Research Journal of Recent Sciences _____ ISSN 2277-2502
Vol. **2(ISC-2012),** 54-57 **(2013)** *Res.J.Recent.Sci.*

Review Paper

An Economical and Ecological Industrial Management for the Development, India (A tentative plan-Agra Industrial Ecosystem)

Tandon R[1], Tandon H[2] and Agarwal A[3]
[1]MBA, Sikkim Manipal University, INDIA
[2]Hindustan College of Science and Technology, INDIA
[3]Dept. of Chemistry, Faculty of Engineering and Technology (FET), Agra College, Agra, INDIA

Available online at: www.isca.in
Received 24th November 2012, revised 18th January 2013, accepted 14th February 2013

Abstract

Chemicals approximately always affect our environment, so our industry seems to be a curse for the nature. The concept in Industrial Ecological Management is analogy of industrial system to natural ecological systems. It presents an ecological and ecofriendly approach. In the industrial ecological system, industry should be considered as an interacting system rather than isolated components.The waste producing industries should be connected into an operating web that minimizes the total amount of industrial material that goes to the waste, disposal sinks or lost in intermediate processes. In this idea, waste should be considered as a potential useful resource. An ideal industrial ecological system developed in the city of Kalundborg, Denmark, can be an example to develop our nation and our Taj city in an ecofriendly way for the industry.

Keywords: Ecosystem, industrial waste, ecological management and economical management.

Introduction

Two hundred years ago, industry changed from a small, labor-intensive, in obtrusive activity to one that has become large, obtrusive, and potentially destructive to the resources that support it[1]. The recent years the concepts of Industrial Ecology have been the basis for the development of both innovative academic programs and research projects and practical applications[2].

Ecological industrial policy is a modernization strategy for economics and society in terms of sustainable production and development. It aims to replace the material and energetic base of our economies by replacing finite with renewable raw materials, and by developing renewable energy. That not only contributes to achieving a more environment- and citizens-friendly economy in Europe, but also to the formation of a transferable new model of worldwide economic development[3]. Healthy ecosystems provide vital goods and services to humans and other organisms. There are two major ways of reducing negative human impact and enhancing ecosystem services and the first of these is environmental management. This direct approach is based largely on information gained from earth science, environmental science and conservation biology. However, this is management at the end of a long series of indirect causal factors that are initiated by human consumption, so a second approach is through demand management of human resource use.

Management of human consumption of resources is an indirect approach based largely on information gained from economics. Herman Daly has suggested three broad criteria for ecological sustainability: renewable resources should provide a sustainable yield (the rate of harvest should not exceed the rate of regeneration); for non-renewable resources there should be equivalent development of renewable substitutes; waste generation should not exceed the assimilative capacity of the environment[4].

Present Industrial Negative Aspect (Industrial Pollution): Industrial pollution is pollution which can be directly linked with industry. This form of pollution is one of the leading causes of pollution Because of its size and scope, industrial pollution is a serious problem for the entire planet. This form of pollution dates back to antiquity, but widespread industrial pollution accelerated rapidly in the 1800s, with the start of the Industrial Revolution. The Industrial Revolution mechanized means of production, allowing for a much greater volume of production, and generating a corresponding increase in pollution[5].

There are a number of forms of industrial pollution. Most common is water and air pollution, caused by industrial waste... Industrial pollution can cause impact on health, and it can enter the human body, causing problems. From the point of industrial pollution, industries should be considered as interacting systems rather than isolated components therefore different waste producing processes plants or industries should be connected into a web that minimizes the total amount of industrial material that goes to the waste disposal processes (i.e., pollution prevention).

