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Observations on the Role of Assamese Women in Business Entrepreneurship

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Abstracts

Role of Assamese women in business in Assam is evident, however few literatures have been published regarding their entrepreneurship inputs. Entrepreneurship is not only a business privilege, but a respectful social status, and opportunity to influence the decision-makers power about many women equality issues in the province of Assam.

In this field observation empirical study, we explore the role of Assam woman and how she could influence her community with her unique identity in the field of business. The study recommends further relation between women empowerment and the establishment of the inner quality, inner power of women in front of society.

Keywords: Assam, India, Women in Assam, Business Entrepreneurship, Women Entrepreneurs, Resilience Economy.

1 Introduction

The topic we are discussing is partly about women empowerment. However, the first thing comes to our mind is "what is women empowerment? "We often see girls face several social problems like social inequality, domestic violence etc. For that, many women come out to protest against this picketing against this, to earn identity, gaining gender equality.

I cannot ignore that protests have importance; it can impact people's mind, but up to what extent? Can only protest give all the rights, respectful social status, and decision making power in this male dominating society?

I think "no" we have to come out towards society to make our identity in every field, I think actual meaning of women empowerment is to establish the inner quality, inner power of women in front of the society. Buheji (2018a).

2 Research Observations

A collection of field observations was made by the researcher about the Assamese women's participation in the business sector and some beneficial sites to invest in for future empowerment programs. Traditionally the role of women in India in decision making is very

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limited, and Assam has not been the exception. Therefore, the very first goal of women entrepreneurship is to gain economic independence, which will provide women with sense of pride and confidence. Hence, one could say that women entrepreneurship is the first step towards women empowerment. Despite having 48.88% of women population of Assam, the women entrepreneurs account for only 18% of the total entrepreneurs in the region. Dutta (2017).

Naturally, Assam is rich in flora and fauna. Assam has agricultural sector that includes varieties like rice, tea, jute, spices, vegetable fruits, medicinal plants, fishery and many more. From these natural and organic natural raw materials women are running self-help groups a small scale industry of juice, pickles. These women work mostly in whole grind spices, agarbatti, etc.

Assam is very popular for its organic textile industry. It is very ancient industry, especially Assam handloom industry which are based on Eri, Muga and Pat. Such (silk) tread can be found only on Assam, as shown in Figure (1).

Figure (1) shows a type of Assam Silk.

We get this thread from moths, and mullabery leaves are feed to these moths. Traditionally women waves mekhla sador, tribal wears like ribi gaseg dakhna arnai cotton gamusa. Such silk has a particular demand, as such pure silk found only in Assam. Besides this now adays women started to make bags, swalls, chappals and many other product, as show in Figure (2).

Figure (2) Shows other uses of Assam Silk.

The importance of this study is emphasised by the importance of environmental safety in the continuity of generations and ensuring the quality of their lives. The preservation of the

environment from the massive expansion of industrial activity is an urgent necessity in light of the adverse effects that this expansion has left. For industrial production, and to include the environmental dimension in the production processes in order to preserve natural resources from depletion and thus guarantee the right of future generations of resources.

3 Objectives of the Study

This study aims to shed light on the industrial ecology and ecological industrial gardens as a modern model that coincides with the escalation of the environmental problems known by the world with the presentation of one of the pioneering experiments in the field of industrial ecology in order to benefit from these experiments in industrial areas and avoid the effects Environmental impact of the development of these areas.

4 Literature Review

4.1 The First axis: Basic Concepts about the Quality of Life and its Indicators

The researchers' interest in the concept of quality of life has increased since the beginning of the second half of the 20th century as a concept related to positive psychology, which came in response to the importance of positive outlook on the lives of individuals as an alternative to the great emphasis given by psychologists to the negative aspects of individual life. The positive aspects of personality, and all that leads to improving the quality of life The studies of the last century have confirmed that the positive side in the human personality is more prominent from the negative side, and that these two aspects do not necessarily represent two opposite directions, Locke humanitarian between them, according to many factors associated with this behaviour.

4.1.1 The emergence and Evolution of Quality of Life

Aristotle's Code of Ethics (322-384 BC) is one of the sources that dealt with the definition of quality of life. He said that both the public, the rascals and the upper class are aware of the good life in one way. They are happy, but the components of happiness are different. While others say it is also common that the individual himself says different things at different times when the prey of the disease, it is believed that happiness is health and when the poor see the happiness in wealth and Aristotle believes that the life Well-being is a state of consciousness, and a kind of activity and so express Talk only quality of life.
The quality of life became an important priority for Western societies after the Second World War. The concept was introduced into the lexicon of vocabulary and was used to express a life of peace, which consisted of several components: work, housing, environment and health, the beginning of the 1980s and the beginning of the 1990s Products, quality of outputs and the entry and application of quality standards in many fields: industry, agriculture, economics, demand, politics, sociology and psychological studies, as the

outcome of this revolution is to increase research interest in studying the concept of quality of life in the previous fields.

