COMMUNITY PARTICIPATION TO REDUCE ACCUMULATION OF PLASTIC BAGS
(CASE STUDY IN AL-KHUMS CITY , LIBYA)

Thesis

Submitted In Partial Fulfillment of the Requirements For

The Degree of Master in Environmental Sciences

Naser Ali Ahmed Alhderi

L4K00918

ENVIRONMENTAL SCIENCE STUDY PROGRAM

POST GRADUATE

UNIVERSITAS DIPONEGORO

SEMARANG

2010

THESIS

COMMUNITY PARTICIPATION TO REDUCE ACCUMULATION OF PLASTIC BAGS (CASE STUDY IN AL-KHUMS CITY , LIBYA)

By

NASER ALI AHMED ALHDERI
L4K009018

Supervision Commission

First Supervisor	Second Supervisor,
Ir.Agus Hadiyarto, MT	Dra. Hartuti Purnaweni,MPA

Chairman of
Master Program in
Environmental Science

Prof. Dr. Ir. Purwanto, DEA

LEMBAR PENGESAHAN

COMMUNITY PARTICIPATION TO REDUCE ACCUMULATION OF PLASTIC BAGS

(Case Study in Al-Khums City, Libya)

By

Naser Ali Ahmed Alhderi

Has been defended in front of the Examiner Team

on August 12, 2010

and Meets the Requirements for Acceptance

Ketua	Tanda Tangan
Ir.Agus Hadiyarto, MT	…….
Anggota,	Tanda Tangan
Dra. Hartuti Purnaweni,MPA	…….
Ir, Danny Sutrisnanto,M.Eng	…….
Dra, Sri Suryoko, M.Si	…….

PERNYATAAN

Saya menyatakan dengan sesungguhnya bawah tesis yang saya susun sebagai syarat untuk memperoleh gelar mgister dari Program Magister Ilmu Lingkungan Diponegoro Universitas seluruhnya merupakan hasil karya saya sendiri.

Adapun bagian-bagian tertentu dalam penulisan tesis yang saya kutip dari hasil karya orang lain telah dituliskan sumbernya secara jelas sesuai dengan norma, kaidah dan etika penulisan ilmiah

Apabila di kemudian hari ditemukan seluruh atau sebagian tesis ini bukan hasil karya saya sendiri atau adanya plagiat dalam bagian-bagian tertentu,saya bersedia menerima sanksi pencabutan gelar akademik yang saya sandang dan sanksi- sanksi lainnya sesuai dengan peraturan perundangan yang berlaku.

Semarang, Agustus 2010

Naser Ali Ahmed Alhderi

Curriculum Vitae

My name is Naser Ali Ahmed Alhderi, Libyan. I was born in AL-khums city / Libya in 1980.

- Secondary school / Ibrahim Al-rfahe / graduated in 1998.
- University Al- Mergeb / Al-khums / Faculty of Arts and Science, Al-khums (Geology and Geo-environment department)/graduated in 2002-2003
- Staff in Cattle Breeding Project / Al-khums (2004-2006).
- Staff in Syuhada Al-Marqab High School / Al-khums (2006-2008)

ABSTRACT

Plastic bags are one of the most common items used by people around the world. Shoppers worldwide are using around 500 billion to 1 trillion plastic bags per year. Plastic bags however, are made from oil. The carbon footprint of plastic (LDPE or PET, polyethylene) is about 6 kg CO2 per kg of plastic. This study was done to determine plastic bags use in the Al-khums City, to know the accumulation of plastic bags waste, the awareness of the people about the accumulation of plastic bags waste in the environment, and how to minimize plastic bags use by the people who live in Al-khums City. The Social Cognitive Theory (SCT) was used in this research to explain the relation between personal, behavior and environment factors of the community in Al-khums City in relation to the issue. In total, the 73,520 families who live there consumed 238,204,800 of plastic bags in one year. There were 18,132,470 plastic bags disposed by shop owners and 120,793,360 plastic bags disposed by the customers and public in one year and 760,800Kg emissions CO2 for two factories in one year. There was a strong awareness about the negative effects caused by plastic bags to the environment. Albeit shop owners, customers and public of the city were committed and willing to participate in minimizing the use of plastic bags, no concrete step has been taken because no alternative was available. This study wants to suggest that the government take a bigger role in regulating the production of plastic bags and provide people with alternatives such as biodegradable shopping bags..

