

**VISION AND SATISFACTION IN POLLUTION PREVENTION
TOWARD THE ECONOMIC MEASURES AMONG
THE INDUSTRIAL ENTREPRENEURS IN
INDUSTRIAL ESTATE OF THAILAND**



KAMOLCHANOK WEERANAVIN

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was submitted to the Faculty of Graduate Studies, Mahidol University
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VISION AND SATISFACTION IN POLLUTION PREVENTION TOWARD THE ECONOMIC MEASURES AMONG THE INDUSTRIAL ENTREPRENEURS IN INDUSTRIAL ESTATE OF THAILAND

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ABSTRACT

The objective of this research was to study vision of industrial entrepreneurs in environmental pollution prevention and their level of satisfaction with economic measures in industrial estates of Thailand, factors related to the vision in environmental pollution prevention and factors related to satisfaction with economic measures. The researcher used 287 questionnaires as the research instrument. After that, the researcher processed the data to find percentage and mean. The researcher analysed the relationship between independent variables and dependent variables with stepwise Multiple Regression Analysis.

It was found that vision among the entrepreneurs in environmental pollution prevention was at a high level. The researcher found that the independent variables related to vision in environmental pollution prevention were satisfaction with economic measures in pollution prevention in industrial plants and time period of business conduct of the industry plant. It was found that satisfaction of entrepreneurs with economic measures was at a medium level. The independent variables which had a relationship to the satisfaction of entrepreneurs with economic measures were vision of entrepreneurs in environmental pollution prevention and knowledge and understanding of entrepreneurs on economic measures.

As for recommendations for further research, there should be a feasibility study on incentivization for entrepreneurs to accept economic measures and another study done in which the sample group are not entrepreneurs in industrial estates.

KEY WORDS: VISION / SATISFACTION / ECONOMIC MEASURES

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วิสัยทัศน์และความพึงพอใจในการป้องกันมลพิษโดยใช้มาตรการทางเศรษฐศาสตร์ของผู้ประกอบการ
โรงงานอุตสาหกรรมในนิคมอุตสาหกรรมของประเทศไทย (VISION AND SATISFACTION IN
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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาวิสัยทัศน์ในการป้องกันมลพิษและความพึงพอใจต่อมาตรการทางเศรษฐศาสตร์ในการป้องกันมลพิษ รวมทั้งปัจจัยที่สัมพันธ์กับวิสัยทัศน์ในการป้องกันมลพิษและความพึงพอใจต่อมาตรการทางเศรษฐศาสตร์ในการป้องกันมลพิษ โดยเก็บข้อมูลจากผู้ประกอบการโรงงานอุตสาหกรรมที่อยู่ในนิคมอุตสาหกรรมด้วยการส่งแบบสอบถามทางไปรษณีย์จำนวน 335 คน และตอบกลับจำนวน 287 คน คิดเป็นร้อยละ 85.7 ของจำนวนกลุ่มตัวอย่างทั้งหมด แล้วนำข้อมูลที่ได้จากแบบสอบถามมาประมวลผลด้วยโปรแกรม SPSS เพื่อหาค่าร้อยละ ค่าเฉลี่ย การวิเคราะห์ความสัมพันธ์ระหว่างตัวแปรอิสระและตัวแปรตามด้วยการวิเคราะห์ถดถอย (Multiple Regression Analysis) โดยวิธีการกำหนดการเข้าออกของตัวแปรอิสระเป็นแบบขั้นตอน (Stepwise)

ผลการวิจัยพบว่า ผู้ประกอบการโรงงานอุตสาหกรรมในนิคมอุตสาหกรรมมีวิสัยทัศน์ในการป้องกันมลพิษอยู่ในระดับสูง สำหรับการศึกษาค่าความสัมพันธ์ที่มีความสัมพันธ์กับวิสัยทัศน์ในการป้องกันมลพิษ ได้แก่ ความพึงพอใจของผู้ประกอบการโรงงานอุตสาหกรรมต่อมาตรการทางเศรษฐศาสตร์ และระยะเวลาในการดำเนินการของโรงงานอุตสาหกรรม ส่วนผลวิจัยทางด้านความพึงพอใจในการป้องกันมลพิษโดยใช้มาตรการทางเศรษฐศาสตร์อยู่ในระดับปานกลาง สำหรับการศึกษาค่าความสัมพันธ์ที่มีความสัมพันธ์กับความพึงพอใจในการป้องกันมลพิษโดยใช้มาตรการทางเศรษฐศาสตร์ ได้แก่ วิสัยทัศน์ของผู้ประกอบการในการป้องกันมลพิษจากโรงงานอุตสาหกรรม และความรู้ความเข้าใจของผู้ประกอบการต่อมาตรการทางเศรษฐศาสตร์

การวิจัยครั้งนี้มีข้อเสนอแนะคือ ควรศึกษาความเป็นไปได้ในการให้สิ่งจูงใจแก่ผู้ประกอบการหันมาสนใจยอมรับมาตรการทางเศรษฐศาสตร์ และศึกษากลุ่มตัวอย่างที่ไม่ใช่ผู้ประกอบการโรงงานอุตสาหกรรมในนิคมอุตสาหกรรม

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CHAPTER 1

INTRODUCTION

1.1 Background and Significance of the Problems

From the progress of economics and technology, there has been the use of various resources extravagantly. There has been a misconception that resources are abundant and they are limitless. Nevertheless, today, people acknowledge that in fact resources are limitless. Should there be the uncaredful use of resources as it has so been, in the future, the environment will get deteriorated. There will be more and more noxious materials all over. The old concept of economy, which stated that there must be a maximization of the profit at minimum cost, has caused an abundant use of resources without attention for environment prevention. One can see this from the way industrial plants have emitted their waste from the production line ie. waste water, waste air, to environment. This has been done with no control for dirtiness. The impact is on deteriorated environment on a consecutive basis. The cause is from the maximized cost reduction up to the point that people lack their responsibility for waste emission to the environment (Narong Maneeyarak, 1995: 2-2).

At present, pollution problem has impacted people's health directly and indirectly. Thus, the issue has been important and has gained public interest on a wide scope. This is especially true in the private sector for serious cooperation for problem solution. The private sector has employed this issue as their selling point of the goods for pollution reduction. Meanwhile, the public sector has stated clearly that "there is an urgent need to protect and to solve the problem of water pollution, air-noise-hazardous waste-solid waste pollution, with the principle that those who cause the pollution is the ones who pay for it" (Pollution Control Department, 1995: 74). By this principle, in terms of economy, it is considered as fair. As well, by the principle of environmental management as per international economic discipline, the one who

causes pollution is the one who pays. Many countries, especially OECD, has employed this principle seriously since year 1972. In fact, each country has designed the pattern-the procedure- and the process which suits local needs (Churai Tappawong, 1992: 542).

In preventing environmental quality, the payment for control and prevention is in fact the solution for the problem on a fundamental basis. It is true that once environmental problem has taken place, regardless of there is the compensation or not, it can not be compared with the lost environment which has been deteriorated. Though one possesses money, time must be consumed in order to get back the quality environment or it might not be able to get them back (Churai Tappawong, 1992: 543).

For the past environmental management, the government has employed the measures on direct control. This is in line with the principle of who causes the pollution is the one who pays for. However, the practice, there has been more burdens on the government while the quality of environment is not getting any better. Therefore, direct measures for control seems not to be efficient as for the following reasons (Environmental Research Institute, 1998: 4).

1. On the part of the government: the control for the entrepreneurs to treat the pollution as per the set standard for effluent/emission. The government itself has no exact information on the treatment for pollution by each type of industry. This, in turn, has caused the entrepreneurs to employ the principle of BACT or Best Available Control Technology in order to treat the pollution as per the designated standard required by laws. The more the strict penalty is, the more the violent party would deem the avoidance as not worthy. In such case, the one who causes the pollution might avoid if possible.

2. On the part of entrepreneurs themselves, they do not consider this method as pollution reduction at minimum cost. It is also not the way to solve the problem at the start, but at the end. The more the regulations, the less the control on production cost. There is also a lack of marketing incentives which the entrepreneurs need to be responsible for the pollution caused by them.

Pollution management by industrial plants consists of procedures both for management and planning, as well as for technical management, all of which will get rid of polluted materials impacting on the environment. Ecology system can prevent and can get rid of the emitted surplus. Therefore, there has been marketing mechanisms to support the desired behaviors ie. price incentives, etc. Decision-making depends on each individual with their awareness on environmental problem. There is also an advantage on the commerce and profit from this. In pollution management, one has employed the system of management for environmental standard. Thus, there has been the Green Business which has been a result from alertness on environment. On a global basis, private sectors can increase their profits from their green products, which are the products which does not impact the environment or impact on a lesser basis. This covers the used materials, production process, and pollution control. These goods can make the profits with price competitive with other kinds of goods. It is however the way to create business image and to preserve the environment.

The standard of environmental economy is another way to reduce pollution amount which has been caused by industries, communities, and others. The employment of economic tools on environmental management has pushed the burden on finance to the one who causes the pollution. In some cases, it is expanded to financial incentives for the one who causes the pollution in improving environment ie. subsidy for investment in moving the industrial plants from the sources of most pollution or subsidy for investment in pollution treatment system. These economic tool has been believed to decide for the policy in terms of flexible environment with efficiency. It is also believed that these tools will create an improvement, environment, and efficient treatment method (Narong Maneerak, 1995: 2-4).

In the concept of bringing in the measures of economy into the management of pollution in the environment, there has been other methods which are influenced by the concept of “sustainable development” which is the need of people who adjust the thinking method, lifestyle pattern, and production method. They are the ones which do not lead to environmental destruction or the least destruction possible. The

economic tool under use are (Pakpimon Pienlumlert, 1997 quoted in Oranut Ritchitpien, 1998: 19-20):

1. **Charges:** or fees collected from the one who uses the service to get rid of pollution. These fees must not be high as it can be an obstacle for investment or can be a loss of competitive advantage. However, it must not be so low that the entrepreneurs are willing to pay for the fees more than to try to find the way to reduce pollution by themselves. These are Effluent Charge, Emission Charge, User Charge, and Product Charge.

2. **Subsidy:** this is the way the government has to support the industrial plants to change the technology used for the production in order to reduce pollution problem or to adjust the behavior of consumers to use the goods which do not destroy the environment.

3. **Deposit-Refund System:** this relies on the principle that the one who causes the pollution must be responsible for the payment of the fee and charge to the deposit/fund with advanced evaluation and the payment needs to be on time.

4. **Taxation:** this is the taxation for pollution as by nature, the one who causes the pollution is the one who gets it. The taxation will adjust consumers' behavior to select the goods which are not detrimental to the environment or the least environmental – affected possible.

5. **Market Creation:** this is a build-up of the licensed market where the one who causes the pollution can emit the treated pollution to the public as legally required. The key principle is that one has the right to apply for license in the initial stage. Those who apply later may or may not get the license, but they are permitted for pollution emission less than actual amount in need for emission. This method is a push for those licensed to emit the pollution less than require. One needs to find the way to reduce or to adjust new production process. The aim is for the emitted pollution to be in the same amount as licensed. One may find the method to ask for license from other licensed entrepreneurs who have less actual pollution. This will enable the high cost of the license and will be a push for the industrial plants to find the method of pollution reduction by themselves. This right purchase system is only available in the United States of America for emission trading only. In foreign

countries, there has been a promotion for the market to purchase goods which can be recycled with liability insurance.

Since the government has the policy to support industrial plants to be clustered, in order to facilitate the monitor of environmental problem, utility system management, factors on basic structure, as well as transportation, communication, and security system. Industrial estate is one of the mega project by the government which are ready for the investors to put in their money on factory set-up on a constant basis. The areas will be divided into export zone and general industry area. For the past several years, it has found out that industrial estates have created pollution as other factories ie. from news coverage.

Thus, there should be a study on the vision and satisfaction in pollution prevention by employing the measures of economy of the entrepreneurs in industrial estates in Thailand. This is in fact the method to solve pollution problem arised from production of industry. This has employed economic measures as an incentive for the private sector to reduce their waste from production line more than the focus for the industrial plants to reduce the amount of waste by treatment of by getting rid of them. Economic measures will be one more incentives for the entrepreneurs to be interested in and to be attentive to environmental quality. It is as well the solution for pollution problem caused by one own industrial plant. These measure are also mechanism for environmental on pollution prevention on a sustainable basis.

1.2 Research Objectives

1.2.1 To study the vision in pollution prevention and the satisfaction of entrepreneurs in industry to protect the pollution by the use of economic measures.

1.2.2 To study the factors relationship the vision in prevention of pollution and the satisfaction of entrepreneurs in industry to prevent the pollution by the use of economic measures.

1.3 Research Scopes

This study is the survey research with a focus on the vision and the satisfaction of entrepreneurs in industry to protect the pollution by the use of economic measure. The researcher will study the entrepreneurs in industrial estates nationwide in Thailand, for a total of 27 estates, they are:

- Northern region, 2 industrial estates
- Central region, 12 industrial estates
- Eastern region, 11 industrial estates
- Northeastern region, 1 industrial estate
- Southern region, 1 industrial estate

1.4 Research Hypothesis

1.4.1 Information on environment of industrial plants ie. time period of business conducted by industrial plants, complaints of the plants, etc., the industrial plants need to write up an analysis report on environmental impact, to provide officers in charge for monitoring management system for environment, and environmental management. These should have the relationship with an influence in the prediction of level of vision in pollution prevention and the satisfaction of entrepreneurs in industry for pollution prevention by economic measures.

1.4.2 Factors in environmental study: awareness on pollution problem from industrial plants, knowledge and understanding on environmental economic measures in pollution prevention, should have the relationship with in the prediction of level of vision in pollution prevention and the satisfaction of entrepreneurs in industry for pollution prevention by economic measures.

1.4.3 Economic measures: this is a good tool in controlling and protecting the pollution from the origin of pollution in industrial estates.

1.5 Operational Definitions

1.5.1 **Vision of the entrepreneurs in pollution prevention** means the attention by the entrepreneurs in industry in pollution prevention arising from production process of the industrial plant.

1.5.2 **Satisfaction towards the economic measure** means the feelings or attitudes towards the 5 economic measures. They are (1) pollution fee collection (2) state subsidy (3) fee payment and charge for the fund (4) pollution taxation (5) creation of market for license purchase in pollution emission. In positive term, it is a satisfaction, in negative term, it is non-satisfaction. They are divided into 3 levels, highly satisfied, satisfied, and low satisfied.

1.5.3 **Awareness for pollution problem** means the way one acknowledges, thinks about, or is aware of the importance of pollution problem arising from industrial production process.

1.5.4 **Understanding on the economic measure** means having knowledge and understanding on the application of 5 economic measures. They are (1) pollution fee collection (2) state subsidy (3) fee payment and charge for the fund (4) pollution taxation (5) creation of market for license purchase in pollution emission. In positive term, it is a satisfaction, in negative term, it is non-satisfaction. They are divided into 3 levels, highly satisfied, satisfied, and least satisfied.

1.5.5 **Pollution problem or environmental problem** means any actions arising from the steps or process of industrial production which impacts the environment as well as people health i.e. waste water, air pollution, waste residue, etc.

1.5.6 **Entrepreneurs in industry** means managers of industrial plants in industrial estates.

1.5.7 **Industrial estates** means industrial estates of Thailand which total in 27 estates nationwide.

1.6 Conceptual Framework

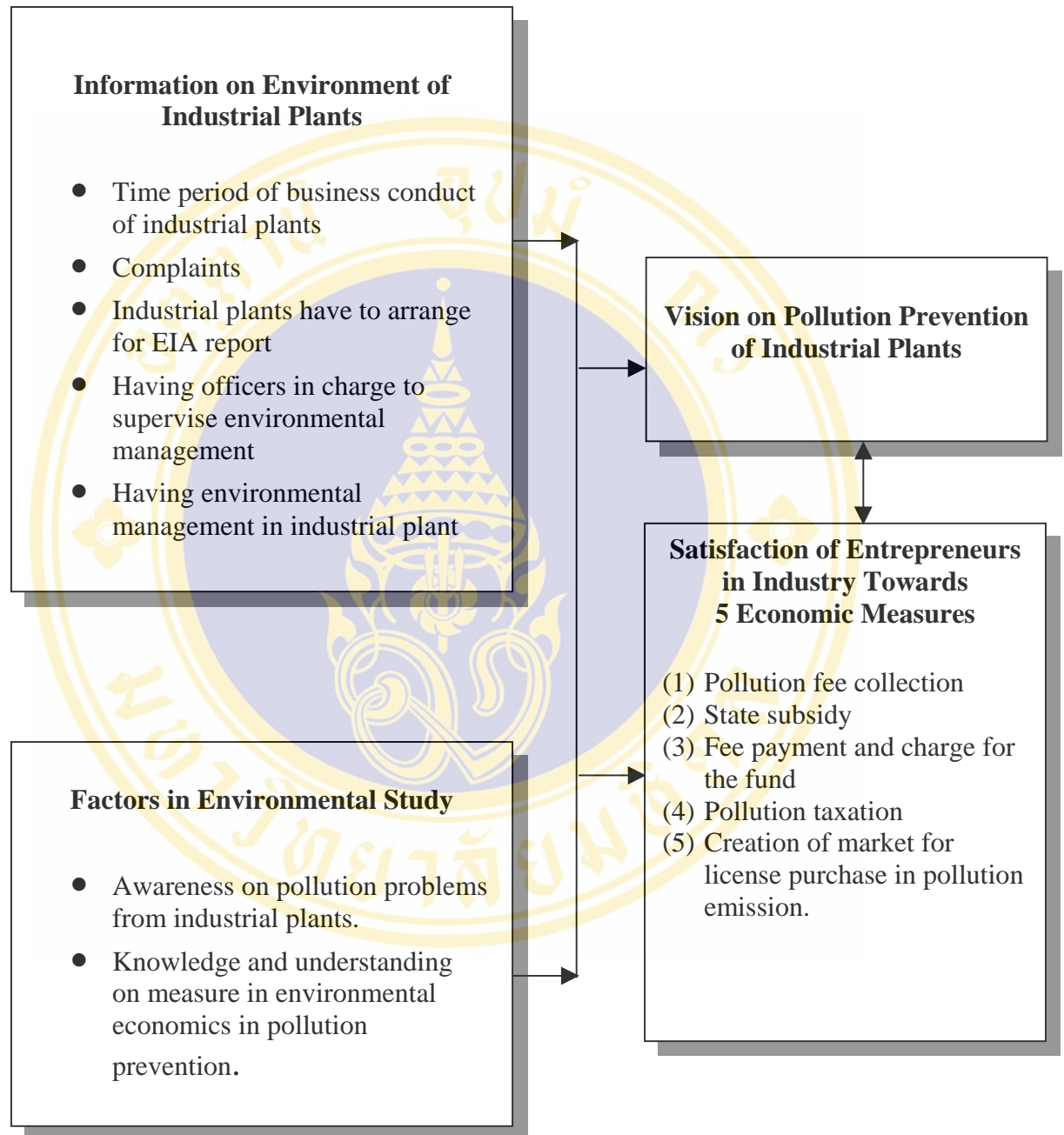
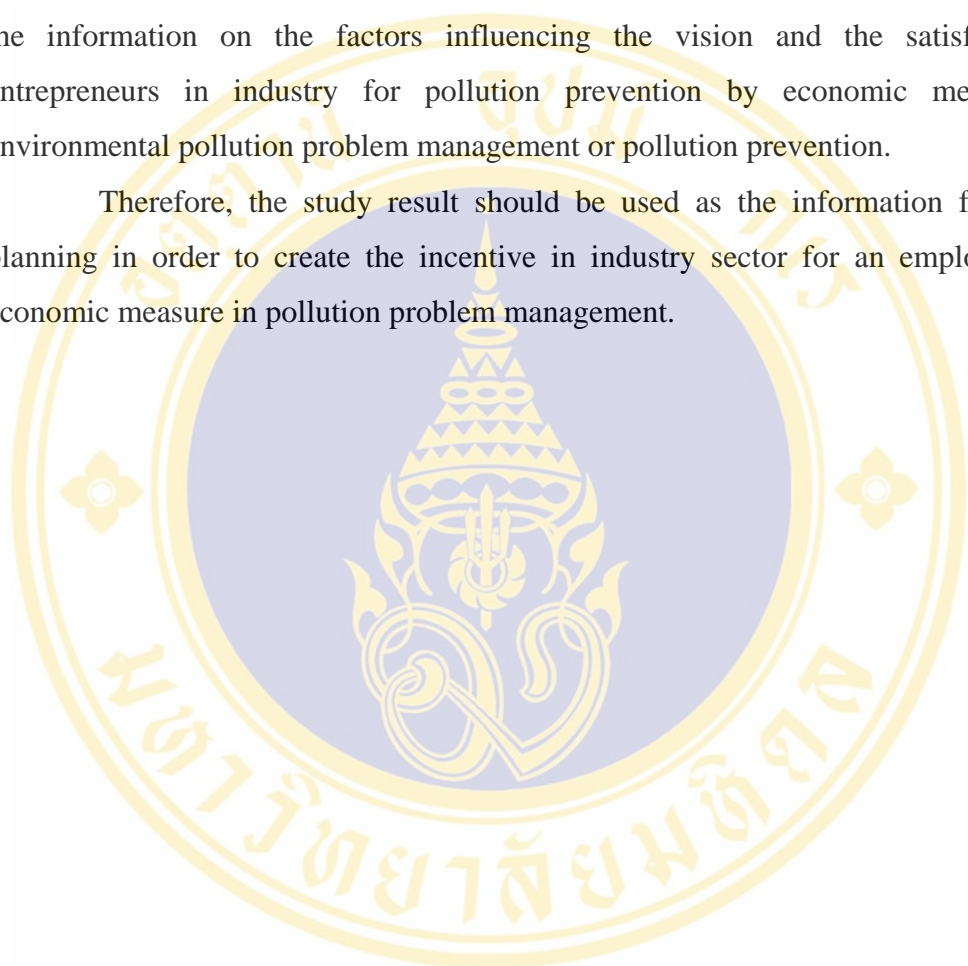