4.1.2 Definition of Quality of Life

There are many definitions of quality of life, including:
• WHO defines the quality of life as an individual's perception of his or her way of life in the context of the culture and values systems of the society in which he lives, and the relationship of this awareness to his goals, expectations and level of interest.
Harman (1996) points to a concept that emerged in the mid-1960s, and was widely used in various studies as one of the indicators of attention to individual well-being in all fields. The concept of quality of life has emerged in the majority of societies as a means of quantité The quality of life, the quality of raw materials, quality of married life, the quality of the last age, the quality of education and the quality of the future, have been widely used in recent years in all fields.
Snoek (2000) believes that the quality of life is an excellent ability to employ the potential of human mental and creative and enrich his soul to reflect his emotions and feelings and human values, and the outcome is the quality of life and quality of the community and this is through the school families, the university and the working environment and by focusing on three critical axes: education and training , And as Frank defines it as an individual's perception of many experiences and in the broad sense of the individual's satisfaction with the necessities of life such as food, housing and the accompanying sense of accomplishment, happiness and quality of life in the narrow sense of the body free of physical disabilities.
The quality of life can be defined as the enjoyment of physical conditions, sense of well-being, the satisfaction of needs, satisfaction with life, positive emotional life, positive physical health, sense of happiness and a harmonious life between human essence and prevailing values in society.

4.1.3 Quality of Life Indicators

The need for quality of life indicators in modern societies is to measure the outcome of development plans on the life of the individual in society. The indicators of development are not only income but also the quality of life of the citizen. The interest in the quality of life includes acknowledging that development is not only economic development but social development Personal development of individuals and environmental development surrounding them. The indicators of quality of life are as follows :

-Economic Indicators: It relates to four economic indicators, including the average annual household expenditure, the dependency ratio, the ownership of assets and the ownership of durable goods.

- Social Indicators:
It includes:
- availability and quality of health services;
- Availability of educational and cultural material to any person (availability of educational institutions, training and training centres, illiteracy rates);
- Provide suitable employment opportunities;

- Provide adequate housing conditions.

-Environmental Indicators:

These are the indicators that relate to the environment surrounding the individual from the levels of pollution or the levels of cleanliness that exist. Unprotected water, natural sunlight and clean air all have a healthy health community, and the more the individual maintains the sources of his environment, the better his quality of life.

a. Air Quality Indicator: It relates to the extent of its impact on public health, the extent of its impact on the exercise of external activities and its impact on tourism and tourists.

B. Water Quality Indicator: It relates to the multiple uses of water for drinking and other purposes, including recreation, water consumption rates, consumption patterns and maintenance of water sources that ensure availability for future uses.

C. Land Quality Indicator: relate to sufficient areas for housing construction, spaces between buildings, and the presence of green spaces that reduce pollution factors.

4.2 The Second Axis: The Role of Industrial Ecological Parks in Raising the Quality of Life

With the intensification of competition in the industrial zones and the development of industrial activity, as well as the development of sustainability concepts, the importance of developing sustainable and ecological planning and planning strategies, which was later embodied in the concept of industrial ecological parks, became evident.

4.2.1 An Overview of Ecological Industrial Parks

The first to come out with the concept of the eco-industrial park is the ending development institution which was exposed to the concept in late 1992. In 1990, innovators at the University of Delhauze and Cornell University developed a practical framework for the development and development of the concept of an industrial park. It should be noted that the idea of eco-industrial parks was described for the first time through a lecture at the United Nations Conference on Environmental Development, Rio de Janeiro in 1992, which led to the presentation of this concept to the staff of the United States Environmental Protection Agency in 1993, The Agency subsequently adopted the concept of EIP as a technological environmental initiative and recommended that the Sustainable Development Council adopt its principle that reflects the links between organisms in the natural ecosystem in 1995. Since 1994, the collaboration with the Research Council of the US EPA has focused on the EIP concept, Time The short term duration of significant changes in environmental management and site development was the right to move through significant government agencies through their first industrial projects.

In early 2001 there were at least 40 industrial eco-parks in the United States where economic and industrial development projects were initiated, some advocated industrial ecosystems, or product exchange systems where innovators built 60 industrial ecological parks as projects spread across Asia, Europe, South America, Australia, South Africa, Namibia, Japan. This rapid deployment of industrial ecological parks as a new concept in planning and signing shows that it has pointed to a strong appeal to the interests of both the public and private sectors for sustainable development.