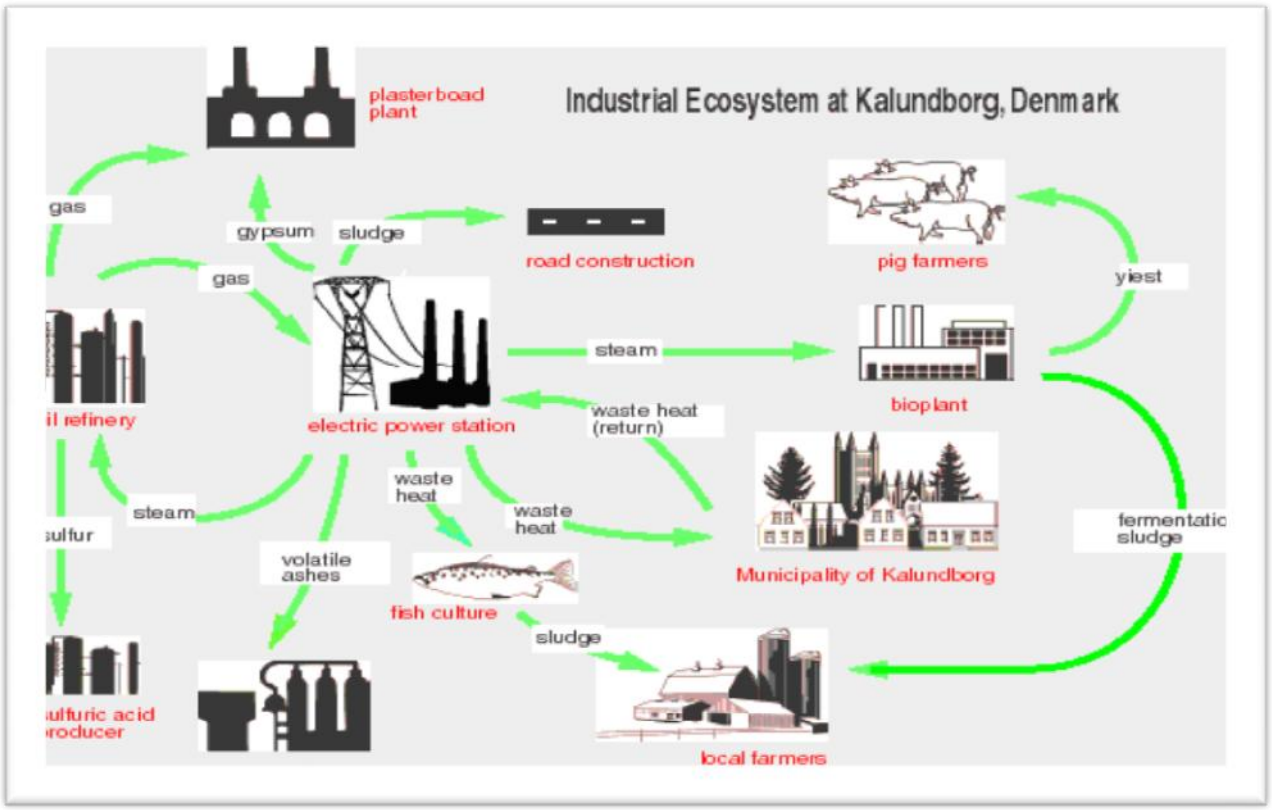

Figure-1
Industrial complex established in the city of Kalundborg, Denmark[6]

Figure-1 provides an excellent example of industrial ecology concept in this a refinery supplies gas to a power plant and plastic board company for their energy needs the steam from the power plant is sent to a bio technology plant and into a direct heating system of the city Lower temperature energy goes to an experimental fish farm the gypsum produced in the desulphurization unit of the power plant is used by the plastic board manufacturing unit By re using energy and materials this industrial eco system at Kalundborg saves 19,000 tones oil, 30,000 tonnes of coal and 600,000 m tones of water every year thereby saving about 14 million US $ per year thus they have gone beyond traditional compliance avoiding pollution they have literally shifted from end of the pipe pollution control to front end pollution prevention by creative design for ecofriendly environment[7]. Industrial ecosystem is based upon a similarity of industrial systems to natural ecological systems. It offers a cyclic system within which environmental problems can be managed in nature[6]. Industrial symbioses (ISs) and eco-industrial parks (EIPs) are key concepts of industrial ecology (IE). The aim of ISs and EIPs is to minimize inefficient material and energy use by utilizing local by-product and energyflows[8].