Figure 1 Conceptual framework on the vision and satisfaction in pollution prevention toward the economic measures among the industrial entrepreneurs in industrial estate of Thailand.

1.7 Research Benefits

This study can gain the information on vision and satisfaction of entrepreneurs in industry for pollution prevention by economic measures, as well as the information on the factors influencing the vision and the satisfaction of entrepreneurs in industry for pollution prevention by economic measures in environmental pollution problem management or pollution prevention.

Therefore, the study result should be used as the information for project planning in order to create the incentive in industry sector for an employment of economic measure in pollution problem management.



CHAPTER 2

LITERATURE REVIEW

In the study on “Vision and Satisfaction in Pollution Prevention Toward the Economic Measures Among the Industrial Entrepreneurs in Industrial Estate of Thailand”, there are a number of documents and relevant research papers as follows:

2.1 Concept on Vision

2.1.1 The Meaning of Vision

The meaning of vision as in Rachabunditsatan Dictionary (1987) has defined vision as follows:

- 1) Vision means perceiving or sight ability ie sight power, sight nerve organ eye-sight, far sight, imaginary power dream, sweet dream, see things in dream, sight-lure phenomena, sacred phenomena excellently beautiful figure
- 2) Vision means sight imagine, sight in dream ie. imagine things in appearance ie. imagine, see phenomenon in imagine, fortune-telling. Prediction

Vision as an official meaning means building up future picture or future view which becomes the future goal path. One will take in the planning system or what one wants to see happening in the future for bettering present situation. Vision can take place from knowing how to think with intellect. Vision might mean building up dreams but one has to be determined in every way to realize their dreams (Wantana Muangchan, 1999: 9).

Thongchai Santiwong (1996: 5) stated that “vision” is a popular term of the executives and general people who will see things afar for any impact or any possibility of the future world with high degree of change. It is something innovative as one has never seen from the past world. It is a mechanism to be used for one self-

adjustment and self-development to be in line with and to be over or to win the competitors under the new condition of global current.

Witayakorn Chiengoon (1996: 5) has translated the meaning of “vision” as “imaginary” by seeing it in picture. With a wider explanation, vision means to be able to see the future or to see the trend of the organization, society, or total environment.

Haruetai Putraseranee (1996: 21) stated that vision is the ability to create picture or imaginary in different things and things of better nature. More important, it is the ability to realize those thoughts into concrete staff/

Sittichai Tewateerarat (1997: 43) has defined “vision” as the determination of direction in long-term future. It has the feature of challenging the new progress in a widest term. It covers the most of the issue by providing better offers in a clearer manner which can be put into practice. It must be however reliable, flexible, and must not identify the path to achieve the goals. It must also be creative.

Sarot O-pitakcheewin (1997: 10) summarized that “vision” is event in the future or so called a future scenerio. It determines how an organization intends to be in the future. It is the clarification of the intended direction. It is a stimulus and the feeling of the organization’s members. It can be said that vision yields the picture of an organization of who we are, what we do, and where are we headed at.

Somkid Jatusripitak (1995: 33) stated that vision is the value. It is translated from English. Vision is the awareness of event or situation in the future. It is normally applied with strategic planning in terms of “having one’s vision”. It is one of the qualifications for the executives to perceive. The executives must be able to read the environment with an anticipation of the impact on the operation of the organization in the future with precision. The executives must be able to see factors being the elements of management and execution with efficiency. They have to see how to develop things for expansion in order to be in line with environment under changes.

Thieng Miedthaisong (1999: 21) summarized that vision means the qualification of an individual who can perceive the future of an organization which one wants in a clear manner. Such picture must be in line with the goal of the organization. It must be possible and one must be able to see the practice to achieve such need.

Chutamas Limpaboon (1999: 54) summarized the meaning of vision as the determination of goals of the organization in a long-term future. The members of the organization can then anticipate, create, and demonstrate.

From the meaning of vision quoted above, one can summarize that vision means the determination of direction in the future which is better than now. The goal has been set for an organization to proceed in the set direction.

2.1.2 Elements of Vision

Sittichai Tewateerarat (1997: 43) stated that elements of vision are:

1. Determination of direction in a long-term future

Vision has an importance in determining the direction in the future. This is done via selection process for the best to the unit, organization, up to the country. The person who best determines the vision must be the one with potentials and thinking energy on a high level. Otherwise, the determination of vision will become only a guess without the root of fact. However, vision commits to the result on a long-term basis amid changes. Vision is then the determination for future direction on a long-term basis. It starts from present to future result. Time commitment may range from 25-50 years or over depending on the situation. The longer the time commitment, the more the difficult for the chances on situation control. Thus, there is a need to periodical evaluation in order to confirm the correctness to be most near to the fact.

2. Features of challenges for new progress with widest coverage of issues

Vision is the gate to an innovation for what is not in current situation. It will however take place in the future. It is the link between “now” and “future”. It might not be seen on a superficial level, but one has to observe the change which

reveals as time passes. Therefore, to find out new solutions becomes a necessity and a challenge for innovation.

Vision has to cover the direction in 3 dimensions: time, place, and human beings, in order to produce changes which reply the question completely. Who do what in where and when for why and how are the key questions. Thus, vision has to be kept in a widest situation to cover most of the issues.

3. Vision must offer the better solution, in a clearer manner and in a practical way

Vision has to offer solution/alternative for a better one to the society as a whole. Offering alternative must be filtered via problem analysis, situation analysis, factor analysis, prior to situation assessment and better alternative offering. One needs to bring in rational approach and empirical approach in order to gain facts based on truth. After the 3 above stated analysis, one can then assess the situation in order to determine the vision.

4. Vision needs reliable qualification:

Clarification must be available, provable, with an identified sources of information. Vision is the outcome of production of thought in 2 mixed blend: critical thinking and creative thinking. They are the 2 key elements which keep the vision reliable. Meanwhile, flexibility must be equipped by not informing the path to achieve the final goal.

2.1.3 Building Up of Vision

Attakarn Satayapanich stated that vision is the index of intellectual ability of the leaders. It will be good or bad one depends on how to create. Nevertheless, skills in developing vision can be trained (1996: 27 quoted in Boonyoo Kohpornprasert, 1997: 24-25).

Nikom Chaturan (1996: 27) stated that good vision should comprise of stimulus and anticipation in a concrete term. There are 5 key steps of vision, they are:

First step: current situation analysis in order to build-up concepts the most possible. Take in all concepts and prioritize them. The information must be in figures

and thought current in a mixed blend. One should also employ the past data for consideration in order to find the proof.

Second step: create an individual's dream by taking in the representatives from each unit to present their future view with variety in order to cover all aspects regarding vision.

Third step: share and relate the dream by taking in all creativity of the representatives to be one single thought.

Fourth step: select the priorities which is the decision-making step for future of the organization or the unit in a collective manner.

Fifth step: get the vision straight in order to build up an inspiration and cover the content of the needed scope.

From the mixing of thoughts for drawing up vision, one can build up vision for execution and management which will impact the changes in a concrete term. One can then adjust and develop to achieve the goals. One can also promote the efficiency for the strength of an organization or the unit (Boonyoo Kohpornprasert, 1997: 25).

2.1.4 Importance of Vision

Vision is the implication of understanding for the past and the present. It is a roadmap to future goal. It is a manual for path direction as well. Thus, vision has an importance for the organization at present time. This is true especially for an organization being impacted from the globalization (Boonyoo Kohpornprasert, 1997: 25).

Amnuay Weerawan, former prime minister (Wantana Muangchan, 1999: 5) stated that “ key features for successful executives and leaders are visions. They will assist in anticipating and benefiting from the anticipation better than others. By viewing clearly the future, one can prepare for problem solution and prepare for procedure effectively. One needs not to be passive on problem-solving only. One needs to be inspired ie. dare to decide immediately, since changes comprises of risks. If one can anticipate in advance, risk will be minimized and the result will be good”.

Dumrong Boonyuen, the Director of Department of Medicine (Wantana Muangchan, 1999: 6) stated that executives and leaders need to have their vision. If

not, upon practicing in an organization ie budget allocation, there will be an approval. Thus, vision or future picture will take place after an analysis and determination of which in what direction of the unit, an organization, or the country. How can one execute to gain both the efficiency and effectiveness”.

Somchai Pakapaswitwat (1995: 169-171) stated that business in globalization must change in 3 C manner: C-Change, C-Competition, and C-Customer.

C-Change means changes as per business environment in a rapid rate and with expansion scope. Business execution must get into the era of new framework in proceeding (or so called new paradigm). This will lead to the changes in new business conduct structure in general.

C-Competition means changes in the form of competition limitlessly as business alliances or joint venture. One can set up branches or representatives overseas. Thus, business will face competition from all units on earth in order to find out sources for comparison advantage.

C-Customer means customers with change are customers with chances. They will have more choices for consumption or services more. New era customers will have higher education more than in the past. They select more and have more requests. Business needs to adjust in order to manage with more approach to the customers.

All of these reasons reflect the need for an organization in the business sector to get prepared for things with more attention. Long-term vision of the organizational leader will inform which direction to go for, how-to for an organizational survival, and how-to for the success.

Jutamas Limpai boon (1999: 56) summarized that vision is very important for an institute, to a unit, and to an organization, especially for business organizations. Vision is important for executives and leaders of an organization that they can not miss them. The aim is for them to lead an organization to achieve the success as well as to be able to adapt themselves to cope with the phenomena of changes in a good manner on a continuing basis.

2.1.5 Characters of Vision Possessor (Wantana Muangchan, 1999: 12)

- 1) Intellectual ability
- 2) Good imaginary
- 3) Experience learner
- 4) Innovation
- 5) Data synthesis
- 6) Strategic planning
- 7) Sensitivity to new things
- 8) Incentivization
- 9) Inspiration and ambition
- 10) Flexibility

2.1.6 Features of Good Vision (Wantana Muangchan, 1999: 12)

- 1) In-depth and a push for practice
- 2) Wide in scope
- 3) Far sighted
- 4) Ambitious
- 5) Achievable and informable to people concerned
- 6) Challengable for ability
- 7) Desirable
- 8) Focus on advanced practice
- 9) Prevention measure than suppression
- 10) Strategic-oriented with future-focus
- 11) Worthy

2.1.7 Levels of Vision

Vision can be divided into 4 levels (Wantana Muangchan, 1999: 13)

1. One can perceive their future career path as external perception of one's job and how-to if there is any changes.

2. One can perceive about oneself as internal perception on one's health and mind with how-to for development. It is a reflection of mind, disappointment,

fulfillment, etc which impact one's mind and how-to work under pressure, how -to solve problems, and how-to manage mind's quality.

3. One can perceive the future of an organization with an appropriateness, in order to study the impact on the unit ie impact on the progress of technology, from society, on personnel, and how-to execute.

4. One can perceive the future of an organization under globalization as the way to perceive overseas competitors. The one who can produce better quality product at a cheaper price will be more competitively advantage than the competitors.

2.2 Concept on Satisfaction

2.2.1 Meaning of Satisfaction

Drever, J. (1964: 256, quoted on Panida Wotang, 1999: 15) has defined the meaning of satisfaction as per the Dictionary of Psychology as the initial feeling when achieving the objective and the final feeling when achieving the goal with stimulus.

Benjamin B. Wolman (1975: 35, quoted in Panida Wotang, 1999: 15) stated the meaning of satisfaction as in the Dictionary of Behavioral Sciences, as the situation of feeling of an individual with happiness when one's need or incentive has been responded.

Vroom (1964: 99, quoted in Yaowaree Charoensawat , 2000: 25) stated that attitudes and satisfaction in one thing is replaceable. These 2 words mean the result gained from one's participation in that stuff. Positive attitudes demonstrates one's satisfaction in that stuff. Negative attitudes demonstrates one's dissatisfaction in that stuff.

Yaowaree Charoensawat (2000: 25) summarized that satisfaction means feeling from the need of an individual which has been responded to on a certain level. One can have positive feeling or negative one which is the same as attitudes.

Kriengsak Yiewyasat (1996: 11) summarized that satisfaction is an opinion or attitudes towards one stuff. It can be the feeling of the one who gets the service with their own experiences depending on their anticipation and the response to their needs.

Panida Wotanang (1999: 18) summarized that satisfaction means opinion or attitudes towards one stuff in a positive manner of an individual. One can express their feeling of like, willingness, happiness, value, and appreciation towards one stuff. It can be the feeling arised from one being responded in what one needs properly, in terms of physicality, mind, and society. This will lead to one's satisfaction in practising to achieve organizational goals.

Paruehat Singhaworakit (2001: 8) summarized that satisfaction means good feeling, feeling of like and happiness. It can mean good attitudes of an individual towards one stuff. If one is satisfied with any stuff, there will be a dedication in terms of physicality, mind, and intellectual to do such things.

Pornmalee Sinsomboon (2001: 9) summarized that satisfaction means happiness from work, both by executives, colleagues, or work systems.

The above stated meanings of satisfaction can state the meaning of feeling which has been responded by an expression of like, willingness, happiness, value, and appreciation of one stuff. It can be a feeling arised from an individual being responded to one's need which is proper both in term of physicality, mind, and society. It can give the feeling of positive or negative as well as that of attitudes.

2.2.2 Concept and Theory on Satisfaction

The theory of satisfaction by Gilmer (1966: 380-384, quoted in Panida Wotananag, 1999: 27) stated the concept on satisfaction in work in relevance to internal element ie. incentive, and external element ie rewards. In addition, satisfaction can occur from individual elements such as:

1. Gender: female tends to be satisfied in work more than male since they are in financial need and they have more ambition in career less than male.

2. Number of dependents: it has been found out that those with dependents in a large number will be satisfied with work less since they have pressure from financial circumstances.

3. Period of service: at initial stage of work, people tend to be satisfied with work the most. The trend will be less up to the fifth year or to the eighth year, when their service time is heightened. Work morale will be highest if they have worked over 20 years time.

4. Educational level: from the study in officers, it has found out that those without secondary school education will be satisfied with their work highest. On the other hand, there is no relationship between educational level and work satisfaction.

5. Personal traits: is another key issue which creates one's work satisfaction Thepanom Muangman and Sawing Suwan (1986: 6, quoted in Yaowaree Chareonsawat, 2000: 26) stated that elements external and internal to an individual will impact one's behavior. In practice, there will be a continuing effect. This can be possible both in satisfaction and dissatisfaction in an individual. If the effect is satisfied, the behavior will be repeated. On the other hand, if the effect is not satisfied, one will change to new behaviors.

Frederick Herzberg et al has proposed for Two-Factor Theory or Motivator;Hygiene Theory which is relevant to work satisfaction and dissatisfaction. They are (Soitrakoon (Tiewyanon) Attamana, 1998: 141).

1. Motivational factor: or job satisfaction, this is directly related to the job ie job success, acceptance, job progress, job responsibility etc. These are motivational factors and incentives for one to be willing to work for an organization.

2. Hygiene factors: or maintenance factors. This is a supporting factors for one not to be dissatisfied with the work. But it is not a stimulus for one to be more active in doing the job. It is the factor related to job environment ie policy and management of an organization, supervisor's control, interrelationship, salary, job security, work environment, and personal life, etc.

2.2.3 Elements Facilitating Job Satisfaction

Von Haller B. Gilmer has summarized elements facilitating job satisfaction in 10 items as follows: (Soitrakoon (Tiewyanon) Attamana, 1998: 141-142):

1. Security and safety: in terms of physicality, security, safety in doing one's job.
2. Work progress: chances for promotion from one's knowledge and ability.
3. Office and management: satisfaction in one's work place, reputation and procedure of that unit.
4. Wage: for wage and rewards must be the ones for job function in an equal basis which is publicly announced as well. The reward needs to be in line with goal of the operator.
5. Job feature or interest in job: satisfaction takes places when one works. One will be interested in job content of one's own. But people are different, thus, interesting job content varies from one to another. Nevertheless, there are some job features ie freedom in job, non-redundant job with chances to meet more and more people, etc. Meanwhile, there are a number of people who like the job with their own thought and with problem solution of their own.
6. Supervisor's control: this is important for one to be satisfied or dissatisfied with one's job. It is also the cause for one to rotate the job or even resign.
7. Social features: should the job operator is happy in working with others, there will be job satisfaction.
8. Communication: communication is crucial. How can the job get achieved is due to good working procedure. Ranges from planning, organizational management, personnel administration, order-giving, supervision control, coordination, and job evaluation. It can be stated that one's management duty can not take place without communication link.
9. Work environment: light, sound, air, working hours, all have to be proper with the job.
10. Remuneration or facilitative benefits: remuneration package upon resignation, services and nursing care, living place welfare, etc.