4.2.2 Definition of Industrial Ecological Parks

The definitions that have been given to the concept of ecological industrial parks have been varied, the most important of which are as follows:
- Definition of the Commission on Sustainable Development in 1996, where ecological industrial parks have been defined as an industrial system for the planned exchange of materials and energy that requires the reduction of energy and raw materials and their uses, waste reduction and the building of sustainable social, ecological and economic relationships.
- A community of manufacturing and service industries aimed at improving environmental and economic performance through cooperation among them in resource management, social, environmental and economic affairs, and in the management of environmental issues and resources by working with each other, the business community requires combined benefits that are larger than the single benefits For each industrial unit separately.
- A network of factories and industrial units working together to develop their environmental performance based on the term industrial ecosystem to describe the equal and developed relations between them.
As a result of the above, industrial ecological parks can be defined as "a community of manufacturing and service industries, a sustainable design strategy for the implementation of the concept of industrial ecology, aimed at developing the economic performance of companies with environmental impact activation, pollution prevention and energy efficiency".

4.2.3 Types of Ecological Industrial Parks

We distinguish four major categories of ecological industrial parks:
1. Garden-based exchange products: is a group of companies and factories that seek to benefit from each other (products, energy, water and resources) instead of disposing of them as waste.
2. Eco-industrial network: a group of factories and collaborating companies to improve environmental, social and economic performance.
3. Virtual Eco-Industrial Parks: A group of factories or companies that are scientifically linked to one another and can participate in recyclable raw materials and reduce environmental pollution.
4. Zero-industrial industrial parks Emission of pollutants: In which the emission of pollutants is zero or zero and may be called the closed loop of manufacturing, designed in the best way and its goal of reducing the polluting emissions of waste, depends on the collective work between factories and companies to reduce pollution of the combined work.

4.3 The Role of Industrial Parks in Promoting Quality of Life

Industrial parks play a major role in enhancing the quality of life, directly or indirectly, through its impact on many environmental, social and economic aspects, which are highlighted as follows:

4.3.1. The Role of Industrial Parks in Terms of the Environment

The environment can greatly benefit from the development of ecological industrial parks, and the most positive effects on the environment, we reduce emissions in the atmosphere, reduce energy consumption and water, and reduce the discharge of sewage, This difference is mainly due to the industrial structure of industrial parks, such as enterprise formation, sector, size and level of technology and management.

Environmental benefits from industrial parks that contribute to enhancing the quality of life in industrial regions include:
- Reduce air and soil pollution and reduce solid and hazardous waste
- reducing the volume of wastewater and groundwater and surface pollution;
- reducing carbon dioxide emissions and some other greenhouse gases and thereby reducing climate change;
- conservation and protection of biological diversity;
- reduction of product losses;
- Reduce energy use by achieving energy efficiency and energy recovery;
- Establishment of green spaces in and around the industrial area;
- Waste recycling and recycling;
- reducing the space required for storage of waste;
- Disaster risk reduction.

Industrial pollution is an urgent necessity to enhance the quality of life, particularly from the health aspect. Industrial pollution affects health through the spread of diseases and epidemics affecting human health and the surrounding environment. The society is affected by various types of pollution (air, water, dirt). This is reflected in human health.

4.3.2 The Role of Industrial Parks Socially

Although it is not often planned when establishing industrial ecological parks, the establishment of these parks often involves the establishment of a more important social infrastructure. Social infrastructure activities consist of facilities and services including schools, Clinics, hospitals and pharmacies, training young people and women on broader community services, and some companies become socially beneficial as part of a deliberate corporate social responsibility strategy.

The social structure provided by ecological industrial parks includes:
- Environmental Education;
- occupational health and safety of residential units;
- School facilities and kindergartens;
- Awareness and vocational training;
- Establishment of projects for poor people.

4.3.3 The role of Industrial Parks in Economic Terms

The main economic benefit of creating direct or indirect jobs, reducing costs due to waste reduction, resource and energy consumption, increases competitiveness, and many eco-industrial parks attract a large volume of FDI.

In terms of absolute value, the size of the economic benefits varies greatly depending on the size of the industrial park, with the increasing benefits of increasing the size of the industrial park.

Indirect benefits are difficult to verify but are very important for long-term economic development, including the creation of indirect employment through improved skills and training, technology transfer, regional development and good governance practices.