Development of AGRA INDUSTRIAL ecosystem: Agra at present has approximated nil industries because of Tajmahal (it's the pride of Agraties). Industrial ecosystem is a great solution for simultaneous development of industries as well as historical monuments. In the next page we have proposed a tentative plane for Agra Industrial Ecosystem (As depicted in figure-2). Here the Taj is in the centre with Taj Eco-zone around it. It covers well organized tourism industry which if promoted by the government with complete political- will can generate a large economical revenue. From this interconnecting web we can solve several problems like the Yamuna pollution, Potable Water, Organic Manure etc.

Ecological Engineering: It is especially needed as conventional energy sources diminish and amplification of nature's ecosystem services is needed even more. Firms must develop in the restoration of streams, rivers, lakes, forests, grasslands, and wetlands, the rehabilitation of mine lands and urban Brownfield's, and the creation of treatment wetlands and phytoremediation sites. The perfect synchronization of education and practice is beginning to develop the nation[9].

Conclusion

The discipline of industrial ecology is to a large part based on the implicit assumption that if "we just get our technologies right", the problems of environmental pollution and unsustainability will be solved. This is the reason why most current research in industrial ecology is focused on

technological innovation, etc. This simplistic view has been recently questioned by Huesemann and Huesemann[10].

The concept of ecological industrial policy stands in the tradition of ideas about sustainable development which link the economic goal of growth with the ecological requirements of climate protection and resource conservation. Instead of playing economy and ecology off against each other, we need to finally under-stand the economic potential inherent in the necessary ecological structural change: new growth, new value creation, new products and processes and new jobs are all possible. Industrial ecology promotes an industrial energy cycle to minimizing adverse environmental effects for effective implementation of industrial ecosystem concept, several changes in industrial systems minimizing wastage of raw materials and developing useful applications for waste products and recycling of the manufactured products. The web of waste recycling and reuse found in natural systems and try to explore the possibility of applying them in industrial context but the Obstruction in implementation: Political will and Initial heavy investment of money. It is our tentative plan and idea to develop our country starting from our city.