Keywords: plastic bags, accumulation, community, Al-khums, Libya**.**

ABSTRAK

Kantung plastik adalah salah satu benda yang paling sering digunakan oleh orang-orang di seluruh dunia. Para pembeli di dunia menggunakan sekitar 500 milyar sampai satu trilyun kantung plastik setiap tahun. Sayangnya kantung plastik dibuat dari minyak dan memiliki carbon footprint sebesar 6 kg CO2 per kilogram plastik. Penelitian ini dilakukan untuk menentukan jumlah penggunaan kantong plastik di Kota Al-khums, untuk mengetahui akumulasi limbah kantong plastik, kesadaran masyarakat tentang akumulasi sampah kantong plastik di lingkungan, dan bagaimana untuk meminimalkan kantong plastik digunakan oleh orang yang tinggal di kota Al-khums. Teori Kognitif Sosial (SCT) digunakan dalam penelitian ini untuk menjelaskan hubungan antara pribadi, perilaku dan faktor lingkungan masyarakat di kota Al-khums dalam hubungannya dengan masalah ini. Secara keseluruhan, 73.520 keluarga yang tinggal di sana mengkonsumsi 238.204.800 kantong plastik setiap tahun. Kantung plastic yang dibuang oleh para pemilik took berjumlah 18,132,470, sedangkan jumlah yang dibuang pelanggan dan publik sebesar 120,793,360 buah. dan 760,800Kg pembuangan CO2 oleh dua pabrik dalam setahun. Ada kesadaran yang kuat tentang dampak negatif yang ditimbulkan oleh tas plastik terhadap lingkungan. Meskipun pemilik toko, pelanggan dan publik kota Al-khums berkomitmen dan bersedia untuk berpartisipasi dalam mengurangi penggunaan kantong plastic, belum ada partisipasi yang nyata dalam hal ini karena tidak tersedianya alternatif. Studi ini merekomendasikan agar pemerintah mengambil peran lebih besar dalam mengatur standar produksi kantong plastik dan menyediakan alternatif tas belanja yang lebih ramah lingkungan ..

Kata kunci: kantung plastik, akumulasi, masyarakat, Al-khums, Libya.

ACKNOWLEDGMENT

Alhamdulillah praise to Allah the Almighty for this blessing that this report is finally completed.

I would like to express the deepest appreciation to my supervisor, Ir Agus Hadiyarto, MT. who has the attitude and the substance of a genius: he continually and convincingly conveyed a spirit of adventure in regard to research, and an excitement in regard to teaching. Without his guidance and persistent help this dissertation would not have been possible.

I would like to express my deepest gratitude to my second supervisor, Dra. Hartuti Purnaweni for her support and guidance throughout the research. Her continued support led me to the right way.

My sincere thanks to my family, brothers, sisters and especially my mother and to memory of my father.

Beside this, I would like to thanks my favorite teacher Dra. Hartuti Purnaweni for her comments, suggestion, and encouragement throughout the first steps of this report, and also to all my classmates in the program of Environmental Science in Diponegoro University, and finally to the beautiful Semarang city

SEMARANG ……

NASER ALI AHMED ALHDERI, L4K009018

CONTENTS

List of Figures **page No**

List of Tables **Page No**

List of Appendixes

CHAPTER I

INTRODUCTION

1.1. Background

Human being needs lots of things in their life, both for their survival, and also for their convenience. Modern life demands more and more conveniences, since modern people strive for more and more satisfaction in their life. Due to this, many new items are invented and introduced to fulfill the ever growing human needs. One of the most common items in our modern world is the ubiquitous plastic bag. Highly convenient, strong and inexpensive, plastic grocery bags are appealing to both customers and businesses as a reliable way to deliver goods, such as from the store to home. However, there are several issues associated with the production, use, and disposal of plastic grocery bags which may not be initially apparent to most users, but which are nonetheless extremely important. By assessing the lifecycle of plastic bags, we can better understand the full ecological footprint of the plastic bag, and find more effective means of dealing with the associated negative impacts [24].