The most important gains from the establishment of industrial parks, which are reflected in the quality of life, are:
- creating direct employment, generating income and increasing per capita income;
- Attract foreign direct investment;
- avoid regulatory fines due to fees and waste;
- export growth and diversification and the strengthening of government revenues;
- Increase the competitiveness of companies and increase sales through green marketing and with enhancing the mental image of companies to the consumer;
- low waste management costs;
- Reducing the costs of energy, water, transport and various resources used in production;
- improving the business climate;
- Integration with regional, national and international markets.

5 Comparative Studies

5.1 Experience of Denmark and Vietnam in Ecological Industrial Parks and their Contribution to Enhancing the Quality of Life

The theme of eco-industrial parks is one of the most recent topics in its concept and design thought, as well as its spread in industrialized countries as an alternative to polluted industrial zones, which have implications for the social, economic and environmental environment. Denmark's industrial parks are one of the most important international experiences in this area.

5.1.1 The Danish Experience in the Field of Industrial Ecological Parks - the Experience of the Industrial Zone Kalondborg-

The ecological industrial zone of Kalondborg is a symbol of industrial ecology and a model of environmental sustainability, because it is considered to be the oldest and, on the other hand, an ongoing network of interdependence. This symbiosis comprises five companies that are separated from one another by different meters, Network of pipes The project has attracted a great deal of international attention.

-Definition of the Kalondborg Industrial Zone:
Kalundborg is a city of about 50,000 inhabitants, located 100 km west of Copenhagen, on the North Sea coast. This city is a relatively deep and ice-free port throughout the year, allowing it to accommodate cargo carriers, The city has a network of private and public companies connected to more than twenty contracts for the purchase and sale of by-products from industrial production. The remaining products of water, steam, ash, gas and

clay are exchanged from one industry to another in a closed loop MOS in the framework of the so-called industrial solidarity.

-Main Parties of Industrial Self-Sufficiency:

Caloundborg: Industrial Self-Sufficiency is based on cooperation between five industrial establishments and the city of Caloundborg (Figure 1). The region includes:

-Asnaes power plant: Denmark's largest power plant consumes 1,500 MW of carbon.

-BPB gyproc: annually produces 14 million square meters of gypsum board, almost the amount needed to build all homes in six cities the size of Caloundborg.

Novo nordisk is a leading biotechnological company with more than 2 billion annual sales. It consists of two entities (Novo Nordisk and Novozyme) where insulin is made by genetic engineering (40% of the global supply of insulin), as well as the production of industrial enzymes, Employs more than 2,000 people, the largest party in the group, and this company operates in many countries, but the branch of Klondburg, is the company's largest production site.

Statoil oil refinery: the largest in Denmark, with a capacity of 5 million tons per year.

Biotekniskjordrens: It specializes in dust treatment

Municipality of Caloundborg: controls the distribution of water, electricity and central heating in the area of the municipality of Klondburg

-The main characteristics of the ecological industrial zone Kalondburg:

Industrial Zone Kalondborg features many characteristics are as follows:

- Different industries involved in Self-Sufficiency.
- The short distance between the parties involved in the eco-industrial zone, which is very useful in the transport economy, as well as convergence of views in terms of objectives and directions.
- Agreements between participating parties are based on a commercial basis; exchanges between partners can take several forms: barter, sale, etc.;
- Formulation of solidarity is voluntary but occurs in close collaboration with government authorities, since exchanges between partners have received no financial support.

-Major tradeoffs and mechanism of occurrence at the level of the ecological industrial zone Kalondborg: At the industrial zone level, many materials and energy are exchanged as follows:

-Waste: This is done as follows:

- There are a lot of blocks flowing from the company novo nordisk and is mainly in the dead yeast (about 200 thousand tons per day), which are organic chemicals produced by the processes of the insulin industry, these blocks turned to Novogro is a liquid fertilizer chemical plant for the field of agriculture, Which is provided free of charge to farmers in the region through 70 km of pipelines to distribute the product to more than 800 farms, and this avoids the company costs of disposal by adopting this method.

Waste from municipal wastewater treatment plants is used by a biotechnology company and allowed for reuse in different applications (construction, agriculture).

- Dust from the electrical station

The electrical station is re-valued in cement (cement factories) while the sulfur produced by the oil refinery is reused in the form of sulfuric acid for the manufacture of fertilizers.

- Waste from the industrial zone is burned for heating in the city, or converted to gases for the production of electricity by the terminal of asnaes.

-Energy materials:

- The excess heat produced by the combustion power plant is reused in many uses, such as heating in homes and in aquaculture (fish farming).
- Water vapor generated by the power plant used by the Petroleum Refining Company, which covers 15 percent of its needs to heat its tanks and pipes, and the plant novo nordisk used to heat and sterilize its industrial processes.

- Gases:

Gases produced by the refining company are used by the power plant and by the gypsum plant. In both cases, the gas is offered at a very competitive price for both, because it is considered waste for the refining company on the one hand and a source of revenues for the other.