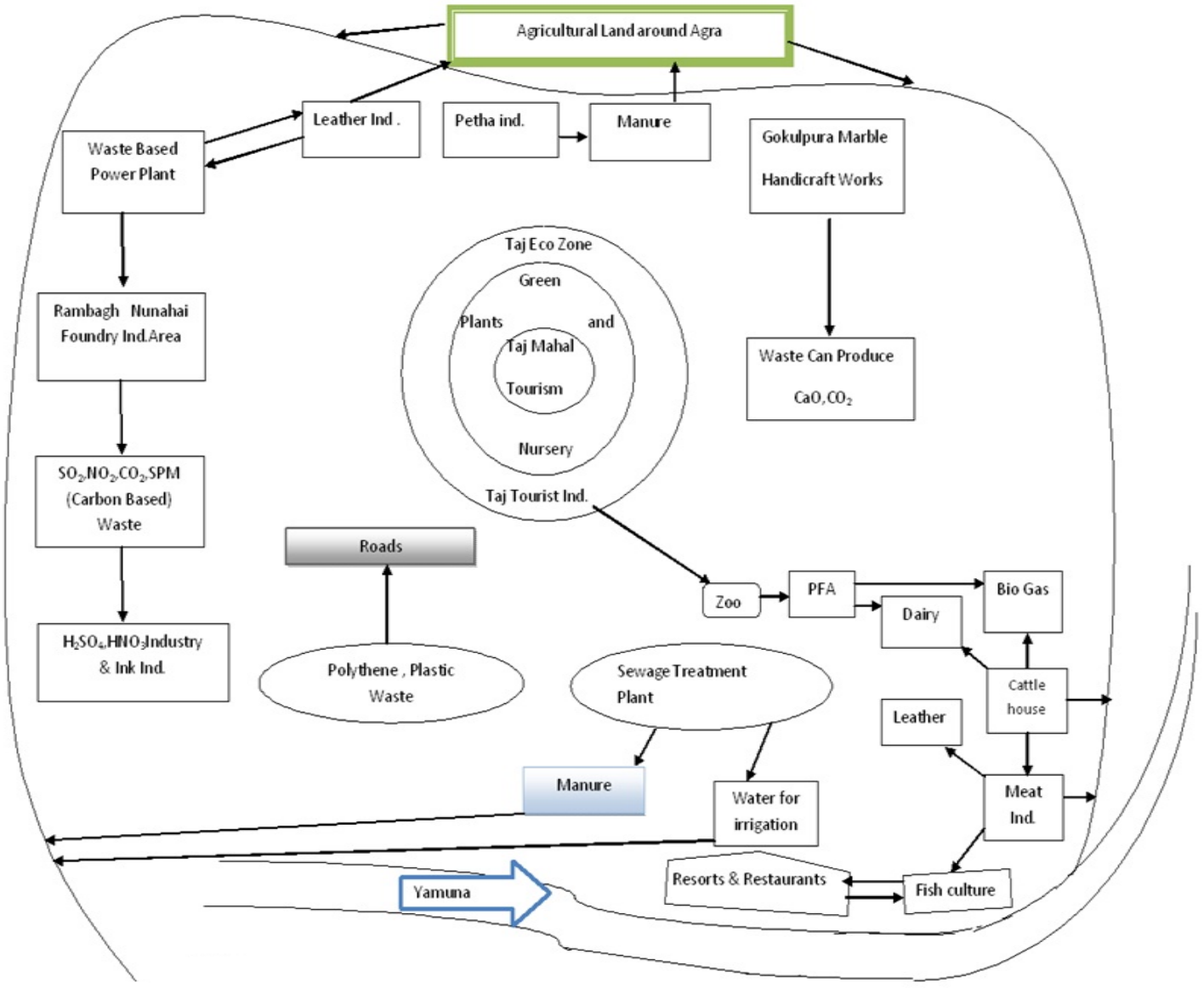

Figure-2

A Tentative Plan for Agra Industrial Eco System (An Analogy of Industrial Eco System at Kalundborg, Denmark)

Acknowledgement

We gratefully acknowledge our research group members' (360^0prg) for their critical evaluation of the Manuscript, useful comments and suggestions. We are thanks to Mr. Devendra Singh (Dev Computer Education Society), Dayal Bagh, Agra, India

References

1. L. W. Jelinski, T. E. Graedel, R. A. Laudise, D. W. Mccall and C.K.N. Patel, Industrial ecology, Concepts and approaches, Proc. Nati. Acad. Sci. USA, **89,** 793-797 **(1992)**

2. www.en.mahidol.ac **(2012)**

3. Ecological industrial policy as a key element of a sustainable economy in Europe, Matt hias Machnig Ecological industrial policy **(2012)**

4. Daly H.E, Toward some operational principles of sustainable development., *Ecological Economics,* **2,** 1–6, **(1990)**

5. http://www.wisegeek.org/what-is-industrial-pollution. htm **(2012)**

6. R-http://newcity.ca/Media/Kalundborg.gif **(2012)**

7. H. Kaur, Environmental Studies, pragati Edition, unit 6, social issues and the environment, 245 **(2010)**

8. Promoting Transformation towards Sustainable Consumption and Production in a Resource and Energy Intensive Economy - the Case of Finland, Industrial symbiosis and the policy instruments of sustainable consumption and production, *Journal of Cleaner Production*, **19(16),** 1865–1875, (**2011)**

9. Ecological Engineering, Its Development, Applications and Challenges, **45,** 5–12 **(2012)**

10. Huesemann Michael H. and Joyce A. Huesemann. *Technofix, Why Technology Won't Save Us or the Environment*, New Society Publishers, Canada, 464 **(2011)**