EVALUATION OF ENVIRONMENTAL IMPACT FOR PHARMACEUTICAL INDUSTRY

Submitted By

Soha Nabil El-Mashad
B.Sc. of Chemical Engineering, Cairo University, 1994

A thesis submitted in Partial Fulfillment
Of
The Requirement for the Master Degree
In
Environmental Science

Department of Environmental Engineering Science
Institute of Environmental Studies and Research
Ain Shams University

2011

APPROVAL SHEET

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بسم الله الرحمن الرحيم

(سبحانك لا علم لنا إلا ما
علمتنا
إنك أنت العليم الحكيم)

Acknowledgement

All thanks to my supervisors ;specially my main supervisor **Prof. Dr. M. El-Hosseiny El-Nadi** for all his effort and time that supported me to achieve my goal; and my family who supported me and last but not least my parents who made me love science and success .

ABSTRACT

The pollution resulting from pharmaceutical industry sector threw its sheds on air, water and soil . Any treatment will not lead us to sustainable environment and resources protection; Environmental impact assessment process is the only solution to make our pollution parameters within the standard limits .

The study introduced all traditional methods for pollution reduction in the pharmaceutical industry sector and compared the measurements with a newly established pharmaceutical plant that carried an environmental impact assessment before implementation .

Finally, after all discussion certain modification are suggested concerning the recent form adopted for the environmental impact assessment process to address each production line enclosed within any pharmaceutical plant for reaching maximum sustainable development .

SUMMARY

1.1 INTRODUCTION

Environmental Pollution is considered the most dangerous and impressive problem of this century and it threw its shed on planet earth. The environment is a complicated dynamic system, with many interacting components . There exist no limit between different matters (solid – liquid – gaseous); which is the case when dealing with any kind of pollution.

Rapid growth in industrialization have its impact on the environment, mainly industrial pollution results in large quantities of hazardous materials and wastes, nuclear activities, radiation and noise pollution which affects human health . Pollution Prevention Techniques will never ensure clean environment; since elimination of any pollution before production is better than any remediation .

In recent decades, governments have responded to the changing community concerns regarding environmental, social and health matters, and have developed and extended a broader range of tools to be used in environmental management; Environmental Impact Assessment (EIA), as one of most impressive tool in environmental management .

Environmental Impact Assessment is a formal process for identifying the likely effects of particular activities or projects on the environment , human health and welfare. It also include the development of mitigation and monitoring measures . The main benefit of this process is to avoid problems before they occur and to provide decision makers with alternatives .

1.2 STATEMENT OF PROBLEM

We will consider pharmaceutical industry to be our case study and we will study all kind of pollution emerging from it as air ,water and solid pollution .

As pharmaceutical industry sector is considered to be a very important sector with respect to its products and wastes as well . Pharmaceutical industry pollution problems are considered to be a sector of the chemical industry pollution . This industry is characterized with a varity in quality and quantity of residue effluents due to the various manufacturing procedures .

Environmental impact assessment is a process that involves a series of stages; Screening is the first procedure

conducted in this process to determine whether a full EIA is necessary or not . The next step is scoping which include alternatives that should get attention, impacts, methods used for predicting the impacts, mitigation measures that have to be developed . The scoping phase often ends in the issuing of the so-called guidelines or terms of reference (TOR) containing the specifications . Next, the consideration of alternatives provides for the examination of different mechanisms to achieve a stated objective. At last, public involvement is important in order to avoid delay or rejection of the project .

Carrying environmental impact assessment for pharmaceutical industry ensure both sustainable development and cleaner environment . A full detailed study of how to modify recent procedures of environmental impact assessment for pharmaceutical industry is carried .

1.3 OBJECTIVE

The research aim for : -

1.3.1 Studying of major environmental problems resulting from pharmaceutical industry and set a solution for them .

1.3.2 Studying and implementing of an environmental impact assessment steps of processes concerning pharmaceutical industry .

1.3.3 Addition or elimination of technical issues addressing EIA forms set by the law 4/1994 for environment protection to reach a satisfactory limit concerning environment protection .

1.4 SCOPE

The study is divided into two parts :

1.5 THEROTICAL PART

- Studying different manufacturing processes in pharmaceutical industry .
- Studying of previous area field experiences .
- Studying and analyzing of practical field data .
- Discussion of results and conclusions .

1.5.1 PRACTICAL PART

- Studying of pharmaceutical industry in Egypt and environmental impact assessment procedures taken .

- Studying of a recent pharmaceutical factory and its environmental impact assessment study .
- Studying of proposed EIA issues corresponding to each different production line in any pharmaceutical factory .

1.6 THESIS ORGANIZATION

1.6.1 CHAPTER I

It covers the study background and the problem that covered by this thesis illustrating its important points and then present the study objective with showing the work scope and at the end present the thesis organization.

1.6.2 CHAPTER II

It presents all the previous studies addressing the environmental impact assessment process and on the other hand describes the different pharmaceutical processes and its waste minimization techniques .

1.6.3 CHAPTER III

It addresses the methodology of study and spread the study program and finally present the proposed modular for environmental impact assessment for pharmaceutical industry .

1.6.4 CHAPTER IV

It presents the measurements results for air pollution, noise pollution, liquid pollution and solid pollution and highlighting the privilege of carrying environmental impact assessment process before implementation than carrying any compliance later .

1.5.5 CHAPTER V

It addresses the interpretation of the results and final discussion . At the end, it include the references .

1.5.6 CHAPTER VI

It includes conclusion and recommendations .

تقييم المردود البيئي لصناعة الدواء
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صفحة الموافقة على الرسالة

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قسم العلوم الهندسية البيئية

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المستخلص

يلقى التلوث الناتج عن الصناعات الدوائية ظلاله على الهواء، الماء ،والتربة . تعتبر أى معالجة لاحقة لا تتماشى مع حماية المصادر وأسس التنمية المستدامة ، لذا تعتبر عملية تقييم الأثر البيئى هى الحل الأوحد لتفادى وجود أى ملوثات للنشاط مسبقا .

أستعرضت الرسالة كل الطرق التقليدية لمعالجة المخلفات الناتجة عن الصناعات الدوائية وقارنت الإنبعاثات التى تم قياسها بقياسات مصنع دواء قام بإجراء عملية تقييم الأثر البيئى قبل الإنشاء .

أخيرا ، بعد مناقشة النتائج تم إقتراح بعد الإضافات الخاصة بعملية تقييم الأثر البيئى للصناعات الدوائية مرتبطة بخطوط الإنتاج لتعظيم المردود البيئى لتلك الصناعة .

Summary

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