2.2.4 Satisfaction Measure

Satisfaction measure by questionnaire survey can be done in 2 patterns (Soitrakoon (Tiewyanon) Attamana, 1998: 146-147).

1. Overall satisfaction measure: to measure overall feeling in all aspects of job, by measuring the attitudes of job operator in the job on scale tool. The scale might be a direct question which is more popular in use.

2. Special aspect job satisfaction: this is a measure on attitude of job operator in one aspect of job ie salary, work environment, etc. Test should measure satisfaction via job descriptive index (JDI) by Smith, Kendall, and Hulin. This is the test for measuring the salary, job promotion, supervision control, work, colleagues. The test will use a number of adjectives to describe job feature and in which respondents will express their feeling in those jobs, by replying yes or no answer. In case of positive adjective, there is one's job satisfaction. If no is the reply, there is no score for the item. If yes is the reply with non-satisfactory adjectives, there is no score as well. The test will both describe one's job as well as one's job evaluation. It has been found out that scores from these test will be in line with those measuring other aspects of satisfaction ie absenteeism, in or out of job, and in some cases observation made by executives or managers.

2.3 Concept on Knowledge

2.3.1 Meaning of Knowledge

Good (1973: 325, quoted in Puangpetch Cherdchanpipat, 1998: 16) stated that knowledge is fact and truth. They are rules and information that one gets and collects.

Bloom, B.S., et al (1971: 271, quoted in Puangpetch Cherdchanpipat, 1998: 16-17) stated that knowledge is the issue on remembering some particular issue, some

methods, and some procedures. The objective of knowledge is to focus on psychology of remembrance. It is the link of process in new ordering.

Utumporn Thong-urai (1980: 191, quoted in Puangpetch Cherdchanpipat, 1998: 17) stated that knowledge is abstract in the process of remembrance psychology, new ordering, and frequent changes.

Knowledge means knowing about fact, rules, and structures arising from studying, searching, or knowing about places, things, or people from observation made, experiences with, or report of truth. They need to be clear and it takes time (Encyclopedia Edition, 1977: 531, quoted in Panida Wotang, 1999: 41).

Prapapen Suwan (1977: 10, quoted in Panida Wotang, 1999: 41) stated that knowledge is initial behavior which the learner might only remember by training or by sensational organs ie seeing, hearing, etc. These initial knowledge are those dealing with definition, meaning, fact, theories, rules, structures, and methods for problem solution.

Wichai Wongyai (1980: 130, quoted in Panida Wotang, 1999: 41) stated the meaning of knowledge as the expression of one's intellectual capability in remembering via seeing and hearing. These knowledge are fact, rules, and definitions.

From the meaning of knowledge as stated above, it can be summarized that knowledge means acknowledging on fact, rules, and details of data. This is the learning process, training, as well as experiencing which one has gained and collected for further transfer.

For this research, knowledge means knowledge on environmental economy measure in pollution prevention by entrepreneurs in industrial estates.

2.3.2 Kinds of Knowledge

Butler has divided knowledge in 3 kinds (Methee Pihanthanon, 1980: 44).

1. Posteriori knowledge: this is the knowledge based on experiences and observation.

2. Experimental knowledge: this is the knowledge similar to the first one, but this is not relevant to the final summary from experiences and observation. It deals with knowledge which creates experiences as a way to satisfactory experiences.

3. Priori knowledge: this is the knowledge with self-explanatory one. It is the knowledge which assumes that all principles are true. It does not perceive the proof from any observation by taking in experiences or tests.

2.3.3 Level of Knowledge

Plato divided knowledge in 4 steps (Ratana Tanboontek, 1987: 68-69).

First step: the lowest level which is the one in the world of tales and stories which one hears and has imagination as per one's thought. It is a personal knowledge which can not be believed as correct, comparing to the mind world of knowledge. This is the truth for an individual only.

Second step: this is technical knowledge which one knows how things are. This is the belief which can be tested or can be brought into practice. One can learn from experience that if one does this, what the result will be. One will know that if one does this, it will be correct. The correctness of knowledge on this level is also true to others.

Third step: this is theoretical knowledge with reason of why this happens. As the scientists know theories and can clarify why television works and how to repair if something goes wrong. This is different from technicians in general.

Fourth step: this is the knowledge which is correct and certain. One knows that one knows, as the knowledge is derived from theories and data. This is then the best possible answer. It can be evaluated, tested, and clarified correctly. It is a universal knowledge which is the highest point of intellectual world of true goodness.

2.3.4 Knowledge Measurement

1. Knowledge, remembrance

Knowledge particular on subject content

1.1 Knowledge on meaning of words

1.2 Knowledge on various facts ie time, event, persons, places, and origin, etc.

2. Knowledge on methods and procedures of one particular stuff

2.1 Knowledge on various patterns

2.2 Knowledge on trends and ranking

2.3 Knowledge on categorizing and grouping

2.4 Knowledge on criteria

2.5 Knowledge on rules and regulations on one procedure in particular

3. Knowledge on summarizing the concepts and structure of one stuff

3.1 Knowledge on rules, description of value, prediction, or definition of the stuff one perceive

3.2 Knowledge on theories and structures

4. Understanding

4.1 Translation (from one to another pattern by keeping all meaning correctly)

4.2 Interpretation (by clarifying or rewriting the content for easy understanding)

4.3 Expansion of content

5. Application

An application of key content in actual situation

5.1 Analysis

5.2 Element analysis

5.3 Relationship of elements analysis

5.4 Principle or method of elements analysis

6. Synthesis

6.1 Action as a media for others to understand the meaning

6.2 Action related to plans or offers as per various methods

6.3 Development: relationship between elements ie. How they combine by relying on which key relationship

7. Evaluation

7.1 Decision-making on internal event as criteria

7.2 Decision-making by external event

Tools for knowledge measurement are various and each type is proper in a different manner. There are 2 types of test (Wichien Ketsingha, 1980: 14, quoted in Puangpetch Cherdchanpipat, 1998: 18-19)

1. Subjective or Essay Type
2. Objective or Answer Type which means the test has been designed for short reply or by multiple choices
 - 2.1 Right-wrong reply
 - 2.2 Completion reply
 - 2.3 Matching reply between statements of 2 columns
 - 2.4 Multiple choice: with only one complete and correct reply

From above principles, upon the need to measure knowledge in one particular issue in practice, there must be a building-up of tools to cover such content, in order to achieve the completion in measuring knowledge, understanding, etc. In this study, the researcher has chosen the yes-no reply as it is appropriate for data collection and in line with the timing in field research.

2.4 The Concept of Awareness

2.4.1 The Meaning of Awareness

The Dictionary of Education (Carter V. Good, 1973: 54, quoted in Dolaporn Puekkong, 1998: 23) has defined the meaning of “awareness” as the action or acknowledgement of consciousness.

Prapapen Suwan (1977: 14, quoted in Dolaporn Puekkong, 1998: 23) stated that “awareness” means one can think about or feel about one thing, one event, or one place., in one state of mind.

Department of Academics, Ministry of Education (1978: 4, quoted in Dolaporn Puekkong, 1998: 23) stated the meaning of “awareness: as consciousness of one existence but without detailed information.

Wichai Wongyai (1980: 133, quoted in Dolaporn Puekkong, 1998: 24) stated on the meaning of “awareness” as cognitive domain of lowest behavior. But this meaning does not relate to one’s remembrance but it means one’s state of mind.

From the meaning of awareness, one can summarize that it is the state of mind in relation to one’s feeling, opinions on one event, by speaking, writing, or others. One can take time or get in experiences or community environment. Or external stimulus can be a factor for one to gain awareness or remembrance by acknowledgement.

2.4.2 Awareness Measurement

Awareness is a behavior relating to one’s consciousness of something, recognition, etc. It is a sensitive behavior relating to the feeling and emotion. Thus, in using the measurement or evaluation, one must take into consideration the principle and method as well as special technique. The aim is to measure knowledge and emotion in a valid and reliable manner. The tool to measure feeling are various, ie. (Dolaporn Puekkong, 1998: 25-26):

1. Interview: interview might be a structured item one by building up the question and the choices or in an unstructured item one with only key heading, of which respondents have liberty and freedom in replying more and of which facilitates the discussion.

2. Questionnaire: questionnaire can be open one or close one or mixed

3. Checklist: this is a check on agree or disagree, yes or no

4. Rating scale: this is proper to measure emotion and feeling with intensity of more or less in degree.

5. Semantic differential technique (S.D) this is the language meaning measurement by Charles Osgood. It covers a wide range of item. It composes of

“concept” with opponent adjectives in pairs. The interval is indexed via numbers. The characteristics reflect the pole. They are grouped into evaluation, potential, and activity types.

From the above stated principles, upon the need for measurement of awareness in practice, the tool has to be built in order to cover the key content. In this study, the researcher has used the awareness measurement in negative and positive questions in order to fit data collection process and timing of field research.

2.5 Industrial Estates

2.5.1 The Meaning of Industrial Estates

Somjet Tinnapong (1992: quoted in Paitoon Pimdee, 1999: 45) defines industrial estate as the town area comprising only of industrial plants, commercial areas, and living zone. It is equipped with public utility, laws for management and licensing, and benefits. The areas are linked with economic growth decentralization. It is aimed to upgrade one’s income and educational level, as well as balance of industrial development with environment concern.

Wichai Toosuwanichinda (1977: quoted in Paitoon Pimdee, 1999: 45) stated the meaning of industrial estate as the allocation of land for industrial production. It is a gathering of industrial plants in proportional manner. State will provide facilities both in terms of transportation and utilities ie electricity, water supply, telephone, postage mail, etc. It is also a place for living zone, public park, sports field, parking space, offices, market, shops, commercial houses, in an orderly manner.

Industrial estates is legally certified as the area for industry enterprise and other relevant enterprises by Industrial Estate Authority of Thailand as per Act no. 4 year 1979 (Pollution Control Department, 2000: 7-8)

“Industrial Estate” means general industry zone or export zone”

“General industry zone means areas designated for industry enterprise and other enterprises beneficial to or related to industry enterprise”

“Export zone means designated area for industry enterprise and other enterprises beneficial to or related to industry enterprise for overseas export activity”

Industrial Estates have been established under the Act of Industrial Estate Authority of Thailand year 1979 by its own investment or joint venture with the private sector. The organization provides support for land procurement, utility development and management.

In setting up an industrial estate or in project expansion, the owner of the project must report their own EIA (Environmental Impact Assessment) by getting approval from the Board of National Environment, prior to getting the approval from the Cabinet. For an industry enterprise in the estate, the owner of the estate needs to get the approval from Industrial Estate Authority of Thailand. The entrepreneurs will gain privileges, incentives, and Facilities ie. waiver for import and export tax for machinery, tools, equipment, elements, raw materials, value added tax, excise tax, etc. They will gain more privileges if their projects have been supported by the Board of Investment.

In setting up industrial estate (Paitoon Pimpdee, 1999: 49), there is an objective to allocate the land for groups of industry in an orderly manner. It will be divided clearly between industrial and living zone. There will be the provision of utilities in need, as well as other supporting services ie postage mail, banks, shop houses, etc.

The concept of setting up industrial estate can be summarized by Paitoon Pimdee (1999: 46) as per following objectives:

1. To set up industrial plants which will mutually employ basic utility for maximized benefit. The aim is for the state to save their budget in providing these facilities.
2. To group the industry in the same zone which facilitates city planning as not to intervene with living area or be in inappropriate areas.
3. To have a control on pollution from plants in an efficient manner most possible.
4. To develop domestic industry in a systematic and orderly manner.

2.5.2 The Meaning of “Industrial Estate” are as follows:

- 1) Areas which are legally certified as industrial areas and other entrepreneurs related to industry conduct.
- 2) Areas which are ready in terms of utility ie water supply, electricity, central waste water treatment, etc. for investors to set up their industrial plants promptly.
- 3) Areas which entrepreneurs will get benefits, incentives, and facilities as per the Act of Industrial Estate Authority of Thailand and they will also gain more benefits for BOI promoted projects.
- 4) Areas which are served in terms of utility and facilities on a continuing basis by Industrial Estate Authority of Thailand.

2.5.3 Roles of Industrial Estates can be briefed as follows :

- 1) Being strategic production base with production factors which create quality products and global competitiveness.
- 2) Being the state mechanism in decentralizing the industry and growth into the regions.
- 3) Being the state mechanism in maintaining and promoting the quality of environment arised from the industry.
- 4) Being the state mechanism in protecting and alleviating perils arised from industry.
- 5) Being the state mechanism in setting up the system and regulation in using the land in particular and in part as city planning and land use.
- 6) Being the state mechanism in promoting and supporting general industry, export industry, as well as basic industry.

2.5.4 Benefits of Industrial Estates Include:

- 1) Promote the development of industry as well as SMEs in Thailand.
- 2) Incentivize the investment in and out of the country.

3) Promote the decentralization into the countryside in order to reduce the density in big cities.

4) Provide the use of local resources with employment as income increase for an individual and tax increase for the state.

5) Enable the ability to deal with environmental problem effectively, can benefit from economy of scales and reduce the impact from pollution problem towards quality of life.

6) Provide economy of scales in investment in basic structure system.

7) Be ready for infrastructure with one-stop prompt service for cost reduction of entrepreneurs.

8) Set up the location of enterprises and location of industrial plants.

2.5.5 Benefits for Entrepreneurs in Industrial Estates

Entrepreneurs in industrial estate will gain benefits and facilities as per the Act of Industrial Estate Authority of Thailand year 1979 and Notification No.3 year 1996 as follows:

1) Entrepreneurs who are Thai and Alien may get the approval to hold the right of land in the estate so that the entrepreneurs can conduct business as per their land which Industrial Estate Authority of Thailand deems appropriate. Though the land might be more.

2) Entrepreneurs are allowed to bring in aliens as handicraftsmen, experts, spouses, and other dependents for living in the Kingdom of Thailand as per the numbers and within the time frame deemed appropriate by the committee of Industrial Estate Authority of Thailand.

3) Aliens who are handicraftsmen and experts will be allowed to stay in the Kingdom as per the Act No. 45 as per the appointed position approved by Industrial Estate Authority of Thailand throughout the time allowed to be in the Kingdom.

4) Industrial entrepreneurs with their origin outside the Kingdom will be allowed to transfer money out of the Kingdom into foreign currencies when such money is the imported capital, dividends, benefits earned from such capital, overseas loans and overseas loans committed by industrial entrepreneurs.

5) Approval for the set up of plants as per the law of industrial plants and for the set up of the building as per the law of building control within the authority of Thailand Industrial Estate.

Industrial Estate Authority of Thailand is the unit of state-enterprise under the Ministry of Industry. It is directly responsible for local industry development by providing appropriate land for setting up or expanding industrial estates, land improvement, design, construction of infrastructure system, control of work done by entrepreneurs as per rules, regulations, and law of plants. As well as supervise the operation which might impact the environment. Now there is the set up of industrial estates under the supervision of Thailand Industrial Estate for 27 estates , totaling in 1,819 plants as follows:

Table 1 Nationwide industrial estates of 27

Region/ province	Industrial estate	Number of plants
1. Central areas		
- Bangkok	Lad Krabang	193
	Anyathanee	32
	Bangchan	74
- Samutprakarn	Bangpoo	379
	Bangplee	145
- Samutsakorn	Samutsakorn	84
- Rachaburi	Rachaburi	1
- Saraburi	Saraburi	5
	Kaengkoi	1
- Ayudhaya	Bann Wah (Hi Tech)	53
	Saharatana-Nakorn	47
	Bang-pa-in	63
2. Eastern areas		
- Chachengsao	Plangyao (Gateway City)	35

Table 1 Nationwide industrial estates of 27 (cont.)

Region/ province	Industrial estate	Number of plants
- Chonburi	Wellgrow	111
	Laem Chabang	103
	Chonburi (Bowin)	33
- Rayong	Amatanakorn	172
	Pinthong	9
	Mabtaput	62
	Eastern	27
	Padaeng	3
	Eastern Seaboard	79
	Amata City	18
	3. Northern areas	
- Pichit	Pichit	2
- Lumpoon	Lumpoon	81
4. Northeastern areas		
- Khonkaen	Khonkaen	1
5. Southern areas		
- Songkla	Southern (Chalung)	7
Total		1,819

Source: Directory of industrial plants under Industrial Estate Authority of Thailand

2.5.6 Situation of Problem in Pollution Management of Industrial Estate

(Pollution Control Department, 1999: 8-9)

1. Waste water problem mostly arised from

1.1 Central waste water treatment system with appropriate size and efficiency due to new set up or due to an expansion of the plants in the estate. There is a delay in an improvement of central waste water treatment system or there is an inability to load an increasing pollution.

1.2 Waste water sources are so deteriorated that they can not load the burden of pollution in the estate any more.

1.3 Some plants in the estate do not have the pre-treatment or have an inefficient one. Once emit the waste water into the central pool, it will impact the pool.

1.4 Central pool has not been control strictly and appropriately, thus it gets deteriorated and their treatment efficiency is worse. Some of them do not have constant quality water check prior to the emission.

1.5 Biological treatment does not get a continuing process thus the system gets failure that it can not treat the waste water as per the standard.

2. Air pollution problem, it has found out that

2.1 There is air pollution in dust, bad smell, smoke, gas, vapour of chemical from production process of the plants, burning of fuel, and municipal waste incinerators. This is due to the system of gathering and treating air pollution has no or has little efficiency. People living around the estate are in trouble with symptom of dizziness, vomit, tight chest, hard breathing, etc.

2.2 The expansion of area in the estate or the set-up of plants produce more air pollution which exceeds the ability of the atmosphere. There is also no EIA report.

3. Hazardous waste pollution problem

3.1 The estate in some parts do not have municipal waste incinerators or area of solid waste treatment. They also do not the system for solid waste and hazardous waste segregation. Each plant has to take care of this themselves. General solid waste is mixed with hazardous waste and there is a hiring of private sector, municipality, local administration organization, to collect them and get rid of them. This is however done without any control and the elimination process is also not in accordance with the municipality principle. There is also a smuggling of waste toxic to be thrown out side the estate.

3.2 Incinerators: some part of the solid waste is not adequately efficient and not systematic enough for air pollution control.

3.3 Local regulatory body responsible for the management of waste from the estate do not have detailed data on type, character, and qualification of the

solid waste. Thus, the officers can not check if there is any smuggling of hazardous waste from the estate.

4. Law problem

Entrepreneurs in the estate do not understand of some do not know about the notification of Ministry of Industry No. 6 (1997) issued under factory Act 1992 on the issue of an disposal of waste or unused materials. As well as the notification of Ministry of Industry No. 1 (1998) as per the Act of factory 1992 on the issue of an elimination of waste or unused materials. Thus, there is no segregation of hazardous waste and waste materials. This is the cause of wrong and illegal waste management.

5. Other problems

Some of the estates do not gather or incompletely gather data in regards to pollution management ie data on waste water treatment system, data registration of entrepreneurs, and lists of waste or unused materials as per the notification of the Ministry No. 6 (1997) and No. 1 (1998).