-Water:

The hot water produced from the product by the electrical station is converted into a tank to be cooled by the desire of the petroleum refining company. If the latter needs cold water or lukewarm to cool its machines, it only has pressure on the tanks. Oil is re-distributing its used water to the power plant it processes before it is used for electricity production, and novo nordisk re-processes its water before sending it to the city's filter station and is usually easy to process because it is hot.

-Gypsum

Gypsum used by Gyproc is imported from Spain, where it is extracted from natural quarries and transported by ship on nearly 2,000 kilometers, with all the financial costs and environmental implications of this process. However, with the use of the industrial Self-Sufficiency mechanism, Gyproc company using gypsum as a result of cleaning the high chimneys of the power plant to manufacture gypsum walls ready made natural gypsum imported from Spain and prevents the exit gypsum chimneys to the natural environment, so this process provides a lot economically, which prompted the company to develop Mlah produced to allow the use of more recycled gypsum extracted.

-Sulfur:

Statoil produces sulfur from flue gas, which is distributed to fertilizer manufacturers, where sulphide enters into the formation of the latter.
The following figure illustrates the various exchanges between partners in the Kalondborg industrial zone

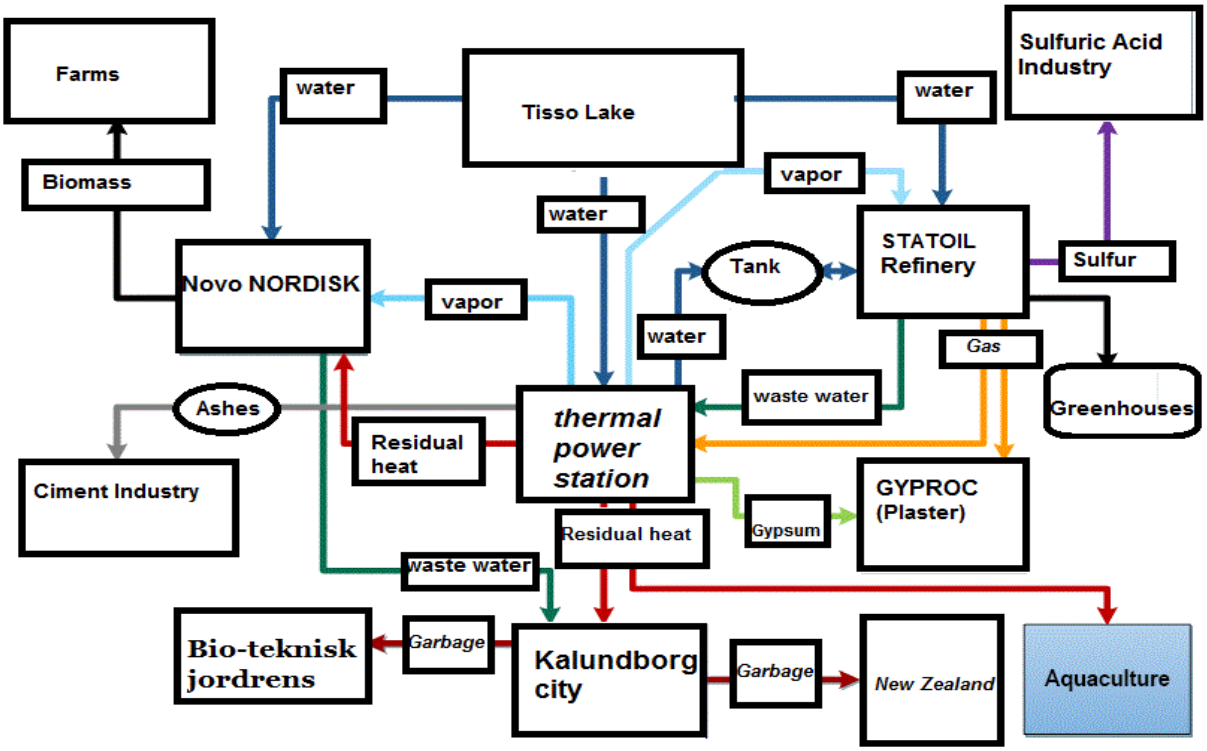

Figure1: Industrial Self Sufficiency Mechanism in the Ecological Industrial Zone of Kollendborg.
Source: Marc Albert Et Autres, Ecologie Industrielle et Kalundborg, Université De Technologie De Compagnie, 2012, P8

It should be noted that industrial interdependence in the eco-industrial zone Kalondborg depends heavily on trust between partners, and exchanges are based on secret commercial contracts.

