reduce the use of single-use plastics by promoting an ecological awareness in order to improve and help the planet by reducing the risks which cause damage to it.

3.3. Circular economy

The circular economy is a system that is based on reducing, reusing and recycling. This system ensures the welfare of the environment by reusing plastics that cannot be

degraded due to their properties, reducing the production of products and making them only when necessary and recycling them so that they become environmentally friendly products and can be given a second use. Cerdá (2016) states: “Innovation in recycling technology is evolving rapidly and makes it possible to produce high quality goods with fantastic results in terms of sustainability” (p.13).

The circular economy is based on three principles, the first is based on protecting natural capital, the second principle is to improve products in the biological and technical cycles and the third principle expresses that it is necessary to demonstrate how effective it is to follow this system through projections of future results of the elimination of damages.

This economy is a viable alternative that serves to make people realize that the solution is not to eliminate single-use plastics, rather people should become aware of their actions through the use of the three “r’s” reduce, reuse and recycle.

Bringing many benefits such as reducing waste production, limiting energy consumption and decreasing resource use. (1025 words)

Conclusions

At the end of this monographic work it is concluded that:

- The ordinance that regulates single-use plastic promulgated by the municipality of Guayaquil seeks to reduce the consumption of these plastics, with the main objective of reducing environmental pollution. This ordinance affects all plastic companies located in the city of Guayaquil.
- Any company that uses in its manufacturing process raw material from petroleum resin is PP, polyethylene, etc. They have the obligation to replace these plastic materials with materials and/or products that are recyclable or biodegradable. Because of this, many factories and distribution businesses have been affected by this ordinance, since the change in technology and the scarce production of biodegradable raw materials worldwide cause the product to become drastically more expensive.
- The plastics of a single use are products that are present in our day to day and by means of processes of industrial transformation they can have other uses since one of its characteristics is to be recyclable and to have a bad disposition of the residues in origin on the part of the final consumers and a little or almost null action of the entities of governmental control these are not deposited in garbage cans or places destined for this end, on the contrary they are discarded in the streets, rivers or beaches and as consequence of this they become pollutants, reason why it is concluded that this is a cultural problem.
- Ecological products are a good option to replace plastic as they perform the same functions that these causing less impact on the environment because they are friendly and respectful with the planet, it's composition let them help to reduce the pollution that plastics cause and fulfilling with the same functions as plastic does.

- Approximately 13 million tons of plastic are discarded into the ocean each year. Today, only 10% of all plastic used and produced is recycled, 15% is incinerated and 75% ends up in the oceans. It is considered that the circular economy is a good option to improve the planet's circumstances since it involves the three "r's" that are reduce, reuse and recycle.

(350 words)

Recommendations

After having completed this monograph work it is recommended that:

- Being a cultural issue because plastic alone is not the problem, government agencies, businesses and citizens should conduct awareness campaigns in schools, colleges, neighborhoods, of the damage caused to the environment by the mismanagement of plastic waste that is not putting waste in the appropriate places.
- Being the plastic a noble product by its characteristic of recycling, the circular economy must be promoted since this is a useful economic system that helps much to the planet, according to its concept must be reduced, this is to use more environmentally friendly products, refuse, find a second use of plastic and not discard it after using it, and recycle so that through industrial processes can be reprocessed and used in other products and thus reduce pollution and accumulation of plastic waste.
- The control entities whether these municipalities or central government promote laws that help companies to import new technology at low cost for the development of biodegradable products that are friendly to the environment and thus do not continue environmental pollution.

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