2.6 Use of Environmental Economic Measure in Pollution prevention

The deterioration of natural resources and natural atmosphere arise from many reasons, both from the producers and the consumers. One of the causes is over-consumption or over-utilization. The theory in environmental economics explains that over-utilization has caused by bias and market failure. For instance, a plants cause pollution but they do not take into consideration the cost as it is external cost which creates trouble for others. Or the state will have more expenses in supervision of waste water and air pollution from such bias. This plant then produces the goods over the “appropriate level” (Direk Patamasiriwat, 2001: 95). The finding out of balance point is something difficult as the nature of resources will differ from goods and services as follows: (Chutima Sintanaweewong, 1998: 53):

1. The use of resources will create externality at all times, in form of environmental resources. But the society does not be aware of this. Since this impact is external one and is not on the level of seeable. It can not determine as well for the responsables. This is the same as the use of vehicles which emit gases into the

environment for a long time, by which the past impact is not so clearly seen as the one at present.

2. An impact on the environment is transferable and is limitless. Areas which might not be the cause can also get impacted. This is the same as gases being emitted from the vehicles which can be transferable in every area.

3. Environmental problem is non-market valuation as there is no market which make the end of demand and the supply meet. There is no middleman for negotiation as other goods. The technique of estimation is case by case.

4. Environmental problem takes time and can be accumulated up to a serious degree. It does not take place immediately, thus it also takes time to get the remedy.

5. Environmental problem occurs from the action of part of people in the society. But there is no determination of the responsables in an efficient manner. Once there is a problem, it is then the social one, in which an individual can not solve but it must be solved by everyone simultaneously.

2.6.1 Economic Instruments for Environmental Management

Economic instruments for environmental management is a new word which takes place recently. One may not get acquainted to. But soon, people will accept it. In the widest meaning, it is the determination of measures and incentive system to change the behavior of production and consumers as the “boon” to the environment. For instance, measure in consumption reduction, on reduction of pollution, on reduction of solid waste/ unused materials, recycled materials, promote the plants to use the clean technique of production. The alternatives are environmental tax, fee collection for solid waste or waste emission, loans for environment, investment in environment, fine, deposit-return system, clear property right, etc. The economy measure is the new one which attracts interest from various countries. It is used with measures by law and is the supplement to preserve the environment for goal achievement (Direk Patamasiriwat, 2001: 93-94).

The use of economic tools has the aim to reduce bias from over-utilization of resource ie collection of pollution tax, fee charge, etc as per the principle of polluter

pays principle or beneficiary pays principle (Direk Patamasiriwat, 2001: 95-99,101). These tools are:

1. Tools in Finance

The use of this tool is based on the base of ability to treat the pollution as per the designated standard. They are:

1.1 Charge system

The system has determined the polluters pay principle or pay for services from environment ie production unit or industrial plants. Thus, the damage to the environment will be included in the operation cost of the production. Once the cost is increased, the unit will find out the method to reduce the amount of pollution emission. For instance, the change of technique of production to reduce the amount of waste water or to build up the treatment system of waste prior to the emission. This is voluntary job by the private sector for their own benefits and is a benefit as well for the society to have production amount and natural resource use in a reduced base with appropriateness.

Using the service charge system which is based on production unit which is capable of pollution treatment as per required standard. Should the plant (pollution source) not enable to act as per law, the unit will pay for pollution emission in the service rate or for emission rate which differ in types and amount of pollution emitted or sent in for treatment. The fee collection can be in one of the followings:

- 1) User charges
- 2) Effluent charges
- 3) Fine

The set up of rate of collection, by economics principle, must be in line with marginal damage cost (MDC) occurred to the society. For the fine (used in the unit emitting waste over the standard value) must be determined on a high basis as it is a warning system. Should the fine be lower than the service, the entrepreneurs will pay for the fine which is better than paying for the treatment cost which is not good for the society:

1.2 Environmental tax: there are in the following types:

1.2.1 Product charge: as a signal for the consumers to know the cost of the environment in order to be incentivized for consumption reduction or economy use.

1.2.2 Factor input tax ie. oil refinery plant will use low grade raw oil for refinery process which contain high sulphur amount. With the tax, it will incentivize the plants to consider using the better grade oil with less sulphur amount.

1.2.3 Tax differentiation ie. the state will determine the lower excise tax for unleaded oil than leaded one in order to motivate drivers to change their behavior.

1.3 Administration fee for environment

This administration fee for environment means the money from the enterprises with the condition of relationship to the cause of environmental problem. It might be used with the license request. It might be once a year or on an annual basis.

The fee may differ from area to area, from amount of and type of pollution. This fee will include fee in control and authorization ie registration fee from chemical substances, execution fee, and control cost of rules, etc. The fee may be an incentive ie after proving that the performance after a few years causes a good environmental management, there might be a reduction in fee as a motivation as well as the reduced insurance premium for a good insured.

2. Marketing Tools

This is the tool which is based on the market system with pricing mechanism as the determiner. The state has the duty of only promote and support the market mechanism to work in a systematic and continuing manner. This also includes the environmental quality watch.

Therefore, marketing tools used in present environmental management are:

2.1 Deposit refund system

This is the system which determines the consumer to pay for the deposit. In certain purchase ie. battery, tyre, plastic bottle, glass bottle, etc so that they will not litter but to refund these materials for “recycling”. Should someone not cooperate with the system, they will be fined for “throwing away taxation” in some

sensitive areas ie natural park has initiated the condition for deposit from tourists bringing in liquor bottle/ drink into the park as an incentive to return them and not throw them away in the park area, as it is the burden to the park officers or damage the beautiful environment.

Deposit refund system is one of the measures which supports the “recycling”. Should it be proceeded in a systematic manner, it will benefit the society in 2 ways (1) reduction of littering ie battery with metal substance which is bad for the ecology of soil and water. Should there be no recycling, old tyre will be the cause of rats and mosquitoes. It will destroy the scenario as well. Though they are covered under the ground by the municipality, it is also a problem of area as it consumes much space. The service time is also shortened (2) recycling will increase value in economic term which is good for the society. There will be a hiring and a change of “waste” to “good” stuff.

This is the concept in pollution prevention from production until expiry date or life cycle approach with at least 2 patterns:

1. Deposit refund system: in case of goods purchase and return back the container. This has been used in various countries with many products ie battery, tyre, bottle, for the recycling.
2. Deposit refund system with waste evaluation in advance: this has to be paid annually or every end period, in order to guarantee that the polluters will control and get rid of pollution on a continuing basis.

Performance bond is used as the guarantee which is mostly used with plants or units with potential of pollution for disasters ie explosion and leakage of toxic substances. These enterprises have to deposit by these bond or guarantee letters. The aim is to incentivize them to comply to the measures strictly. Should there be an evidence that their performance is safe and does not destroy the environment, the state will release some of the conditions.

2.2 Tradable pollution permits

This is the concept of control on amount of pollution emission on an acceptable level ie emission of carbondioxide in the atmosphere. The state has determined the quota as a whole and for each plant. Since each of the plants is capable of environment management on a non-equal basis. Some emit pollution less than their

quota and some over. The over one has to have tradable pollution permits with the cost of punishment measure for those of less efficiency. Meanwhile, it is also a reward for the units with efficiency in environmental management. The permit then becomes something of “high price”. Market mechanism will determine the price of the permit without state intervention. The state only controls quota amount of emission on a whole basis (tradable pollution permit mostly used in air pollution emission).

Making the permit a tradable pollution permit as the “market” means there are a number of plants, some of which need more quota. Some have their left-over quota so they can trade. However, there must be a facilitative condition for the market to operate.

The disadvantage of tradable pollution permit is the bias for the new units. They are the plants without quota from the beginning, therefore, they need to buy the permit from the previous plants. Unless the state allows for quota amount for new plants. There are some conflicts in this said policy as it means the more the quota, the more the pollution emitted. Thus, pollution level is not in an acceptable range. In practice, the state would have to review the rules every 5 or 10 years for fairness of new plants.

2. Tools to Promote the Incentivization of Environmental Management

This is the tool designed for incentivizing the polluters to change their behavior. Mostly, it deals with production system. They are:

2.1 Subsidy

Financial support to entrepreneurs or plants with no return. However, the condition applied is for the plants which has an intention to install pollution eliminator via clean technology or to reduce waste emission with an evidence and index. This counts as positive measure.

2.2 Soft loan

This means interest rate is lower than the one in the market. It serves as an incentive for the polluters to change their technique via the change of the technics or tool installation which requires a high amount of investment. Loans with

out interest or with low interest will incentivize the entrepreneurs directly. These investment is specially for the adjustment of technology and production process.

2.3 Tax allowances

Yielding tax privileges for enterpriers upon their use of pollution reduction measure or of their production without damage to the environment ie permit to deduct the depreciation faster, tax waiver, tax deductibles for the imported equipment from overseas. It can be a form of tax credit (expense for machines/ tools of which the state allows to less from tax base so as to reduce the tax burden).

Economic tools as above stated has been employed on a periodical basis for some time in foreign countries. Mostly they are those in developing countries. The application of “economic tool measure” is less, however, the trend is rising and many countries are learning from the experieces of those developed one. The design of the tool needs to take into account the acceptance by people together with the creation of “institute system” in order to publicize and to conduct the campaign for everyone to understand. Economic tools which are most popular are the collection of pollution fee and subsidy.

Some good qualifications by economic tool (Direk Patamasiriwat, 2001: 94) include:

1. Measure influencing “incentive” directly to an individual (production unit and consumers) for the resource users to be aware of the value and the price of resources, in order to create care in resource use.
2. Alternatives and freedom in adjusting to the unit (producer and public).
3. Low state expenditure in monitoring and supervising.
4. Ability to design the tool to be in line with the polluters pay principle or the beneficiaries pay principle ie. tax collection and environmental fee: this enable the state to have income which can be paid as a promotion for environment or a reduction of tax collection in other types.

2.6.2 Tools for Environmental Management Available in Thailand

At present, tools in use mostly are the ones under the measure of command and control. (Table 2)

Table 2 Tools for environmental management and natural resource management of Thailand

Problem of environment	Tools as per measures	
	Command-and-control	Economic incentives
Industrial pollution		
Air pollution	<ul style="list-style-type: none"> • standard for pollution emission for new vehicles • determination for new vehicles in year 1992 onwards to install catalytic converter • standard of pollution for vehicles in use • standard of pollution emission from the source • standard of ambient air quality • standard from air pollution from power plant (new) • standard for intensity of cresol emitted from the plants • standard for sulphurdioxide emission from fuel burining of general plants except power plant • standard of air pollution from crushed-stone plant • standard for dust in general atmosphere 	<ul style="list-style-type: none"> • tax reduction for imported tools, machines, which prevent environment • determination of tax rate to be in a different rack between leaded gas and unleaded one, and between diesel with high and low sulfur

Table 2 Tools for environmental management and natural resource management of Thailand. (cont.)

Problem of environment	Tools as per measures	
	Command-and-control	Economic incentives
	<ul style="list-style-type: none"> • standard for control on emission of air pollution from solid waste incinerator 	
Toxic Substance	<ul style="list-style-type: none"> • announcement for toxic material (old grease) • control on import and export or having in possession and disposal of hazard materials 	<ul style="list-style-type: none"> • different tax between new and old battery • different pricing system for new battery upon the return of the old one
Waste water	<ul style="list-style-type: none"> • standard for waste water quality 	<ul style="list-style-type: none"> • tax reduction on import of machinery, equipment, for pollution treatment • privileges for investment promotion and the exempt of income tax for the plants in the designated estates • user fees
Solid waste	<ul style="list-style-type: none"> • control on the disposal of solid waste 	<ul style="list-style-type: none"> • user fees
Hazardous waste	<ul style="list-style-type: none"> • set up of service center for industrial waste disposal • build up of incinerator for contaminated solid waste from hospital 	<ul style="list-style-type: none"> • Transportation, testing, treatment , and disposal fees

Table 2 Tools for environmental management and natural resource management of Thailand. (cont.)

Problem of environment	Tools as per measures	
	Command-and-control	Economic incentives
Community pollution		
Air pollution, smoke	<ul style="list-style-type: none"> • standard of air quality in the ambient 	None
Waste water	<ul style="list-style-type: none"> • standard for quality of waste water 	<ul style="list-style-type: none"> • User fees
Solid waste	<ul style="list-style-type: none"> • control of solid waste disposal 	<ul style="list-style-type: none"> • User fees

2.6.3 Economic Tools Proposed for Recycling in Environmental Management in Thailand (Table 3)

Table 3 Economic tools proposed for recycling in environmental management in Thailand

Problem in environment	Tools proposed for recycling
Water resources	<ul style="list-style-type: none"> • Water pricing
Water pollution	<ul style="list-style-type: none"> • User fees
Air pollution	<ul style="list-style-type: none"> • Administrative fees
Toxic substances	<ul style="list-style-type: none"> • Registration fees
Hazardous waste	<ul style="list-style-type: none"> • Administrative fees
Solid waste	<ul style="list-style-type: none"> • Product charges

Source: Environmental Research Institute, Chulalongkorn University (2541)

2.7 Related Research Finding

From the literature review, the researcher has not found any study on “Vision and Satisfaction in Pollution Prevention Toward the Economic Measures Among the Industrial Entrepreneurs in Industrial Estate of Thailand”. Therefore, related research papers can be collected as follows:

2.7.1 Related Research Finding on Vision

Atthitarn Chamkam (2000: abstract) on the study of “ Vision of executives of private hospital: case study of Samitivej Hospital, Bumrungrat Hospital, and Bangkok Christian Hospital”. It has been found out from the study that executive’s vision of private hospitals mostly is on international level. It comprises of clear goal and objective. As well, there are quality management and execution system, facilitator, prompt service with care and quality. There are modern information technology and communication system, team work, close cooperation, both on state and public part. There are communication both in and outside of Thailand. There are human resources management system with quality and appropriate procedure. There are clear structure with academic research sources. There are quality libraries with high level of modern technology, both direct and in direct. There are trainings and encouragement suitable for time and occasion. There is fairness based on standard of occupation under morale and ethics. The most important is the vision of executives in the future for profit return to the society in every patterns one can possibly do.

Thitinan Boonyapap (1999: abstract) on the study of “ Vision in television in Thailand after year 2000 (2000-2025), which can be summarized that:

1. Vision in competition and business environment of business in radio and television of Thailand after year 2000 will be as per the trend of country economy. Future competition will be more fierce and local television will play more key role in responding to the need of local viewers. It has also found out that the said business lacks the philosophy in proceeding the business in a clear manner. But from the

determination of the Act 40 as per the constitution year 1997, Thailand will have clearer philosophy thereof. The country will also get ready for the planning and the strategy in business proceeding after year 2000 as well.

2. Vision in technology and system of signal for radio and television in Thailand after year 2000 should remain unchanged. As this requires huge amount of investment. Thailand has still faced the economic depression. Upon economic recovery, the trend for technology and telecommunication signal will get developed in various aspects. There will be new types of signals in the future.

3. Vision in content of the program after year 2000, overall, television program in the future will get changed for the better. There will be more content in the program to suit viewers' interest. Upon economic recovery, sponsors will be interested in and sponsor for content program more.

Nipon Soheng (200: abstract) on the study of "Vision in Economic Development: Comparative Study of the Leaders, between Pol. Major Chatchai Chunhawan, Mr. Anan Panyarachun, and Dr. Mahathir Mohammed. It has found out that for Thai prime minister, their background in family, education, and attitudes in political experiences are quite similar. However, this will be different from the background of Dr. Mahathir who is quite conservative in the upbringing process. His education is in the system of colony and he does not have diplomatic experiences overseas. However, the 3 leaders have the same vision in pushing the country for a new industrialized country, as well as being the hub for economic growth in South East Asia Region. They will support the concept of economic cooperation in the region more.

Parichart Sonthichai (1997: 83-86) on the study of "Vision of leaders in the field of nursing care: case study of Assistant Professor Dr. Vichien Taweelap. It has found out that factors influencing the leader vision in nursing care field arise from internal factors. They are intellectual level, love in learning, knowledge and understanding in nursing care field, being experiences in knowledge of nursing care field. For external factors are lack of nurses, influence from NESDB plan, influences from overseas concept, etc.

Boonyoo Kohpornprasert (1997: 222-226) on the study of “Vision in Public Relation year 2010 of SET firms”. It has found out that

1. PR officers, PR executives, and high-ranked executives of SET firms have similar vision in PR activities on high level.

2. PR officers, PR executives, and high-ranked executives of SET firms have their demographic data differently. Overall vision in PR is not different.

3. PR officers, PR executives, and high-ranked executives of SET firms used to be trained in PR and overseas seminar as well in PR activities. The higher the executive rank, the more training experience they possess.

4. PR officers, PR executives, and high-ranked executives of SET firms have their behavior in exposing to news and information in advertisement and PR differently. They have their PR vision in a similar manner. Nevertheless, their behavior for news exposure is different. The higher the exposure, the more PR vision they possess.

5. PR officers, PR executives, and high-ranked executives of different nature of firms have the same size of organization but with different capital fund , but the same PR vision.

6. PR officers, PR executives, and high-ranked executives of different business with different status and structure of PR unit, will have their PR activity differently, but their PR vision does not different.

7. Three independent variables are experiences in seminar/training in PR, types of consumer goods, behavior in news exposure on HR issue, will explain PR vision in PR personnel of the organization for 8.87%. Variable in type of consumer goods have an influence on a negative aspect to the vision of PR in PR personnel.

8. PR officers, PR executives, and high-ranked executives of an organization have the same direction of how PR in year 2010 would be different from the one now. However, most of the trend in PR activities will expand and will be more than now.

9. PR Vision in year 2010 of SET firms in an overall picture is that “an organization will create the desired image as a key issue. The focus will be on proactive PR, with long-term PR planning, medium as well as short term one. The stress will be on electronic media more and there will be more budget for media purchase for

news dissemination. PR unit of the company will have a direct report to CEO and PR team will have their team-oriented attitudes.

Thieng Miedthaisong (1999: 58-60) on the study of “ Vision of executives in Rachapatr Institute”. It has found out that

1. Vision of the executives in term of vision creation, vision dissemination, compliance with vision, are on medium level.
2. Vision of the executives in Theory X and Theory Y of McGregor (1960) has been adjusted from the questionnaire by Associate Professor Dr. Naowarat Wilaichonplae in 3 dimensions. They are vision creation, vision dissemination, compliance with vision, are on medium level.
3. Vision of the executives are different with statistical significance at 0.05.
4. Vision of 3 dimensions in vision creation, vision dissemination, compliance with vision, are different as categorized by the concept of Theory X and Theory Y. The size and the experiences of management is different at statistical significance at 0.05.

Arom Romyen (2000: 132-134) on the study of “ Factors influencing the relationship with vision of the committee of local administrative organization towards development of HRD, case study of Tambon Chumporn. It has found out that their vision is as follows: in terms of demography, it has been found out that good child bearing with quality is more important than a number of offsprings. In the future, the family has to be ready for child bearing and assistance to elders. In terms of public health, everyone has to be serve on an equal basis. Poverty must not be an obstacle for health care service. In terms of education, children and youth needs to finish their 9 years education. Every village needs to be knowledge-based village. There must be many sources of information. On skilled labors, there must be both experty and ethics. For society, culture, and spirit, family institute needs to be warm, firm , and safe from drug addiction. Independent variables having relationship with vision of the committee of OrBorTor towards HRD with statistical significance at 0.01 are modernity and leadership, while both factors have positive relationship and prediction on vision for 15.36%.