5.1.2 Economic and Environmental Results of the Industrial Zone

The Kalondburg Industrial Park achieved many results, as follows:
- Environmental Results:
Industrial Self-Sufficiency operations have contributed significantly to the reduction of waste and the resource economy of Londborg, which is highlighted in the following table:

Table 1: Environmental Results of the Self-Sufficient Industry.

Recycling of waste (per Annum)		Reducing emissions (per Annum)		Reducing Consumption (per Annum)	
65000 tons	Fly ash	130000 tons	Co2	30000 tons	Petroleum
4500 tons	sulfur	380 tons	So2	1300 tons	nitrogen
280000 m3	liquid biomass	2800 tons	H2S	1200000 m3	water

97000 m3	solid biomass			550 tons	phosphorus
				170000 tons	gypsum

Source: cyril adoue, l'écologie industrielle, 1er Edition, presses polytechniques et universitaires, romandes, 2007, p30

Table (1) shows that Self-Sufficiency operations have allowed for a significant reduction in resource consumption, which contributes to the preservation of local resource reserves and thus preserves the right of future generations of resources. The table highlights the importance of the water economy by 3 million cubic meters Which is essential for the region of Kalondborg characterized by scarcity of fresh water. The table also highlights the economic importance of gypsum, which has helped Self-Sufficiency to reduce its imports from abroad, thus reducing the negative external impacts on economic activity. Self-Sufficiency has also contributed significantly to reducing emissions and waste which are once again included in the production process as by-products of other industries, thus contributing to the preservation of environmental and human health in general.

-Economic Results:

The Eco-Industrial Park has achieved many economic benefits for its members. However, since all agreements between companies are of a commercial nature (hence confidential), it is difficult to obtain accurate figures. In general, this interdependence has some economic consequences:

a. Total investments: $ 60 million
B. Annual Returns: $ 10 million
C. Accumulated revenues: $ 120 million
D. Average time of consumption: less than 5 years

5.2 The Vietnamese Experience in the Field of Industrial Ecological Gardens - the Experience of the Industrial Zone (Kinh Mon)

The experience of Vietnam in the field of industrial ecological gardens is an emerging experience and was the result of industrial development, which was accompanied by a number of obstacles which pollution and environmental issues at the forefront.

5.2.1 Industrial areas in Vietnam and pollution problems:

Over the past 10 years, Vietnam has witnessed rapid economic growth driven mainly by processing and manufacturing sectors. To facilitate the establishment of new industries, the government has established industrial zones (IZs), which now account for 38% of GDP Vietnam has 321 industrial zones, comprising 6,600 FDI projects and around 6,200 domestic investment projects with a community capital of more than $ 105 billion, 693 Billion billion Feith Nami (31 billion dollars).
The following figure shows the development of the number of industrial areas in Vietnam

Table 2: Evolution of the number and size of industrial areas in Vietnam.

2015	2010	2005	2000	1995	1991	Year

300	**250**	**131**	**65**	**12**	**1**	Number of industrial zones
84450	**71394**	**26986**	**11964**	**2360**	**300**	Size of industrial areas (ha)

Source: Tran duy dong, eco- industrial park in Vietnam, united nations industrial development organization, ulsan, 29 june 2016, p: 2.

The figure shows that industrial areas in Vietnam witnessed rapid growth. The number of industrial zones increased from 12 in 1995 to 131 in 2005, doubling the number to more than 300 in 2015.

This growth in the industrial zones is accompanied by negative effects. Industrial activities also have negative effects on the environment and on human health. The inefficient management of resources increased greenhouse gas (GHG) emissions and caused pollution of water and soil. Where 20 percent of industrial waste is hazardous, and 70 percent of industrial wastewater is untreated. Despite the efforts of the Vietnamese government, many barriers to industrial pollution in the country have yet to be overcome.

2.2 Industrial ecological parks in Vietnam: The project for the establishment of ecological industrial parks in Vietnam was supported by the GEF, the Swiss Secretariat for Economic Affairs (SECO) and the United Nations Industrial Development Organization (UNIDO). The main partners are the Ministry of Planning and Investment of Vietnam, the relevant ministries and local authorities Ninh Binh-Da nang can tho, which lasts for three years.

The project aims to transform the existing industrial zones into environmental industrial parks, through which companies cooperate with each other and with civil society to reduce environmental impacts and Economic costs In addition, clean carbon technologies within industries will be introduced to reduce greenhouse gas emissions, reduce organic pollutants and pollute water, and the following table illustrates the evolution of the number of industrial areas in Vietnam.

Table 3: Eco-Industrial Parks in Phithnam.