Plastic bags have been a part of daily life in developed countries since their introduction in 1977 [24], and in more recent years, their use has spread too many developing countries as well [4]. Unfortunately, the most common final resting place for garbage bags is the garbage bin, resulting in countless numbers of bags filling landfills and spilling over onto essentially every other surface of the planet [24]. It is the very prevalence of these bags that result in several critical environmental and social impacts associated with their use and immediate disposal. It is not fully consciously known, however, that plastic is so durable that it can take hundreds of years to break down at sea, and some types never truly biodegrade at water body [24]. Therefore, their environmental impacts are significant.

The impact of the human factor on the environment has reached such a level that society is now trying to do everything possible (and sometimes impossible) just to prevent the world's destruction along with its inhabitants. Thus, all governments are morally being asked to reduce their output of contaminants until suitable environment quality levels are reached. The newest technology used for this purpose, widely known as consists of

methods and inventions which are aimed to reducing contaminants of air, ground and water. This is achieved either through multiple processing of the contaminants until they have reached harmless levels, or through inventions that would only contaminate the environment less or not at all. There has also been an enormous effort to use alternative energy sources to preserve the environment, such as wind, tidal and solar power as well as geothermal, nuclear, hydroelectric and biomass [2].

Plastic bags are becoming a major environmental concern in many countries around the world. The bags have blocked drains and caused severe floods over the last couple of decades in Bangladesh, costing thousands of people their lives. They have, rather ironically, assumed a new identity as the 'national flower' of South Africa because they are so often caught up in trees and fences. Even in Ireland the image was seriously threatened by intense littering of plastic bags - until halting measures were taken [4].

The environmental implications of polyethylene bags, that take hundreds of years to decompose, are harsh. Negative outcomes include: the wasted resources locked away in the millions of plastic bags in landfills, the littering of landscapes and waterways, threats to wildlife (100,000 mammals and turtles are killed by plastic debris annually), and toxic gas emissions through their burning. Numbers of plastic bags used by shoppers are also an indicator of our consumption. [27]

Plastic is made from petroleum by-products. Raw materials used in the manufacture of plastics are petroleum, natural gas, coal, and some salts. Plastic makes around 4% of all oil products. It is extracted in the process of oil refining in petrochemical plants, which is a major and complex process producing also a lot of contaminating material.

The manufacture of plastic uses organic chemicals as raw materials in a long series of production operations. Polyethylene consists of five types. Plastic manufactured from one of these species is called polyethylene - ethylene. Polyethylene is a long series of atoms of carbon and hydrogen which needs hundreds of years to dismantle in natural environment. Although plastic bags make up only a small percentage of all litter, the impact of these bags is nevertheless significant. Plastic bags create visual pollution problems and can have harmful effects on aquatic and terrestrial animals. Plastic bags are

particularly noticeable components of the litter stream due to their size and the long time it needs to fully break down [27].

One of the most important issues in the world today is global warming. Carbon dioxide (CO2) is one of the gases that contribute to global warming. One of the sources of CO2 emission is the usage of fossil fuels like oil. Plastic is made from oil, thus production and incineration of plastic emit also CO2. In fact, The production of 1 kg of polyethylene (PET or LDPE), requires the equivalent of 2 kg of oil for energy and raw material .Polyethylene PE is the most commonly used plastic for plastic bags. Burning 1 kg of oil creates about 3 kg of carbon dioxide. In other words: Per kg of plastic, about 6 kg carbon dioxide is created during production and incineration [9] [3].

The accepted standard thickness of plastic bags in the world is seven Micros. This standard thickness enables the plastic bags to be used more than one time [2] ,and therefore to make them more environmentally friendly.