2.7.2 Related Research Finding on Satisfaction

Naree Chuangsawang (1996: 94) on the study of “Relationship between hope and satisfaction in life pattern of women with rare chance of pregnancy”. It has been found out that hope and family income on average per month has a positive relationship with satisfaction in life patter of these women at statistical significance at 0.001 and 0.01 . It has also found out that numbers of medical treatment in these women and time period of their pregnancy has a negative relationship with satisfaction in life pattern of these women at statistical significance at 0.01, 0.001 and 0.01.

Somrak Thongsuwimon (1996: 76-80) on the study “ Life satisfaction and life planning on single female state officers, under the supervision of Ministry of Education, Bangkok”. It has found out that the samples have their satisfaction in life on a high level. For factors influencing the satisfaction, it has been found out that income has relationship with life satisfaction at statistical significance at 0.05. For variables on age, position, attitudes towards being single, life planning after retirement, it has been found out that single women and single female state officers anticipating to be married will have their similar life planning.

Dusadee Yairuang Sri (1998: 92-94) on the study of “Quality of service as per expectation and the relationship with satisfaction in the service of nursing care in sick monks at the Monk Hospital, Ministry of Public Health. It has been found out that the monks under treatment for 60.8% have high expectation on service quality. 63.16% have high satisfaction with treatment service. Upon relationship analysis, it has found out that factors of service receivers ie. age, years of ordination, present location, educational level before ordination, educational level in monkhood, and their monkhood status. Factors related to services include experiences in getting services, staying period in the hospital, and gender of service receiver have the relationship with satisfaction in care service at the Hospital. Upon an analysis of relationship between service quality and expectation on satisfaction in care, it has been found out that service quality as per expectation are reliability, confidence, physical facility,

attention, responses to service receivers, capability, and role awareness in operation, have the relationship with satisfaction in care service.

Boonchu Chaochiengkwan (1998: 107-109) on the study of "Satisfaction evaluation of laborers on care service by Chao Praya Yomarat Hospital, Supanburi province". It has been found out that situation in services of system, procedure, and officers in charge are all in good level. Satisfaction in the service overall is on high level. In terms of item, it has been found out that system, procedure, and officers in charge are all in high level. Upon an analysis of relationship between system, procedure, and officers in charge with satisfaction in health care has the positive relationship both overall and in each time with statistical significance at $p < 0.001$. Knowledge on service has a negative relationship with satisfaction. But experiences in service and selection of place of the laborers do not have any relationship with satisfaction in care. Upon an analysis of Multiple Regression in Stepwise, it has been found out that service procedure, system, and knowledge can predict the satisfaction in care for 22.9%.

Roonnapha Poonnatr (1999: 78-79) on the study of "Features of job and job satisfaction of professional nurses". It has been found out that the nurses in Payathai 2 Hospital possess job features in all dimensions. It covers satisfaction in job elements. Job satisfaction is on medium level. Variable with a positive relationship at statistical significance with job satisfaction as an overall, in case of individual factor, is only time service. Job feature has a positive relationship with job satisfaction in all dimensions. Personal factor does not have a positive relationship with statistical significance with overall job satisfaction. They are age, marital status, family income, numbers of dependent, and training. Predictive variables able to predict job satisfaction as an overall for professional nurse career at Payathai 2 Hospital with statistical significance are variables from job features ie. multiple skills, job reflection, and freedom in decision-making. They can explain job satisfaction for 25.99%.

Harnpon Sirachaiprapa (2000: 73-75) on the study of "Satisfaction in job of public health officer on Tambon level, Petchaburi province". It has been found out

that they are satisfied with their job on a high level. They are satisfied with job categorized by internal and external factors on a high level. Background of them have a relationship with job satisfaction ie. age, position, and educational qualification. Their previous experiences in terms of job elements have a relationship with job satisfaction. They are number of officers in Care Center, physicality of the area, distance from living place to Care Center, number of villages under responsibility, feeling towards number of villages under responsibility, community cooperation, and service time.

Yanee Nakpong (2000: 93-94) on the study of “ Satisfaction of elders on Care Center in the temple by community: case study of center at Wat Suwandaram, Ayudhaya province”. It has been found out that the satisfaction for the Center is on high level. Element of satisfaction is mostly on the procedure of service and the least is that on place. Variable influencing their satisfaction are frequency of service use, distance, comfort in transportation, at statistical significance at 0.05. It depends on the problem in elders with statistical significance at 0.01. But their satisfaction on the Center does not rely on variable such as education, income, number of children, health status, living status, time in commuting, and expense in commuting, with statistical significance at 0.05. Activities which elders use the service the most are those related to health, entertainment, exercise, etc. The least in use are income-promoted activity, sports, and physical therapy service.

CHAPTER 3

RESEARCH METHODOLOGY

In this research, the focus is to study on “Vision and Satisfaction in Pollution Prevention Toward the Economic Measures Among the Industrial Entrepreneurs in Industrial Estate of Thailand”. The research tool is questionnaire in the survey research. The research steps are as follows:

3.1 Population and the Samples

3.1.1 Target Population

Population: the population under study consists of entrepreneurs in industrial estates. They are those plants in general industry areas and export areas nationwide. The name lists are from the directory of industrial estates in Thailand, which total in 27 estates with 1,819 plants (Table 4).

Table 4 Numbers of industrial estates nationwide and numbers of plants in each estate

Industrial Estates	Numbers of plants		Total
	Export areas	General areas	
Central areas			
1. Ladkrabang Industrial Estate, Bangkok	109	84	193
2. Anyathanee Industrial Estate, Bangkok	-	31	31
3. Bangchan Industrial Estate, Bangkok	-	74	74
4. Bangpoo Industrial Estates, Samutprakarn Province	53	326	379
5. Bangplee Industrial Estates, Samutprakarn Province	-	145	145

Table 4 Numbers of industrial estates nationwide and numbers of plants in each estate (cont.)

Industrial Estates	Numbers of plants		Total
	Export areas	General areas	
6. Samutsakorn Industrial Estate, Samutsakorn Province	-	84	84
7. Rachaburi Industrial Estate, Rachaburi Province	-	1	1
8. Nong Kae Industrial Estate, Saraburi Province	-	5	5
9. Kaeng Koi Industrial Estate, Saraburi Province	-	1	1
10. Bann Wah (Hi-Tech) Industrial Estate, Ayudhaya Province	21	32	53
11. Saharatana-Nakorn Industrial Estate, Ayudhaya Province	-	47	47
12. Bang-Pa-In Industrial Estate, Ayudhaya Province	-	63	63
Total	183	893	1,076
Eastern areas			
13. Plaeng Yao (Gateway City), Chachengsao Province	6	29	35
14. Wellgrow Industrial Estate, Chachengsao Province	-	111	111
15. Laem Chabang Industrial Estate, Chonburi Province	55	48	103
16. Chonburi (Bowin) Industrial Estate, Chonburi Province	5	28	33
17. Amata-Nakorn Industrial Estate, Chonburi Province	-	172	172

Table 4 Numbers of industrial estates nationwide and numbers of plants in each estate (cont.)

Industrial Estate	Number of plants		Total
	Export areas	General areas	
18. Pinthong Industrial Estate, Chonburi Province	-	9	9
19. Mabtaput Industrial Estate, Rayong Province	-	62	62
20. Eastern Industrial Estate, Rayong Province	-	27	27
21. Pah Daeng Industrial Estate, Rayong Province	-	3	3
22. Eastern Seaboard Industrial Estate, Rayong Province	-	79	79
23. Amata City Industrial Estate, Rayong Province	-	18	18
Total	66	586	652
Northern areas			
24. Pichit Industrial Areas, Pichit Province	-	2	2
25. Northern Industrial Estate, Lumpoon Province	53	28	81
Total	53	30	83
Northeastern areas			
26. Khonkaen Industrial Estate, Khon Kaen Province	-	1	1
Total	-	1	1
Southern Province			
27. Southern Industrial Estate (Chalung), Songkhla Province	1	6	7
Total	1	6	7
Grand Total			1,819

3.1.2 Selecting the Samples

The researcher has determined the size of the sample group from industrial plants by the formula of Taro Yamane (Yamene quoted in Boontham Kitpreedaborisut, 1992: 68) with the error of 0.05 in sampling, one can get the size of the sample for 328 samples as per the following.

$$n = \frac{N}{1+Ne^2}$$

when n = size of the sample group

N = size of the population

e = sampling error

when put value into the formula

$$n = \frac{1,819}{1+1,819(0.05)^2} = 327.89$$

Therefore, the size of the sample group is 328 plants

Since the number of entrepreneurs in each estate varies, and the determined size of 328 plants is the least required. However, some of the estates have small numbers of plants, the researcher then has used all of the plants available in that estate instead of using the proportion. The final number of samples are as follows:

Formula

Number of industrial plants = $\frac{\text{Numbers of industrial plants in each estate as per area} \times 328}{\text{divided by total numbers of plants}}$

Thus, the number of samples of industrial plants nationwide are 335 plants (Table 5)

Table 5 Number of samples from the calculation as per the proportion of industrial estates

Area	Number of estates	Number of plants	Number of samples (plant unit)
Central	2	83	15
Eastern	12	1,076	194
Northern	11	652	118
Northeastern	1	1	1
Southern	1	7	7
Total	27	1,819	335

3.2 Research Instruments

In data collection, the researcher has used the questionnaire as the instrument. The questionnaire has been created after the study of information relevant to the vision and the satisfaction towards economic measures by entrepreneurs in industry in regards to pollution management. The questionnaire is divided into 5 parts:

Part 1 General status about the respondent ie age, educational level, time period in enterprising in the industry, as well as general information on industrial plants ie type of plants, time established, and environmental management of the plants.

Part 2 The part which measures the vision of the entrepreneurs in pollution protection by the plant with following criteria:

Attention to practice for 1 score

Non attention to practice for 0 score

Criteria for vision evaluation

Percentage of score

0-50

51-100

Level

Low vision

High vision

Part 3 The part which measures the satisfaction of entrepreneurs in the plant for pollution protection by 5 economy measures, they are:

- 1) Fee collection for pollution
- 2) State subsidy
- 3) Fee payment and charge for the fund
- 4) Taxation for pollution
- 5) Creation of market for license in pollution emission

This questionnaire has been adapted from Likert's scale with 5 levels ie. highly satisfied, satisfied, low satisfied, not satisfied, and do not know, with following criteria for scoring:

Highly satisfied	for	5	scores
Satisfied	for	4	scores
Low satisfied	for	3	scores
Do not know	for	2	scores
Not satisfied	for	1	score

Criteria for satisfaction evaluation

Low satisfaction	=	scores less than 50% of full scores
Medium satisfaction	=	scores between 50-80% of full scores
High satisfaction	=	scores over 81% of full scores

Part 4 The part which measures knowledge and understanding of entrepreneurs in industry in relevance to environment economic measures with following criteria:

Positive questions

Yes	for	1	score
No	for	0	score

Negative questions

Yes	for	0	score
No	for	1	score

Criteria for evaluation of knowledge and understanding level

Low knowledge	=	scores less than 50% of full score
Medium knowledge	=	scores between 51-80% of full score
High knowledge	=	scores over 81% of full score

Part 5 the part which measures the awareness of entrepreneurs in industry in relevance to pollution problem from industrial plants with following scoring criteria:

Positive questions:

Agree	for	2	scores
Not certain	for	1	score
Disagree	for	0	score

Negative questions

Agree	for	0	score
Not certain	for	1	score
Disagree	for	2	scores

Evaluation for awareness level

Low awareness	= score less than 50% of full score
Medium awareness	= score between 51-80% of full score
High awareness	= score over 81% of full score

3.3 Finding the Efficiency of Research Instruments

This research has used the questionnaire as research instrument which has been researched from documents and relevant research papers. The questionnaire has been brought to thesis advisors' attention in order to check for clearness and correctness of words and language in use. As well, this is to check for content validity. There has been a try out for the questionnaire with managers of industrial plants in the estates which are not the actual sample for 30 respondents. Afterwards, there has been an adjustment on the questionnaire in order to gain appropriateness and coverage for the content as advised. The data from the questionnaire has then been analysed for difficulty, discrimination power, and reliability to obtain the quality prior to actual use in the field research. The finding out of efficiency in the tool is as follows:

The efficiency of knowledge test Take the tested questionnaire for check, with the right answer for 1 score and wrong answer for 0 score. Totalling each respondent's score and prioritize them from the highest to the lowest for 25% in the high group and low group. Then, there is an analysis for difficulty, discrimination

power, and reliability for the whole questionnaire (Boontham Kitpreedaborisut, 1988: 156-172) with following formula:

$$\text{Difficulty (p)} = \frac{PH + PL}{2n}$$

$$\text{Discrimination power (r)} = \frac{PH - PL}{2n}$$

When PH = number of the respondents with right answer in high group

PL = number of the respondents with right answer in low group

n = number of total respondents in high and low group

For the selected questions in data collection, there is an index for difficulty between 0.2-0.8 and with discrimination power from 0.2 up. When getting the questions with difficulty and discrimination power with appropriateness, there is then the reliability test for the whole questionnaire which is internal consistency with Kuder Richardson formula KR-20 as follows:

$$(r_{tt}) = \frac{k}{k-1} \left(\frac{S_x^2 \sum pq}{S_x^2} \right)$$

When k = number of items in the questionnaire

S_x^2 = variance of total scores

p = proportion of respondents with right answer

q = (1-p) proportion of the respondents with wrong answer

The reliability should be over 0.7 for actual use (Boontham Kitpreedaborisut, 2531: 17).

The efficiency for satisfaction survey: take the tested questionnaire and prioritize the scores from high to low for 25 % in high group and 25% in low group. The each group for item analysis by test for difference in average score between high and low group by t-test as follows:

$$t = \frac{\bar{X}_{\max} - \bar{X}_{\min}}{\sqrt{\frac{S_{\max}^2}{n_{\max}} + \frac{S_{\min}^2}{n_{\min}}}}$$

When	t	means	discrimination power
	\bar{X}_{\max}	means	average score of maximum score group
	\bar{X}_{\min}	means	average score of minimal score group
	S^2_{\max}	means	standard deviation of maximum score group
	S^2_{\min}	means	standard deviation of minimal score group
	n	means	person in group

From the calculation of questionnaire, the selected item for actual use is t value over 1.75. For those below 1.75, the researcher has re-adjusted the items as per the suggestion of thesis advisers. T-test formula in use (Puangrat Taweerat, 1997: 131-132) after the quality check, there has been the selection for those with appropriate discrimination power. Then, there is a test for reliability of the whole questionnaire with Cronbach's Coefficient Alpha (Puangrat Taweerat, 1997: 125) which is reliability test for internal consistency as the method of Kuder Richardson. However, this formula can find the reliability of the tool with scoring 1-0. The evaluation score is 1,2,3,4, and 5 as follows:

$$\alpha = \frac{n}{n-1} \left\{ \frac{1 - \sum S^2_I}{S^2_t} \right\}$$

When	α	=	Coefficient of reliability
	n	=	means number of items
	S^2_I	=	means variance of each item
	S^2_t	=	means total scores of variance

Reliability criteria is over 0.7 which is considered the usable criteria In conclusion, the efficiency test for reliability analysis is as follows:

Knowledge part, reliability value is .7042

Satisfaction part, reliability value is .9566

Awareness part, reliability value is .7238

3.4 Data Collection

The researcher has collected data during the month of February-March 2004 via postage mail questionnaire to the managers of industrial plants in nationwide industrial estates. This is 2 times of the designated samples. Attachment is the official letter for cooperation in replying the questionnaire. The respondents have been requested to return the questionnaire to the researcher by postage mail. The address of the researcher has been shown on the returned envelope with stamp.

3.4 Statistics for Data Analysis

After data collection, the researcher has checked for the completeness and correctness of the questionnaire, prior to running the result by computer with SPSS program.

Descriptive Statistics: is the sorting of data in groups for general information of the respondents and the summary of features of independent and dependent variables. There has been an analysis for frequency distribution, percentages, average, and standard deviation.

Inferential Statistics: the use of Multiple Regression Analysis, in an analysis of result and the prioritization of independent variables influencing the dependent ones by designating the in and out of independent variables via Stepwise.

CHAPTER 4

RESULTS

The study on “Vision and Satisfaction in Pollution Prevention Toward the Economic Measures Among the Industrial Entrepreneurs in Industrial Estate of Thailand” had presented the research result as follows:

- General Characteristics of the Samples
- Management in Environment by Industrial Plants
- Vision in Environmental Pollution Prevention
- Knowledge and Understanding of Entrepreneurs Towards Economic Measures
- Awareness of Entrepreneurs on Pollution Problem by Industrial Plants
- Satisfaction on Economic Measure in Pollution Prevention by Industrial Plants
- Factors Related to the satisfaction with economic measure
- Factors Related to vision in pollution prevention of industrial plants

4.1 General Characteristics of the Samples

The samples were those entrepreneurs in industrial plants for 287 plants. More than half were female (51.2%), aged between 30-39 years old the most (41.8%). Most had been graduated in the Bachelor’s degree (76.7%), followed with higher than Bachelor’s degree (14.3%). There were 9.1% lower than Bachelor’s degree. Types of industry were in automobile (35.9%), electronics (25.4%), and metal industry (16%) respectively. Most of them had their business conduct for 6-10 years the most (30%) (Table 6).

Table 6 Number and percentage of the samples categorized by general information

General Information of the Sample Groups	Number	Percentage
1. Gender		
Male	140	48.8
Female	147	51.2
2. Age		
20-29 years old	106	37.0
30-39 years old	120	41.8
40-49 years old	50	17.4
Over 50 years old	11	3.8
4. Educational level		
Lower than Bachelor's degree	26	9.0
Bachelor's degree	220	76.7
Higher than Bachelor's degree	41	14.3
5. Industry type		
Electronic Industry	73	25.4
Automobile Industry	103	35.9
Chemical Industry	16	5.6
Metal Industry	46	16.0
Modified Food	17	5.9
Clothing/Leatherware	18	6.3
Ornament	14	4.9
6. Time period for business conduct		
0-5 years old	81	28.2
6-10 years old	86	30.0
11-15 years old	67	23.3
16-20 years old	28	9.8
Over 21 years old	25	8.7
Mean = 10.65	Standard Deviation = 7.61	

4.2 Management in Environmental by Industrial Plants

Most of the samples were industrial plants which were not in the group to write-up EIA report (83.9%). Most of the waste from production line was solid waste (74.9%) which had never been a complaint in regards to pollution problem (91.3%). They do not enter into standard of environmental management system ISO 14001 (68.6%). There were also no officer supervising environmental management system (50.7%). Overall, environmental management by industrial plants mostly had their management for environment within their premise (84.3%) (Table 7).

Table 7 Number and percentage of the sample group categorized by data in environmental management by industrial plants

General Information of the Sample Groups	Number	Percentage
1. EIA report write-up		
Yes	46	16.1
No	241	83.9
2. Waste from production line		
Waste water	150	52.3
Air pollution	83	28.9
Solid waste	215	74.9
Hazardous waste	133	46.3
None	47	16.4
(can reply more than 1 answer)		
3. Complaints in regards to pollution problem		
Yes	25	8.7
No	262	91.3
4. Entering into standard of environmental management ISO 14001		
Yes	90	31.4
No	197	68.6

Table 7 Number and percentage of the sample group categorized by data in environmental management by industrial plants (cont.)