No of Companies Registered	**Province**	**Industrial Area**
38	Ninh binh	Khanhphu
205	Da nang	Hoakhanh
101	Can tho	Tra noc 1
46	Can tho	Tra noc 2

Source: Tranduy dong, eco- industrial park in Vietnam, united nations industrial development organization, ulsan, 29 June 2016, p4.

The experience of the ecological parks in Vietnam has been very good, despite its novelty, and this is demonstrated by the results achieved, which are as follows:

- Reduction of water consumption by 25.000 m3 per year, 4.028.3 tons of carbon dioxide per year, 5.883.700 kW of electricity is saved annually, saving 10.2 billion Ding.

5.2.2 Industrial Ecological Park (Kinh Mon) Vietnam

The Kinh Mon Industrial Park is one of the most prominent Vietnamese experiences in the field of industrial ecological gardens, reflecting the direction of Vietnam towards industrial ecology as an approach to industrial development.

Kinh Moon is located in Hai Duong County, a province in the Red River delta in North Vietnam with a total area of 112.9 km2.

In the past, agricultural production has dominated the economic structure of Ken Moon; however, in recent years the region has seen significant industrial development and many harsh environmental impacts, and sustainable development has thus become the goal that this region wishes to achieve. Building eco-industrial parks in this area is one of the measures to help achieve these goals.

5.2.3 Industrial Park and Exchange Mechanisms

The Kinh Moon Industrial Park is comprised of several major parties, including:
-Hai Duong Thermal Power Plant:
The thermal station of Phuc Thanh Municipality, Kinh Mon District, Hai Duong Province, is 600 * 2 MW. The plant is made up of two units. The input of this plant to fuel from coal extracted from nearby mines is 4.239.300 Tonne annually, in addition to gypsum stone about 234,000 tons per year. This is in addition to the water where the plant is used about 480 m3 / s. The output of this plant is in ash and coal burning residues of 1.899.560 tons per year. In the removal of sulfur in coal, excess heat where the plant is used only 38.15% in generating electricity and the wastewater output is 4001 m3 / h and contains acid, alkaline and solid contaminants.

-Raw materials factory (raw brick):
The factory products are bricks and roof tiles, usually used for construction, they are made of different materials through different techniques, raw materials used in production include cement, sand, gravel, coal residue, compared with traditional advantages such as saving resources, avoid coal so as not to pollute the air.

-Kinh Mon wrapping plant:
The packaging plant is located in Phuc Thanh Municipality, Kinh Mon County, Hai Duong Province, with a production capacity of 15,000 tons per year. The factory input is in recyclable paper: 34,500 tons per year, pine resin (glue): 6 Kg / ton, starch: 0.1-0.2 kg / ton, aluminum sulphate: 34 kg / ton. As for energy, the plant needs about 2178000 kW / year, 72,600 kW / day of electricity, used for production and lighting. Thermal, while excessive heat is reused from the thermal power plant to dry the paper, as for the water Visit The factory has about 10.000 m3 daily.

The output of the factory is in packaging paper: 15,000 tons per year, and the packaging is supplied to the Hoang Thachcement factory and others in this area, cooling water for machinery and washing: 30,000 m 3 per day transferred to thermal power plants, plastic and waste: 1 kg / Ton.

-Fly ash and coal residue processing plant:

Fly ash and coal combustion residue from the thermal plant as soon as recycled and reused will yield many economic and environmental benefits such as waste minimization and land savings for waste disposal.

The coal ash and coal residue treatment plant in Phuc Thanh municipality, Kinh Mon County, Hai Duong province, has a capacity of about 2,000,000 tons of coal and ash burning residues per year. The plant's inputs are fly ash, coal combustion residues from the thermal plant and a cement plant.

After the treatment of these inputs according to advanced technology, the output of this plant will be high quality materials used by others, fly ash is used by the cement factory Huang Thatch, and the residue of coal combustion is used by the raw brick factory, the figure shows the parties and mechanism of exchange between Garden edges Kinh Mon.