For the last 5 years the Government of Libya has been trying to find solutions on how to reduce the present pollution effect of plastic bags on the environment. In the city of Al-Khums, experts and specialists in the areas of environment have warned about the effects of plastic bags use by the public in the bakeries and grocery stores in Al-Khums City. The problem can already be described as “disaster” due to the absence of serious response from the state to deal with the problem [22].

Environmental effects of plastic bags are many. Because plastic bags are not biodegradable quickly like some other wastes, they would eventually accumulate for a thousand years in the environment as an organic pollutant. This means that their waste, which contains many materials such as carbon, hydrogen, chlorine, nitrogen, and others, would pose a serious threat to the environment. The negative effects of plastic bags waste can be explained as follows [27]:

1- The light weight of the plastic bags counts as the most important factor in the contamination of open spaces, public squares, the main streets within and outside the cities, on the beach and the sea. Excessive consumption of plastic bags thus makes this highly difficult to decompose material a serious problem.

2- The ease in which plastic bags can fly in the air and spread in vast area is an impediment of the effort to compile and dispose them. This will then bring disruption to the general appearance of the premises where there are found to create a so called “visual pollution”.

3- Plastic bags can stick to trees and plants and block out light from some parts of the plants, causing the failure to complete the process of photosynthesis.

4- The cattle and cows eating plastic bags encountered during their grazing exposes the animals to disease and death.

5- The plastic bags buried in the soil will create the formation of unnatural layer of plastic which then acts as a buffer within the soil, causing rain to dwell only in the upper part of the soil and thus preventing the access of water and fertilizer required to the bottom of the soil.

6- Accumulation of plastic bags waste will provide an environment for parasites and pathogens because plastic is a substance which can float above the surface of the water for a long time.

7- In the case of burning the plastic bags waste, we will also release chlorine, carbon dioxide and other gaseous compounds, as well as acids and other toxic compounds harmful to human health.

8- Their presence and spread in the coastal areas is also a threat to the marine environment and marine organisms [27].

The problem of plastic bags accumulation in Libya is one of the biggest environmental problems to which the authorities there have not been able to find a solution until this moment. Like other big cities in Libya, the city of Al-Khums, which is situated at 120 kilometers east of the capital Tripoli, is currently struggling with this problem. The reason for this is the frequent use of plastic bags by the people of the city in their many daily activities. Plastic bags, which are produced in high quantity, generate a lot of money for the factory producing them. However, there are no plans to address the problem, and apparently the people still do not feel the impact that these bags have on the

degradation of the environment. The city government hasn't acted on this matter also, as seen in the fact that there is no policy regulating the production, use and disposal of plastic bags as yet [22].

1.2. Research Problem

Materials used for making plastic bags can remain in the environment for centuries, while its usefulness can only last for only an hour or two. So, in exchange for something that will serve us only in the matter of hours, we will have used oil and other pollutants used in their production which will remain in the land without any benefit for hundreds of years.

The questions now are: Does this make sense to keep making plastic bags excessively in Al-Khums City? What are the people in Al-Khums City currently doing with plastic bags? What should they do with them in the future?

1.3. Research Question

The problems in this research are:

1- What kinds of plastic bags used in Al-Khums City?
2- How is the accumulation of plastic bags in the environment?
3- How is the people's awareness about the accumulation of plastic bags waste in the environment?
4- What can the community in Al-Khums City do to reduce the effects that plastic bags waste has to the environment?

1.4. Research Objectives

The objectives in this research are:

1- To identify plastic bags used in Al-Khums City and emission CO2.
2- To count the accumulation of plastic bags waste in the environment of Al-khums City.

3- To study people's awareness on the accumulation of plastic bags use in the environment.
4- To study how to reduce plastic bags use in the community.

1.5. Benefit of the Study

1- To give scientific contribution in creating a social awareness of the negative impacts which plastic bags can have to the environment.

2- The study is also expected to give a better understanding on the impact of plastic bags accumulation to the environment.

3- To give recommendation on how to reduce the accumulation of plastic bags to the environment so that their impact on the environment can be minimized.