General Information of the Sample Groups	Number	Percentage
5. Officers in charge to supervise environmental management		
Yes	143	49.3
No	144	50.7
6. Overall environmental management by industrial plants		
Yes	242	84.3
No	45	15.7

4.2.1 Waste Water Management of Industrial Plants

Water sources for production line mostly was water supply (66.9%). There was central waste water treatment system in the estate as the source to maintain waste water from production line (82.2%). There was no own waste water treatment system in any plant (56.8%). Those with their own system (43.2%) had waste water management after treatment. They also use central waste water treatment system in the estate (38%). Management of residue after treatment had been mostly done by private sector or state unit for elimination (86.3%). Most of the problem in waste water treatment control was high cost of the maintenance (Table 8).

4.2.2 Air Pollution Management of Industrial Plants

Energy sources used in industrial plants mostly were from electricity (48.1%) as it was used the most in production line in heating process (46%). There were emission of dust/smoke the most (10.5%). Most of the industrial plants do not had air pollution treatment system (62.4%). Most of them emit air pollution as per legally required (66.6%). Most of the problem from the use of fuel in production line was an impact on health (63%) (Table 9).

Table 8 Number and percentage of the sample group categorized by data in waste water management environment of the industrial plants

General Information of the Sample Groups	Number	Percentage
1. Water sources for production line		
Underground water	43	15.0
Water supply	192	66.9
Other water resources	52	18.1
2. Sources to maintain waste water from production line		
River/klong	3	1.0
Central waste water treatment system of the estate	236	82.2
Public drainage	20	7.0
Other water resources	28	9.8
3. Waste water treatment system of the industrial plants		
- Yes	124	43.2
3.1 Management of waste water after treatment	44	35.4
Drain into public drainage	6	5.0
Outflow to public water resources	4	3.2
Down on the ground	32	25.8
Recycling	38	30.6
Others	107	86.3
3.2 Use the residue from waste water treatment by hiring private sector or state unit to eliminate or use it usefully ie use as fertilizer	17	13.7
- None	163	56.8
4. Problem in control for waste water treatment system		
Annoying smell	24	19.3
High expense in maintenance	153	123.3
Lack of capable officers	75	60.4
(can reply more than 1 answer)		

Table 9 Number and percentage of the sample group categorized by data in environmental management in air pollution of industrial plants

General Information of the Sample Groups	Number	Percentage
1. Energy source in the industrial plants		
Fuel	129	44.9
Electricity	138	48.1
Natural gas	20	7.0
2. Steps in fuel use in production line		
Raw material boiling	34	11.8
Raw material oven	71	24.7
Raw material mix	22	7.7
Heating	195	67.9
(can reply more than 1 answer)		
3. Air pollution emission of industrial plants		
Sulphurdioxide	12	4.2
Nitricoxide or nitrogenoxide gas	10	3.5
Carbonmonoxide or carbondioxide	22	7.7
Dust/smoke	30	10.5
Vapour of chemical/ fuel vapour/ organic vapour	25	8.7
Others	17	5.9
(can reply more than 1 answer)		
4. Air pollution treatment system in industrial plants		
Yes	84	29.3
No	179	62.4
5. Air pollution emission is as per legal standard		
As per the standard	191	66.6
Not according to the standard	3	1.0
Not answer	93	32.4

Table 9 Number and percentage of the sample group categorized by data in environmental management in air pollution of industrial plants (cont.)

General Information of the Sample Groups	Number	Percentage
6. Problem in fuel use in production line		
High price	75	26.1
Shortage	87	30.3
Impact on health	181	63.0
(can reply more than 1 answer)		

4.2.3 Solid Waste Management of Industrial Plants

Solid waste from production line were mostly paper (77%) and non-recycling (58.9%). Hire for private sector/state units to eliminate (86.4%). Most of the problem in solid waste disposal was high cost (79.4%) (Table 10).

Table 10 Number and percentage of the sample categorized in data of environmental management on solid waste of industrial plants

General Information of the Sample Groups	Number	Percentage
1. Solid waste from production line		
Paper	221	77.0
Plastic	180	62.7
Rubber/leather	57	19.9
Cloth, fiber	79	27.5
Glass, ceramic	39	13.6
Metal	135	47.0
Others	47	16.4
(can reply more than 1 answer)		
2. Solid waste recycling		
Recycling	118	41.1
No Recycling	169	58.9

Table 10 Number and percentage of the sample categorized in data of environmental management on solid waste of industrial plants (cont.)

General Information of the Sample Groups	Number	Percentage
3. Solid waste disposal in industrial plant		
Hire private sector or state units to eliminate	248	86.4
Use in other activities ie fertilizer	39	13.6
4. Problem in solid waste disposal		
High expense	228	79.4
Lack of capable officers	109	38.0
Resistance from villages nearby the source of disposal	68	23.7
(can reply more than 1 answer)		

4.2.4 Management on Hazardous Waste by Industrial Plants

Hazardous waste by industrial plants from production line mostly were those containers for chemical substances (49.5%) and no recycling (90.6%). For hiring of private sector or state unit to eliminate (63.8%). Most of the problem was high cost (79.4%) (Table 11).

Table 11 Number and percentage of the sample categorized in data on environmental management on hazardous waste in industrial plant

General Information of the Sample Groups	Number	Percentage
1. Hazardous waste from production line		
Deteriorated or expired chemicals	89	31.0
Chemical container	142	49.5
Oil or oil grease	130	45.3
Residue sediment or inorganic solid stuff	68	23.7
Residue sediment in heavy metal	50	17.4
Others	71	24.7
(can reply more than 1 answer)		

Table 11 Number and percentage of the sample categorized in data on environmental management on hazardous waste in industrial plant (cont.)

General information of the sample groups	Number	Percentage
2. Recycling of hazardous waste		
Yes	27	9.4
No	260	90.6
3. Industrial hazardous waste disposal		
No elimination	104	36.2
Hire private sector or state unit to eliminate	183	63.8
4. Problem in hazardous waste disposal		
High expense to disposal	229	79.8
Lack of capable officers	105	36.6
Resistance from villagers nearby the disposal place	76	26.5
(can reply more than 1 answer)		

4.3 Vision in Environmental Pollution Prevention

Measuring of vision of entrepreneurs in industrial plants in this study, the researcher had measured the vision level by having the respondents reply on their intention for pollution prevention in industrial plants. It has found out that most of the entrepreneurs were attentive to pollution prevention with their policy announcement on environment and in written (64.5%). There were steps in workflow for production-line with explanation (87.5%), that in units, as well as set-up of instruments and equipment (84%). There were also prevention plan and preparation as well as emergency plan which focuses on the prevention of slippery and waste emission in case an accident (76.3%), training for an alertness in personnel for reduction of waster and efficiency in energy use and impact (76.3%). There was an arrangement for evaluation on maintenance of the plant in term of efficiency (70.4%) and an appointment of the responsables in environmental management in plant structure (64.1%). There was also a consideration for expense in waste treatment and waste

elimination as production cost per unit (70.4%). There was a follow-up of pollution emission to environment in all types as legally required (77.7%). Upon having the result on environmental management, there was an adjustment and change for the better always (83.6%) (Table 12).

Table 12 Number and percentage of the sample group categorized in item on vision in intention for pollution prevention by industrial plants

Item	Yes	No
	Percentage	Percentage
1. Announcement on environment policy in written	185 (64.5)	102 (35.5)
2. Step on workflow for production line with explanation	251 (87.5)	36 (12.5)
3. Step on workflow for units and plan to set up tools and equipment	241 (84.0)	46 (16.0)
4. Plan for prevention and preparation as well as emergency plan with a focus on prevention of slippery and waste emission in case of an accident	219 (76.3)	68 (23.7)
5. Training for personnel to be alert on benefit from reduction of waste and efficiency in the use of energy and the impact	219 (76.3)	68 (23.7)
6. Arrange for an evaluation on supervision of plants whether there is an efficiency	202 (70.4)	85 (29.6)
7. Organizational structure of your plant has appointed the responsables for environmental management	184 (64.1)	103 (35.9)
8. Consideration on the expenses of treatment and disposal of waste as cost of production per unit	202 (70.4)	85 (29.6)
9. Arrange for follow-up of pollution emitted to environment for all types as legally required	223 (77.7)	64 (22.3)

Table 12 Number and percentage of the sample group categorized in item on vision in intention for pollution prevention by industrial plants. (Cont.)

Item	Yes	No
	Percentage	Percentage
10. Upon knowing the result of environmental management in your plant, you have improved and changed for the better always	240 (83.6)	47 (16.4)

Table 13 Number and percentage of the sample categorized in item on vision in pollution prevention by industrial plants

Enterprise in industrial plants	Numbers (n = 287)	Percentage
Have vision (51-100%)	224	78.0
No vision (0-50%)	63	22.0
Mean = 7.55		Standard Deviation = 2.87

4.4 Knowledge and Understanding of Entrepreneurs Toward Economic Measure

The study of knowledge and understanding of entrepreneurs on economic measure in pollution prevention in industrial plants had found out that most of the entrepreneurs had medium knowledge and understanding (68.6%) (Table 14).

Table 14 Number and percentage of the sample categorized in item on knowledge and understanding on economic measure in pollution prevention by industrial plants

Item	correct	incorrect
1. Economic tool is an incentive for waste source in production line and in consumption in order to have investment or good behavior on environment	205 (71.4)	82 (28.6)
2. Economic tools are tools for income earner to the state in order to spend on other activities	174 (60.6)	113 (39.4)

Table 14 Number and percentage of the sample categorized in item on knowledge and understanding on economic measure in pollution prevention by industrial plants (cont.)

Item	correct	incorrect
3. The choice of economic instrument is not needed to be accepted by the society	42 (14.6)	245 (85.4)
4. Charge on treatment or disposal of waste is not directly related to the consideration on environmental damage	74 (25.8)	213 (74.2)
5. Charge on pollution emission are in 3 patterns: 1. user charges 2. effluent charges 3. fine	126 (43.9)	161 (56.1)
6. Different taxation determination between old and new battery is a tool in economic measure	209 (72.8)	78 (27.2)
7. Fee for hazardous waste is the fee for transportation, treatment, or disposal, as well as bury of industrial waste from the Center at Samae Dam, Bang Khun Tien , under Department of Industrial Plant is a measure on fee for environmental management	167 (58.2)	120 (41.8)
8. Charge on environmental management will be equal in all cases, regardless of size of land, amount or type of different pollution	59 (20.5)	228 (79.5)
9. Deposit-return is for those products with potential as polluters, return will be yielded when give back after use ie bottle deposit	172 (59.9)	115 (40.1)
10. Deposit-return is the concept to protect pollution from the start til the end of product life cycle (life cycle approach)	180 (62.7)	107 (37.3)

Table 14 Number and percentage of the sample categorized in item on knowledge and understanding on economic measure in pollution prevention by industrial plants (cont.)

Item	correct	incorrect
11. Advantage of deposit-return is to rotate the fund for research and development for clean technology in waste treatment	178 (62.1)	109 (37.9)
12. Tradable pollution permit has the concept of control on amount of pollution emission on an acceptable level	146 (50.9)	141 (49.1)
13. Tradable pollution permit for pollution emission must use cost operation in pollution treatment on a high level	145 (50.5)	142 (49.5)
14. Tradable pollution permit for pollution emission is the system which impact the environment less than charge or fee for pollution permit	108 (37.6)	179 (62.4)
15. Subsidy by the state is for those entrepreneurs who have the need to install machines to eliminate pollution from production technique change which as to be clean and must be able to reduce waste emission without any evidence or index for proof	127 (44.2)	160 (55.8)

Table 15 Number and percentage of the sample categorized in item on knowledge and understanding on economic measures in pollution prevention by industrial plants

Entrepreneurs in industrial plants	Numbers (n = 287)	Percentage
High knowledge and understanding (81-100)	29	10.1
Medium knowledge and understanding (51-80%)	197	68.6
Low knowledge and understanding (0-50%)	61	21.3
Mean = 9.17	Standard Deviation = 2.88	

4.5 An Awareness of Entrepreneurs on Pollution Problem from Industrial Plants

From the study on awareness of entrepreneurs on pollution problem from industrial plants had found out that they were mostly aware on overall basis on high level (57.1) (Table 16).

Table 16 Number and percentage of the sample categorized in item on awareness on pollution problem from industrial plants

Item	Agree	Not certain	Disagree
1. Waste water management in industrial plants should not segregate waste part for treatment near the original source	56 (19.5)	93 (32.4)	138 (48.1)
2. Waste water from industrial plants are not those from production line and do not need any treatment prior to flowing to the environment	39 (13.6)	38 (13.2)	210 (73.1)
3. Waste water from industrial plants going through treatment should be used for other activity in the plants ie watering or floor cleaning.	242 (84.3)	23 (8.0)	22 (7.6)
4. Planting the trees around the plant does not help treating air pollution	28 (9.8)	39 (13.6)	220 (76.6)
5. Use of stack in industrial plants for air emission should not higher than 2.5 times of the building height at the nearest neighborhood	97 (33.8)	167 (58.2)	20 (6.9)
6. Reduction of amount of hazardous waste from source or use clean technology as the best hazardous waste management	205 (71.4)	57 (19.9)	25 (8.7)
7. Elimination of disposal of incorrect waste residue which might danger environment	258 (89.9)	9 (3.1)	20 (7.0)

Table 16 Number and percentage of the sample categorized in item on awareness on pollution problem from industrial plants (Cont.)

Item	Agree	Not certain	Disagree
8. Open dumping of hazardous waste or open burning as the correct elimination	12 (4.2)	38 (13.2)	237 (82.5)
9. Segregate hazardous waste separately, especially those which might have interaction when being collective	258 (89.9)	12 (4.2)	17 (5.9)
10. Having in place leakage system with base or container serving the split of toxic waste	262 (91.3)	9 (3.1)	16 (5.5)

Table 17 Number and percentage of the sample categorized in each item on an awareness of pollution problem from industrial plants

Factors	Numbers (n = 287)	Percentage
High awareness (81-100%)	164	57.1
Medium awareness (51-80%)	123	42.9
Low awareness (0-50%)	0	0.0
Mean = 10.86		Standard Deviation = 2.56

4.6 Satisfaction on Economic Measures in Pollution Prevention by Industrial Plants

4.6.1 Satisfaction on Economic Measures in Pollution Prevention by Industrial Plants in Water Pollution

The satisfaction on this aspect had found out that the said entrepreneurs were satisfied on medium level on economic measure for charge (65.5%), for fee (60.6%), for taxation (42.5%), and for deposit-return (50.2%). The highest satisfaction was on subsidy (54.4%) (Table 18).

Table 18 Number and percentage of the sample categorized in item on economic measure in waste water management

Economic Measure in Waste Water Management	Satisfaction Level				
	Not satisfied	Low satisfied	Satisfied	highly satisfied	Do not know
1. Arrange for charge ie. charge for waste water and its treatment	6 (2.1)	25 (8.7)	188 (65.5)	53 (18.5)	15 (5.2)
2. Arrange for fee ie. fee for waste water and area allocated for waste water source	9 (3.1)	47 (16.4)	174 (60.6)	29 (10.1)	28 (9.7)
3. Taxation on water pollution	17 (5.9)	50 (17.4)	122 (42.5)	66 (23.0)	32 (11.1)
4. Arrange for deposit-refund system on water pollution management	17 (5.9)	33 (11.5)	144 (50.2)	56 (19.5)	37 (12.9)
5. Arrange for subsidy ie. for those with need to install machines for water pollution treatment	3 (1.0)	16 (5.6)	82 (28.6)	155 (54.4)	31 (10.8)
Mean = 19.11		Standard Deviation = 3.82			

4.6.2 Satisfaction on Economic Measures in Pollution Prevention by Industrial Plants in Air Pollution

From the study, it had been found out that the said entrepreneurs were satisfied on medium level in term of charge (50.5%), fee (48.8%), and deposit-return (37.6%). The highest level of satisfaction was on different taxation (42.5%) and on subsidy (54.4%) (Table 19).

Table 19 Number and percentage of the sample categorized by item on economic measure in air pollution management

Economic Measure in Air Pollution Management	Satisfaction Level				
	Not satisfied	Low satisfied	Satisfied	highly satisfied	Do not know
1. Arrange for charge on air pollution ie. on sulphurdioxide, nitrogendioxide, carbonmonoxide, etc.	3 (1.0)	23 (8.0)	145 (50.5)	74 (25.8)	42 (14.6)
2. Arrange for fee in pollution management ie. fee for amount of used fuel	11 (3.8)	36 (12.5)	140 (48.8)	69 (24.0)	31 (10.8)
3. Arrange for set-up of different taxation ie. reduce tax for unleaded gas so as to differ from leaded one	3 (1.0)	34 (11.8)	97 (33.8)	122 (42.5)	31 (10.8)
4. Set-up deposit-refund system on air pollution management	13 (4.5)	41 (14.3)	108 (37.6)	68 (23.7)	57 (19.9)
5. Arrange for subsidy ie. subsidy for the entrepreneurs who have a need to install machine for air pollution treatment	6 (2.1)	13 (4.5)	75 (26.1)	156 (54.4)	37 (12.9)
Mean = 19.44		Standard Deviation = 4.52			

4.6.3 Satisfaction on Economic Measure in Pollution Prevention by Industrial Plants in Solid Waste Management

From the study, it had been found out that the entrepreneurs were satisfied on medium level on economic measure in term of charge (59.6%), fee (51.2%), deposit-refund (47%). The highest satisfaction was subsidy (46.7%) (Table 20).

Table 20 Number and percentage of the sample categorized by item on economic measure in solid waste management

Economic Measure in Solid Waste Management	Satisfaction Level				
	Not satisfied	Low satisfied	Satisfied	highly satisfied	Do not know
1. Arrange for charge for solid waste throw-away	0 (0.0)	41 (14.3)	171 (59.6)	57 (19.9)	18 (6.3)
2. Fee Arrange for fee ie. fee for amount of collected solid waste and actual expenses	6 (2.1)	24 (8.4)	147 (51.2)	85 (29.6)	25 (8.7)
3. Arrange for price set-up of raw materials and taxation ie tax on raw materials or products by taking into consideration the recycling, environmental impact, management fee for waste of residue throughout its life cycle or collect tax as per the type of container	0 (0.0)	34 (11.8)	150 (52.3)	78 (27.2)	25 (8.7)

Table 20 Number and percentage of the sample categorized by item on economic measure in solid waste management (cont.)

Economic Measure in Solid Waste Management	Satisfaction Level				
	Not satisfied	Low satisfied	Satisfied	highly satisfied	Do not know
4. Arrange for deposit-refund system ie. issue measure for deposit and refund for bottles, containers, or products for recycling	11 (3.8)	32 (11.1)	135 (47.0)	75 (26.1)	34 (11.9)
5. Arrange for subsidy ie. subsidy in solid waste disposal or technology to reduce solid waste	4 (1.4)	23 (8.0)	95 (33.1)	134 (46.7)	31 (10.8)
Mean = 19.81		Standard Deviation = 3.83			

4.6.4 Satisfaction on Economic Measure in Pollution Prevention by Industrial Plants in Management of Hazardous Waste

From the study, it had been found out that the entrepreneurs were satisfied on medium level on measure of charge (43.9%), on fee (44.3%), on deposit-return (43.9%). The highest satisfaction was subsidy (49.8%) (Table 21).