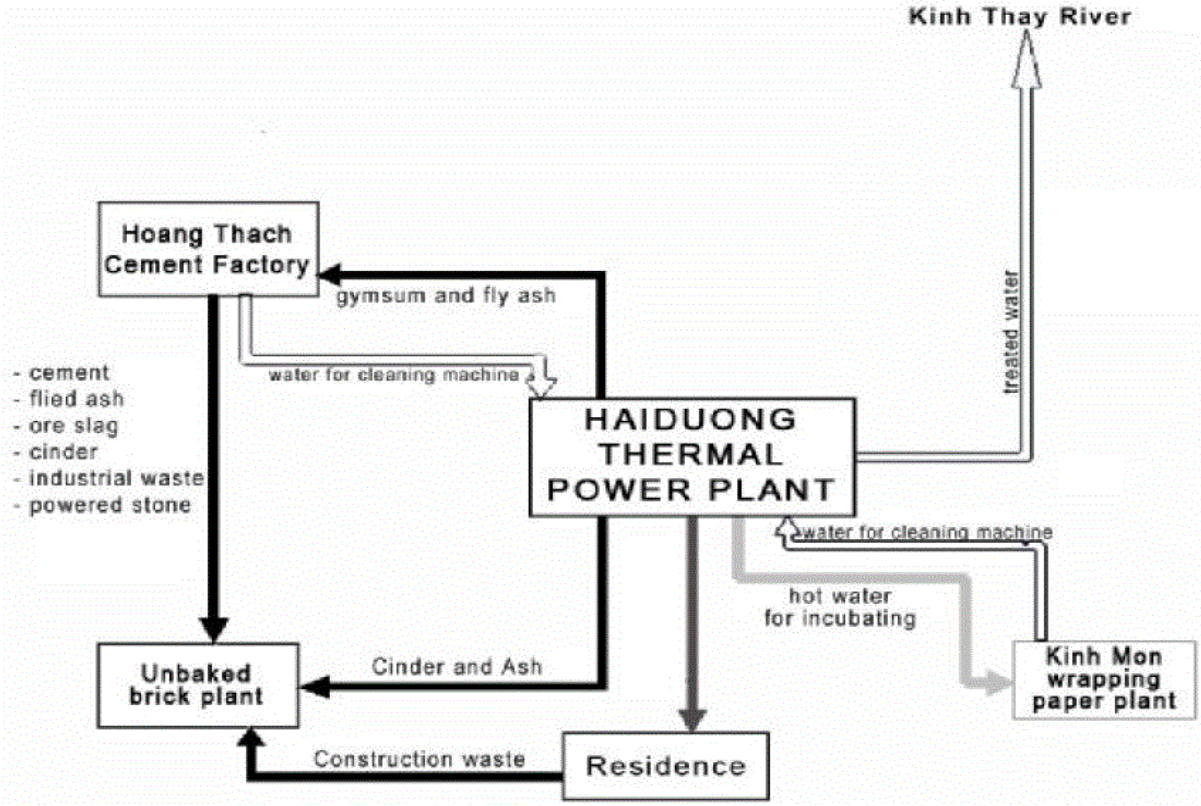

Figure 2: Mechanisms of exchange between the parties of Hai Duong Industrial Park. *Reference: Lienand (2011)*

5.2.4 Economic, Social and Environmental Benefits of Hai Duong Ecological Industrial Park

For member companies, the exchange of garden members can not only reduce costs by providing materials and energy, sharing the cost of any services, waste management, staff training, supply systems and environmental information, but also increase production efficiency through the exchange mechanism Secondary products. In particular, the process

of manufacturing cement requires gypsum as an additive about 2 million tons annually, and because natural gypsum is not available, the supply of this material depends entirely on the source of imports. Meanwhile, the SO2 processing process at the Hai Dung power plant produces synthetic gypsum that can be used in the Huang Thatch cement plant.

This exchange is a good idea to solve economic and environmental issues: it can not only reduce the added cost but also reduce pollution and demand for resources. In addition, their development could create jobs for the economically inactive population, develop the local economy and support the development of small local industries and traditional handicrafts. These parks can also reduce pollution sources in the environment, waste and resource demand through cleaner production, reuse and recycling.

6 Conclusions

Through this study it is clear that the industrial ecological gardens have a significant impact on the quality of life, and this is based on their impact on the environmental and health aspects of the members of the industrial society. The following are the main findings:
- The dependence on the end-of-pipe approach in the industrial system has led to many global environmental and economic problems such as global warming and panic in the raw materials markets, which have led to a deterioration in the quality of life from an environmental perspective.
- Industrial ecology is considered as a tool for implementing sustainable development, moving from a linear industrial system to an industrial ecosystem by integrating limited resources and the need to limit the impact of human activities on the natural environment.
- Industrial ecology is applied in industrial areas through Self-Sufficiency, which produces a range of economic and environmental benefits and benefits for the participating parties and the economy as a whole.
- Although the idea of industrial parks started randomly with a view to the economy of raw materials and reuse of waste, the project has now been developed at a high level of environmental awareness. It has achieved many environmental and economic gains and has become a symbol of industrial ecology.

Finally, it can be said that industrial ecology has resulted in the industrial system of negative ideas towards the environment and the exploitative relationship between them, thus providing conciliatory solutions between industry and environmental issues, thus contributing seriously to improving the quality of life.

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