Table 21 Number and percentage of the sample group categorized by item on economic measure in management of hazardous waste

Economic measure in management of hazardous waste	Satisfaction Level				
	Not satisfied	Low satisfied	Satisfied	highly satisfied	Do not know
1. Arrangement for charges ie. collect charges from polluters of hazardous waste contamination	3 (1.0)	16 (5.6)	126 (43.9)	117 (40.8)	25 (8.7)
2. Arrangement for fee ie. fee for amount of hazardous waste collected and actual expenses	0 (0.0)	27 (9.4)	127 (44.3)	108 (37.6)	25 (8.7)
3. Arrange for taxation ie. tax on production in ratio of unit per weight of hazardous waste under treatment or tax deductible	8 (2.8)	29 (10.1)	129 (44.9)	92 (32.1)	29 (10.1)
4. Arrange for deposit-refund system ie. measure for deposit and refund for containers and products of hazardous waste	7 (2.4)	42 (14.6)	126 (43.9)	78 (27.2)	34 (11.8)
5. Arrange for subsidy	4 (1.4)	13 (4.5)	99 (34.5)	143 (49.8)	28 (9.7)
Mean = 20.22		Standard Deviation = 4.08			

Table 22 Number and percentage of entrepreneurs in industrial plants categorized by level of satisfaction on an overall basis on economic measure in pollution prevention

Entrepreneurs in industrial plants	Numbers (n = 287)	Percentages
Highly satisfied (81-100%)	148	51.6
Mediumly satisfied (51-80%)	114	39.7
Lowly satisfied (0-50%)	25	8.7
Mean = 78.58		Standard Deviation = 14.84

4.7 Factors Related to the Satisfaction with Economic Measure

From an objective of research on finding out the relationship with the said satisfaction and the said vision, there were some analysis process and result of Multiple Regression Analysis as follows:

4.7.1 Characteristics of Independent Variables and Dependent Variables

There were an interval scale with details as follows:

Y1 = Satisfaction score on economic measure in pollution prevention by industrial plants

X1 = Vision score on pollution prevention in industrial plants

X2 = Awareness score of entrepreneurs in industrial plants on pollution problem

X3 = Time period of business conduct of industrial plants

X4 = Knowledge and understanding scores of entrepreneurs on economic measure

Source selected independent variables of the sample group were measures scale had created dummy variables as follows:

X5 = Complaints, yes = 1 score , no = 0 score

X6 = Industrial plants have to arrange for EIA report, yes = 1 score, and no = 0 score

X7 = Having environmental management in industrial plant, yes = 1 score,
and no = 0 score

X8 = Having officers in charge to supervise environmental management
system, yes = 1 score, no = 0 score

4.7.2 Relationship Between Independent Variables

From the initial agreement of Multiple Regression Analysis, there was a low need for initial variables having relationship to each other, in order to gain relationship value correctly. Thus, upon an analysis, it needs to have auto-correlation check. From the check on coefficient value of Pearson, it had been found out that 5 independent variables had relationship among themselves on low up to medium level. Three of independent variables had relationship among themselves on a high level. Thus, these 3 variables were not selected, as r is over 0.70 (Suchart Prasitratasinth, 1994: 84). Therefore, these 5 variables were appropriate for further Multiple Regression Analysis (Table 23).

The result of analysis on factors having relationship with satisfaction in economic measure in pollution prevention has found out that 2 independent variables out of 5 had the relationship with satisfaction on economic measure in pollution prevention at statistical significance at 0.05. They were vision of entrepreneurs in pollution prevention of industrial plants (X_1) and knowledge and understanding of entrepreneurs on economic measure (X_4). These 2 variables can explain the satisfaction on economic measure in pollution prevention at 6.40% ($R^2 = 0.064$).

Table 23 Relationship between independent and dependent variables

	X1	X2	X3	X4	X5	X6	X7	X8	Y1
X1	1.000								
X2	-.057	1.000							
X3	-.090	.120*	1.000						
X4	.070	.376**	.010	1.000					
X5	.013	-.338**	-.087	-.072	1.000				
X6	.048	-.006	-.059	-.003	-.016	1.000			
X7	.467**	-.370**	-.193**	-.016	.894**	.003	1.000		
X8	.368**	-.347**	-.186**	.088	.851**	.005	.879**	1.000	
Y1	.016	.348**	.158**	.122*	-.128*	-.032	-.179**	-.146*	1.000
X	7.82	11.86	4.81	6.90	.18	2.05	.94	.59	56.74
S.D.	2.53	3.10	4.17	3.30	.95	1.25	.90	1.00	18.88

P<0.01** , P<0.05*

The multiple regression analysis equation which explain the satisfaction on economic measure in pollution prevention is as follows:

$$Y = -b1X_1 + b2X_4$$

When Y = Prediction on satisfaction on economic measure in industrial plants

a = Constant Value = 67.558

b1 = Coefficient regression of visions of entrepreneurs in pollution prevention in industrial plants

b2 = Coefficient regression of knowledge and understanding of entrepreneurs on economic measure

X₁= Visions of entrepreneurs in pollution prevention in industrial plants

X₄= Knowledge and understanding of entrepreneurs on economic measure

$$Y = 67.558 - .829X_1 + .584X_4$$

From Multiple Regression Analysis in Stepwise of the sample group, it has found out that variables able to predict the satisfaction on economic measure in pollution prevention best was their knowledge and understanding of entrepreneurs in economic measure, followed with vision of entrepreneurs in pollution prevention in industrial plants. These 2 variables can explain the satisfaction on economic measure in pollution prevention for 6.40% with statistical significance at 0.05 (Table 24).

Table 24 Result of Multiple Regression Analysis of factors having relationship with the satisfaction of entrepreneurs in industrial plants on economic measures

Independent Variables	B	Beta	t-value	Signif.
• Vision of entrepreneurs in pollution prevention in industrial plants (X ₁)	-.829	-.147	-2.013	.045
• Knowledge and understanding of entrepreneurs on economic measure (X ₄)	.584	.134	2.006	.046
N = 287		S.E. = 13.92		
R = .253		F = 2.199		
R ² = .064		Sig. = .028		

4.8 Factors Related to Vision on Pollution Prevention of Industrial Plants

From an objective of research on finding out the relationship with the said satisfaction and the said vision, there were some analysis process and result of Multiple Regression Analysis as follows:

4.8.1 Characteristics of Independent Variables and Dependent Variables

There were an interval scale with details as follows:

Y₂ = Vision score on pollution prevention in industrial plants

X₁ = Satisfaction score on economic measure in pollution prevention by industrial plants

X₂ = Awareness score of entrepreneurs in industrial plants on pollution problem

X₃ = Time period of business conduct of industrial plants

X₄ = Knowledge and understanding scores of entrepreneurs on economic measure

Some selected independent variables were measured dummy scales as follows:

X5 = Complaints, yes = 1 score , no = 0 score

X6 = Industrial plants have to arrange for EIA report, yes = 1 score, and no = 0 score

X7 = Having environmental management in industrial plant, yes = 1 score, and no = 0 score

X8 = Having officers in charge to supervise environmental management system, yes = 1 score, no = 0 score

4.8.2 Relationship Between Independent Variables

As from the initial agreement of Multi Regression Analysis, there were a low need for initial variables having relationship to each other, in order to gain relationship value correctly. Thus, upon an analysis, it needs to had internal relationship check. From the check on coefficient value of Pearson, it had been found out that 5 independent variables had relationship among themselves on low up to medium level. Three of independent variables had relationship among themselves on a high level. Thus, these 3 variables were not selected, as r is over 0.70 (Suchart Prasitratasin, 1994: 84). Therefore, these 6 variables were appropriate for further Multiple Regression Analysis (Table 25).

Table 25 Relationship between independent and dependent variables

	X1	X2	X3	X4	X5	X6	X7	X8	Y2
X1	1.000								
X2	.348**	1.000							
X3	.158**	.120*	1.000						
X4	.122*	.376**	.010	1.000					
X5	-.128*	-.338**	-.087	-.072	1.000				
X6	-.032	-.006	-.059	-.003	-.016	1.000			
X7	-.179**	-.370**	-.193**	-.016	.894**	.003	1.000		
X8	-.146*	-.347**	-.186**	.088	.851**	.005	.879**	1.000	
Y2	.016	.348**	.158**	.122*	-.128*	-.032	-.179**	-.146*	1.000
X	56.74	11.86	4.81	6.90	.18	2.05	.94	.59	7.82
S.D.	18.88	3.10	4.17	3.30	.95	1.25	.90	1.00	2.53

P<0.01**, P<0.05*

An analysis result having relationship with vision of entrepreneurs in pollution prevention had found out that 2 independent variables out of 5 having relationship with the said vision at statistical significance at 0.05 are their satisfaction (X_1) and time period of business conduct (X_3), the two of which can explain the satisfaction on economic measures for 32.70% ($R^2 = 0.327$).

The best regression which explains the vision of entrepreneurs in industrial plants in pollution prevention are:

$$Y = a - b_1X_1 + b_2X_3$$

When Y = Prediction value of industrial entrepreneurs in pollution prevention

a = Constant Value = 6.390

b_1 = Regression Coefficient of satisfaction on economic measure in pollution prevention in industrial plants

b_2 = Regression Coefficient of time period of business conduct of the industrial plant

X_1 = Satisfaction on economic measure in pollution prevention in industrial plants

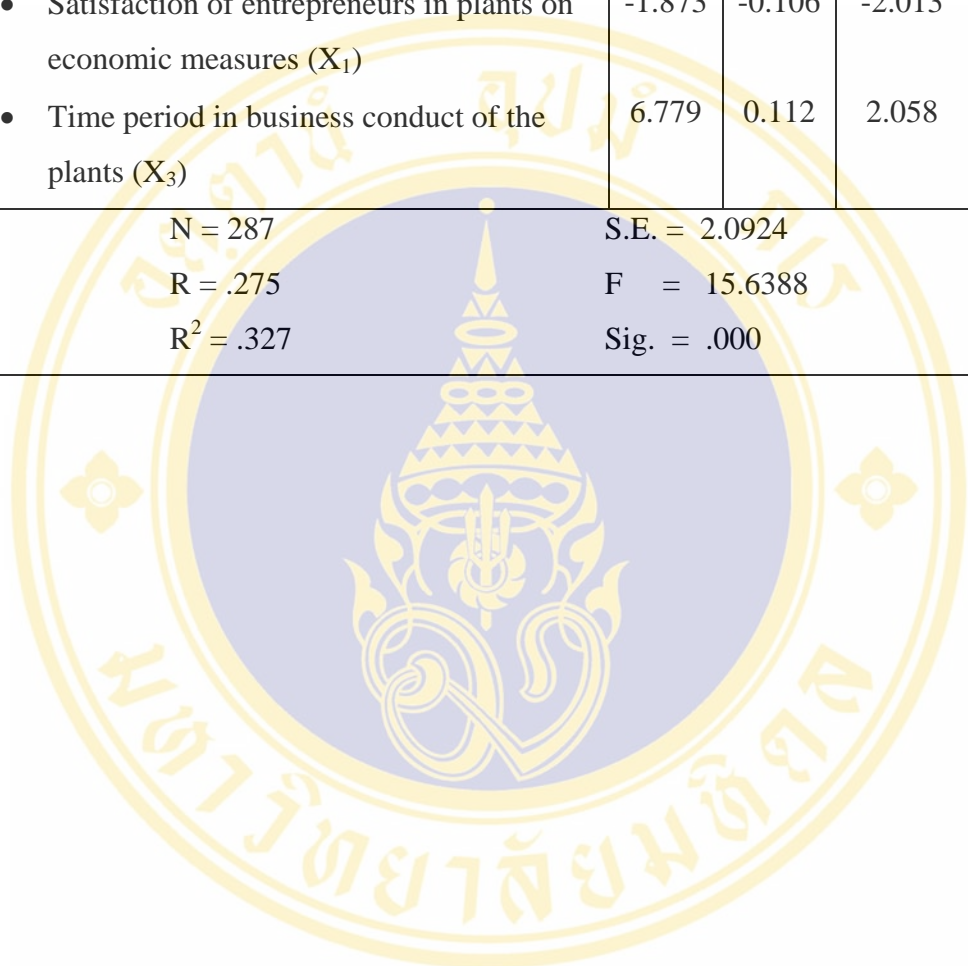
X_3 = Time period of business conduct of the industrial plant

$$Y = 6.390 - 1.873X_1 + 6.779X_3$$

From the Multiple Regression Analysis in Stepwise in the sample group, it had found out that variables able to predict the vision of the entrepreneurs in pollution prevention best was time period of business conduct, followed with their satisfaction on economic measures, respectively. These 2 factors can explain the vision for 32.70% with statistical significance at 0.05 (Table 26).

Table 26 Analysis result on Multiple Regression of factors having relationship with vision of entrepreneurs in pollution prevention in industrial plants

Independent Variables	B	Beta	t-value	Signif.
• Satisfaction of entrepreneurs in plants on economic measures (X ₁)	-1.873	-0.106	-2.013	0.045
• Time period in business conduct of the plants (X ₃)	6.779	0.112	2.058	0.041
N = 287		S.E. = 2.0924		
R = .275		F = 15.6388		
R ² = .327		Sig. = .000		



CHAPTER 5

DISCUSSION

The research on “Vision and Satisfaction in Pollution Prevention Toward the Economic Measures Among the Industrial Entrepreneurs in Industrial Estate of Thailand” has informed the vision in pollution protection and factors having relationship and having no relationship with satisfaction in pollution protection by economic measure which can be discussed as follows:

5.1 Vision of Entrepreneurs in Pollution Protection for their Industrial Plants

From the research result, it had been found out that entrepreneurs mostly had their vision in pollution protection on medium level to high level (Mean = 7.55). Most of the samples were attentive to the practice with steps of planning for their production process with clarification (87.5%). Followed with steps of function in various units and planning for equipment placement (84.0%), adjustment/change/adaptation on environmental management in one’s industrial plant for better (83.6%). All of these reflect good planning and action plan.

Wantana Muangchan (1999: 9) had summarized that building-up of future image or future viewing as a future goal by bringing in planning system in use. It can also mean what one wants to see in the future which was better than at present. There has been an attention in practice by entrepreneurs in a way for an improvement, change, and adjustment for environmental management in one own plant for bettering the situation on a continuing basis. This reflects what the sample group wants to see in the future. There was in line with the concept of Thongchai Santiwong (1996: 5) who stated that vision was the definition of executives and general people. It was used as a far-sighted view for the impact and possibility of future world with high degree of

change. Things will be innovative with no pattern as it had been seen in the past world. The vision was used as a mechanism to view the world of change as per fact. It was clearly seen for one to adapt the use for oneself and own development in order to be in line to each other. One can also be ahead or can win the competitors amid new conditions in global current. There was in line with the concept of Boonyoo Kohpornprasert (1997: 25) who summarized that vision was important to the organization nowadays, especially those with an impact from the globalization.

5.2 Satisfaction of Entrepreneurs in Industry Towards Economic Measure

From the research result, it can be seen that the entrepreneurs in industry mostly were satisfied with economic measure overall on a medium level up to high one (Mean = 78.58). Upon considering their satisfaction towards economic measure in terms of type of pollution, it had found out that their satisfaction was on high level. They were satisfaction towards economic measure on waste water (Mean = 19.11), on air pollution (Mean = 19.44), on solid waste (Mean = 19.81), on waste residue and hazardous waste (Mean = 20.22). This might arise from financial incentives to entrepreneurs in their environmental adjustment which had a direct impact on individual, especially the measure on subsidy system from the state.

5.3 Factors Related to the Satisfaction with Economic Measure

From the study on various factors with satisfaction towards economic measure in pollution protection with the test of Multiple Regression Analysis, it had found out that 2 independent variables having statistical significance to be selected were vision of entrepreneurs in pollution protection from industrial plants and knowledge and understanding of entrepreneurs towards economic measure as follows:

$$Y_{(\text{satisfaction})} = 67.558 - .829X_1 (\text{vision}) + .584X_4 (\text{Knowledge and understanding})$$

It can be seen that the coefficient of vision of entrepreneurs in pollution protection had a minus value. This demonstrates that the entrepreneurs were satisfied with economic measure in pollution protection on a high level. But they were satisfied with vision on pollution protection on a low level. This might due to the fact that the entrepreneurs were satisfied with the measure but not on vision in pollution protection. They might not perceive the necessity in having the vision for practicing in accordance to rules and regulations. However, they might be satisfied to some economic measure which they think that there will be a good economic return. The coefficient value of knowledge and understanding towards economic measure was in a plus value. This demonstrates that the entrepreneurs had their knowledge and understanding towards economic measure on a high level which in turn heighten the level of their satisfaction in economic measure. This might due to the fact that the entrepreneurs understand the mechanism in marketing as an incentive for pricing as well as taking into consideration the competitive advantages in commerce and profits.

5.4 Factors Related to Vision of Entrepreneurs in Pollution Protection

From the study of various factors in relation to the vision of entrepreneurs in pollution protection by the test of Multiple Regression Analysis, it had found out that there were 2 factors with statistical significance to be selected, they were satisfaction towards economy measure in pollution protection and time period in business conduct of the industrial plant as follows:

$$Y_{(\text{vision})} = 6.390 - 1.873X_{1(\text{satisfaction})} + 6.779X_{3(\text{Time period})}$$

It can be seen that the coefficient in the satisfaction towards economic measure had a minus value. This demonstrates that the entrepreneurs have their vision in pollution protection on a high level, but their satisfaction towards economic measure for pollution protection is low. This might due to the fact that entrepreneurs do not agree with some economic measure ie. charges, fee, taxation schemes. They can not see direct benefit in concrete term therefrom. Most of the entrepreneurs

perceive financial incentives prior to anything else. The coefficient value in time period for business conduct has its positive value. This demonstrates the time period of business conduct for certain time length which enables the entrepreneurs to perceive the importance of environmental management and the pollution emitted to the public space on a long term basis. Being Green Plant is a good image for industrial plants with vision on pollution protection arised from the plants themselves. There was in line with Kitti Pongkapayak et al (quoted in Walliya Niwatwong, 2001: 49) who stated that the need or the policy of high-ranked executives as well as better image with no future environmental problem was the most important motive.



CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

The research on “Vision and Satisfaction in Pollution Prevention Toward the Economic Measures Among the Industrial Entrepreneurs in Industrial Estate of Thailand” has known the vision in pollution protection and the factors related and having non-related with the satisfaction in pollution protection by economic measures. This can be discussed as follows:

6.1 Conclusions

In the research on “Vision and Satisfaction in Pollution Prevention Toward the Economic Measures Among the Industrial Entrepreneurs in Industrial Estate of Thailand” can be summarized as follows:

6.1.1 General Features of Entrepreneurs in Industry

From the result, it had found out that most of the entrepreneurs were female with the aged between 30-39 years. Their educational level were Bachelor’s degree and were in automobile part industry with the business establishment of not less than 10 years.

Environmental management as a whole of most of industrial plants does not require the report on environmental impact assessment, they do not enter ISO 14001 environmental management system, as well as there was no officers in charge to control and supervise for environmental management system. Most of the waste from production were mostly in solid waste. Complaints on most of pollution problem were none. As a whole, industrial plants had their own environmental management.

The management for environment of the plants can be categorized into waste water, air pollution, solid waste and hazardous waste. It had been found out that the management on waste water of the plants mostly do not had their own waste water treatment since there was central waste water treatment in the estate. The private sector was then hired to manage the residue from the treatment. Most of the key problems in the control of waste water treatment was high supervision cost. For air pollution management, most plants use electronics power from production process in the heating step. Dust and smoke had been emitted to the atmosphere the most. The plants do not had their own air pollution treatment. Since there was pollution emission in the air as per legal requirement. Key problem from the use of fuel in production process was the impact on health. From the management of solid waste and hazardous waste, it had found out that the solid waste from the production process were mostly paper, plastic, and metal, respectively. For hazardous waste from production process mostly were in chemical container, oil or oil grease, and deteriorated chemical substances or expired ones respectively. The solid waste and hazardous waste occurred can be recycled by the hiring of private sector to get rid of them. Key problem in getting rid of solid waste and hazardous waster are high cost.

From the study on knowledge and understanding of entrepreneurs towards economic measure in pollution protection in industrial plants and the awareness of entrepreneurs towards pollution problem from the industrial plants, it had been found out that most of the entrepreneurs had the knowledge and understanding in relevance to economic measures and awareness towards pollution problems in plants on an overall basis on medium level.

6.1.2 Vision of the Entrepreneurs in Pollution Protection

From the result, it had been found out that entrepreneurs in plants mostly have their vision on the said issue on a high level. Overall, they had their plans, improvement, changes and adjustment on the result of environmental management within their own plants on a better manner. As well, they were equipped with pollution protection policy.

6.1.3 Satisfaction Towards Economic Measure in Pollution Protection

From the result, it had found out that entrepreneurs in the plants mostly had their satisfaction towards economic measure overall on a medium level. However, upon considering their satisfaction towards economic measure in pollution category, it had found out that the satisfaction level was high. They were satisfaction towards economic measure in waste water, in air pollution, in solid waste, and in hazardous waste and toxic substances.

6.1.4 Factors Related to the Satisfaction with Economic Measure

From an analysis on factors related to the satisfaction towards economic measure in pollution protection, out of 287 respondents, it had been found out that variables related to the satisfaction in the said issue, there were 2 independent variables (out of 5) with prioritized importance were having officers in charge for environmental control, having knowledge and understanding of entrepreneurs towards economic measure and having vision of entrepreneurs in pollution protection. As well, the factor also includes the ability to predict the vision of entrepreneurs in the said issue at 6.4% at statistical significance at 0.05 ($R^2 = 0.064$).

6.1.5 Factors Related to Vision of Entrepreneurs in Pollution Protection

From an analysis on factors related to vision of entrepreneurs in pollution protection, out of 287 respondents, it was found out that, variables related to vision of entrepreneurs in the said issue are 2 independent variables (out of 5), with prioritized importance as follows: industrial plants with environmental management, with officers in charge for environmental control, with time period in business conduct, and satisfaction of entrepreneurs in economic measure. The plants also had the ability to predict their vision in pollution protection for 32.7% with statistical significance at 0.05 ($R^2 = 0.327$).

6.2 Recommendations from the Studies

From this study, the researcher had following opinion and suggestion as follows:

6.2.1 From this research, it had been found out that the entrepreneurs in industrial plants mostly had the vision in pollution protection. Nevertheless, the satisfaction towards economic measure in pollution protection was on low level. Thus, there should be relevant units in disseminating and in publicizing all data, regardless of good or bad ones towards economic measure to the entrepreneurs. There was specially true to the entrepreneurs who do not have knowledge and understanding towards economic measure in order to gain acceptance of the said measure in pollution protection more.

6.2.2 From the research, it had found out that the entrepreneurs were aware of the pollution problem on medium level. Upon considering on environmental management, the industrial plants had environmental management as per legally required only. Thus, relevant units should train or should hold meeting with entrepreneurs for them to be aware and to give importance on the pollution problem occurred to the environment.

6.2.3 There should be measure in order to promote and support the entrepreneurs in industry to accept economy measure, which were, environmental study as well as training both for executive and heads in various units. The aim was to know the mechanism in taking in economic measure to apply with one's industrial plant. State units and private sectors should promote incentivized media to accept economic measure by publicizing and offering the alternatives for such measure. This will demonstrate the benefits of economic measure on a continuing basis.

6.3 Recommendations for Future Research

6.3.1 This time research had found out the factors related to vision of the entrepreneurs in pollution protection were in some factors only. There might be some other factors, therefore, there should be a study on concept or theory as well as other

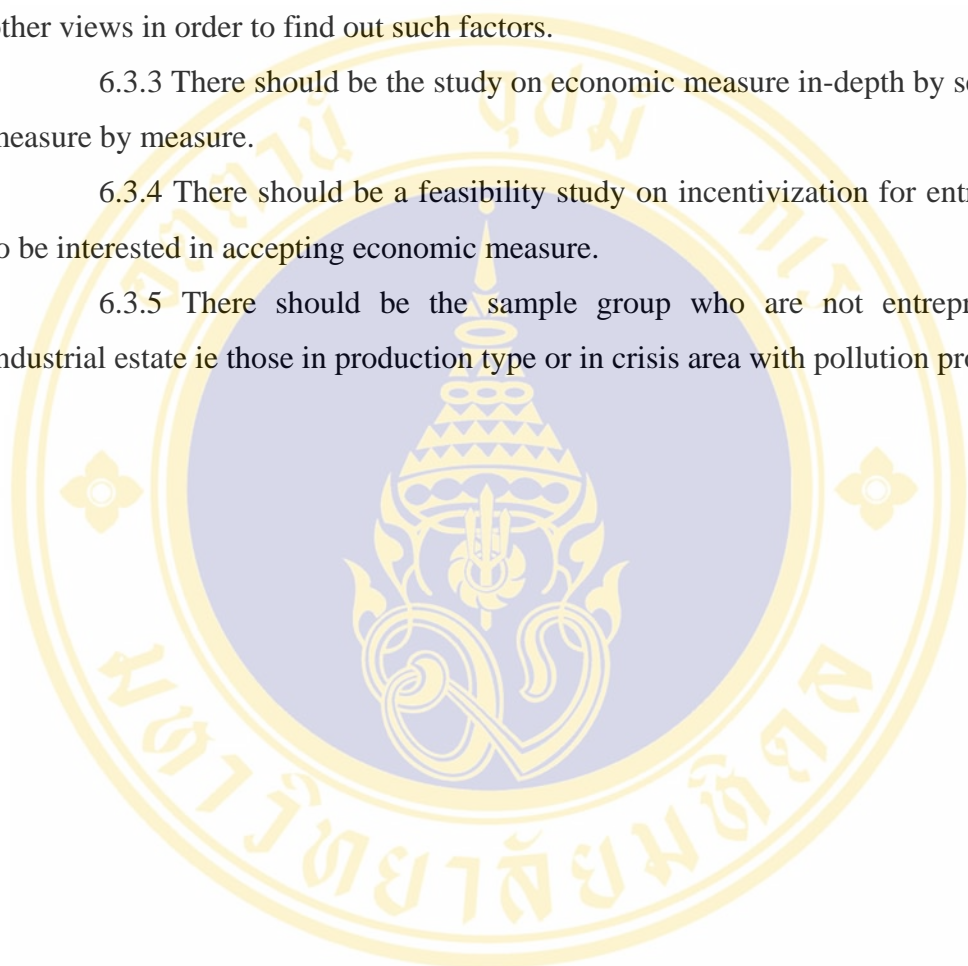
views in order to find out such factors.

6.3.2 This time study had found out the factors related to the satisfaction towards economic measure in pollution protection for some factors only. There might be some other factors, thus there should be a study on concept or theory as well as other views in order to find out such factors.

6.3.3 There should be the study on economic measure in-depth by segregating measure by measure.

6.3.4 There should be a feasibility study on incentivization for entrepreneurs to be interested in accepting economic measure.

6.3.5 There should be the sample group who are not entrepreneurs in industrial estate ie those in production type or in crisis area with pollution problem.



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บริหารส่วนตำบลต่อการพัฒนาทรัพยากรมนุษย์ กรณีศึกษาองค์การบริหารส่วน
ตำบลจังหวัดชุมพร.วิทยานิพนธ์ปริญญาศึกษาศาสตรมหาบัณฑิต,สาขาประชากร
ศึกษา, บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.





แบบสอบถามประกอบการวิจัย

เรื่อง

วิสัยทัศน์และความพึงพอใจในการป้องกันมลพิษโดยใช้มาตรการทางเศรษฐศาสตร์
ของผู้ประกอบการโรงงานในนิคมอุตสาหกรรมของประเทศไทย



ส่วนที่ 1 แบบสอบถามข้อมูลทั่วไปเกี่ยวกับผู้ประกอบการและโรงงานอุตสาหกรรม
คำชี้แจง โปรดเขียนเครื่องหมาย ✓ ลงใน และเติมข้อความลงในช่องว่างให้ตรงกับ
ข้อเท็จจริงเกี่ยวกับตัวท่านมากที่สุด

1. เพศ ชาย หญิง
2. อายุ 20-29 ปี 30-39 ปี 40-49 ปี 50 ปีขึ้นไป
3. ระดับการศึกษาสูงสุดของท่าน
 1. ประถมศึกษา 4. ปวส. อนุปริญญา หรือ เทียบเท่า
 2. มัธยมศึกษาตอนต้น 5. ปริญญาตรี หรือ เทียบเท่า
 3. มัธยมศึกษาตอนปลาย หรือ ปวช. 6. สูงกว่าปริญญาตรี
4. โรงงานอุตสาหกรรมของท่านจัดเป็นประเภทใด
 1. อุตสาหกรรมเกี่ยวกับอิเล็กทรอนิกส์ 5. ผลิตภัณฑ์จากผ้า
 2. อุตสาหกรรมเกี่ยวกับยานยนต์ 6. ไม่แปรรูป
 3. อุตสาหกรรมเกี่ยวกับเคมีภัณฑ์/สารเคมี 7. เครื่องประดับ
 4. การเกษตรแปรรูปพืชผลและอาหาร
5. ระยะเวลาที่เปิดดำเนินการ.....ปี
6. โรงงานของท่านเข้าข่ายต้องจัดทำรายงานผลกระทบสิ่งแวดล้อม (EIA) หรือไม่
 1. ต้องจัดทำ 2. ไม่ต้องจัดทำ
7. โรงงานของท่านมีของเสียจากขั้นตอนการผลิตด้านใดบ้าง (โปรดระบุให้ครบถ้วน)
 1. น้ำเสีย 4. กากของเสียอันตราย
 2. อากาศเสีย 5. อื่น ๆ (ระบุ).....
 3. มูลฝอย

8. โรงงานของท่านเคยถูกร้องเรียนเกี่ยวกับมลพิษหรือไม่
 1. เคย 2. ไม่เคย
9. โรงงานของท่านได้เข้าสู่มาตรฐานระบบการจัดการสิ่งแวดล้อม ISO 14001 หรือไม่
 1. เข้าระบบ 2. ไม่ได้เข้าระบบ
10. โรงงานของท่านมีเจ้าหน้าที่ผู้ควบคุมดูแลระบบการจัดการสิ่งแวดล้อมหรือไม่
 1. มี 2. ไม่มี
11. โรงงานมีการจัดการด้านสิ่งแวดล้อมหรือไม่
 1. มี 2. ไม่มี

การจัดการด้านน้ำเสียของโรงงาน

12. โรงงานของท่านใช้แหล่งน้ำจากที่ใดในกระบวนการผลิต
 1. น้ำประปา
 2. น้ำบาดาล
 3. แหล่งน้ำอื่น ๆ
13. แหล่งรองรับน้ำทิ้งจากกระบวนการผลิตของโรงงานท่านคือแหล่งใด
 1. แม่น้ำ / คลอง
 2. ระบบบำบัดน้ำเสียรวมของนิคมอุตสาหกรรม
 3. ท่อระบายน้ำทิ้งสาธารณะ / รางระบายน้ำทิ้งสาธารณะ
 4. แหล่งน้ำอื่น ๆ
14. โรงงานของท่านมีระบบบำบัดน้ำเสียหรือไม่
 1. มี (โปรดตอบข้อ 15-17) 2. ไม่มี
15. โรงงานของท่านมีการจัดการกากตะกอนที่เหลือจากการบำบัดน้ำเสียอย่างไร
 1. จ้างเอกชนหรือหน่วยงานของรัฐนำไปกำจัด
 2. นำไปใช้ประโยชน์ เช่น นำไปถมที่ หรือ นำไปทำปุ๋ย
16. โรงงานของท่านมีการจัดการน้ำเสียหลังจากผ่านระบบบำบัดแล้วอย่างไร
 1. ระบายลงท่อน้ำทิ้งสาธารณะ 4. หมุนเวียนกลับมาใช้ใหม่
 2. ลงแหล่งน้ำสาธารณะ 5. อื่น ๆ (ระบุ).....
 3. ลงบนพื้นดิน

17. ปัญหาในการควบคุมระบบบำบัดน้ำเสีย (โปรดระบุให้ครบถ้วนและระบุข้อที่เป็นปัญหามากที่สุด)

1. มีกลิ่นรบกวน
 2. ค่าใช้จ่ายในการดูแลระบบสูง
 3. ขาดเจ้าหน้าที่ที่มีความรู้ความสามารถ

การจัดการด้านอากาศเสียของโรงงาน

18. แหล่งพลังงานในโรงงานของท่านมาจาก

1. น้ำมัน
 2. ไฟฟ้า
 3. ก๊าซธรรมชาติ

19. โรงงานของท่านใช้เชื้อเพลิงในขั้นตอนใดบ้างของกระบวนการผลิต (โปรดระบุให้ครบถ้วน)

1. การต้มวัตถุดิบ 3. การผสมวัตถุดิบ
 2. การอบวัตถุดิบ 4. การให้ความร้อน

20. โรงงานของท่านปล่อยมลสารอะไรบ้าง (โปรดระบุให้ครบถ้วน)

1. ก๊าซซัลเฟอร์ไดออกไซด์ (SO₂)
 2. ก๊าซไนตริกออกไซด์ หรือ ก๊าซไนโตรเจนไดออกไซด์ (NO_x)
 3. ก๊าซคาร์บอนมอนอกไซด์ หรือ ก๊าซคาร์บอนไดออกไซด์ (CO_x)
 4. ก๊าซโอโซน (O₃)
 5. สารคลอโรฟลูออโรไฮโดรคาร์บอน (CFC)
 6. ฝุ่นละออง/เขม่าควัน
 7. ไอสารเคมี/ไอกรด/ไอน้ำมัน/ไอสารอินทรีย์ที่ระเหยได้
 8. อื่น ๆ (ระบุ).....

21. โรงงานของท่านมีระบบบำบัดอากาศเสียหรือไม่

1. มี (โปรดตอบข้อ 23) 2. ไม่มี (โปรดตอบข้อ 22)

22. โรงงานของท่านปล่อยมลพิษทางอากาศ เป็นไปตามมาตรฐานที่กฎหมายกำหนดไว้หรือไม่

1. เป็นไปตามที่กฎหมายกำหนด
 2. ไม่เป็นไปตามที่กฎหมายกำหนด เพราะ (โปรดระบุข้อจำกัดหรือปัญหาและอุปสรรค)

23. ปัญหาที่เกิดจากการใช้เชื้อเพลิงในกระบวนการผลิต (โปรดระบุให้ครบถ้วน)

1. ราคาแพง 2. ขาดแคลน 3. ก่อให้เกิดผลกระทบต่อสุขภาพ

การจัดการด้านมูลฝอยของโรงงาน

24. มูลฝอยที่เกิดจากกระบวนการผลิต มีอะไรบ้าง (โปรดระบุให้ครบถ้วน)

- | | |
|--|--|
| <input type="checkbox"/> 1. กระดาษ | <input type="checkbox"/> 5. แก้ว เศษกระเบื้อง |
| <input type="checkbox"/> 2. พลาสติก | <input type="checkbox"/> 6. โลหะ |
| <input type="checkbox"/> 3. ยาง / หนัง | <input type="checkbox"/> 7. อื่น ๆ (ระบุ)..... |
| <input type="checkbox"/> 4. เศษผ้า เส้นใย หรือ ไฟเบอร์ | |

25. โรงงานของท่านมีการนำมูลฝอยกลับมาใช้ใหม่หรือไม่

1. มี
2. ไม่มี

26. โรงงานของท่านมีการกำจัดมูลฝอยอย่างไร (โปรดระบุให้ครบถ้วน)

1. จ้างเอกชนหรือหน่วยงานของรัฐนำไปกำจัด
2. นำไปใช้ประโยชน์ เช่น นำไปถมที่ หรือ นำไปทำปุ๋ย

27. ปัญหาในการกำจัดมูลฝอย (โปรดระบุให้ครบถ้วนและระบุข้อที่เป็นปัญหามากที่สุด)

1. ค่าใช้จ่ายในการกำจัดสูง
2. ขาดเจ้าหน้าที่ที่มีความรู้ความสามารถ
3. มีการต่อต้านจากชาวบ้านที่อยู่ใกล้เคียงบริเวณที่กำจัดมูลฝอย

การจัดการด้านกากของเสียอันตรายของโรงงาน

28. กากของเสียอันตรายที่เกิดจากกระบวนการผลิต (โปรดระบุให้ครบถ้วน)

1. สารเคมีที่เสื่อมสภาพหรือหมดอายุ
2. ภาชนะที่บรรจุสารเคมี
3. น้ำมันหรือคราบน้ำมัน
4. กากตะกอนและของแข็งที่เป็นสารอินทรีย์
5. กากตะกอนของแข็งที่เป็นโลหะหนัก
6. อื่น ๆ (ระบุ).....

29. โรงงานของท่านมีการนำกากของเสียอันตรายกลับมาใช้ใหม่หรือไม่

1. มี 2. ไม่มี

30. โรงงานของท่านมีการกำจัดกากของเสียอันตรายอย่างไร

1. ไม่มีกำจัด
2. จ้างเอกชนหรือหน่วยงานของรัฐนำไปกำจัด

31. โรงงานของท่านมีปัญหาในการกำจัดกากของเสียอันตราย หรือไม่
 1. ไม่มี 2. มี
32. ปัญหาในการกำจัดกากของเสียอันตราย (โปรดระบุให้ครบถ้วนและระบุข้อที่เป็นปัญหามากที่สุด)
 1. ค่าใช้จ่ายในการกำจัดสูง
 2. ขาดเจ้าหน้าที่ที่มีความรู้ความสามารถ
 3. มีการต่อต้านจากชาวบ้านที่อยู่ใกล้เคียงบริเวณที่กำจัดกากของเสียอันตราย

ส่วนที่ 2 แบบสอบถามเกี่ยวกับวิสัยทัศน์ในการป้องกันมลพิษและความพึงพอใจต่อมาตรการทางเศรษฐศาสตร์ในการป้องกันมลพิษจากโรงงานอุตสาหกรรม

2.1 แบบสอบถามเกี่ยวกับวิสัยทัศน์ในการป้องกันมลพิษจากโรงงานอุตสาหกรรม

คำชี้แจง โปรดเขียนเครื่องหมาย ✓ ลงใน ที่ตรงกับท่านตั้งใจปฏิบัติให้มีหรือไม่มีในโรงงานของท่าน

	มี	ไม่มี
1. การประกาศนโยบายทางด้านสิ่งแวดล้อม โดยแสดงให้พนักงานเห็นเป็นลายลักษณ์อักษร	<input type="checkbox"/>	<input type="checkbox"/>
2. แผนผังขั้นตอนการทำงานสำหรับกระบวนการผลิตที่มีคำอธิบาย	<input type="checkbox"/>	<input type="checkbox"/>
3. แผนผังขั้นตอนการทำงานสำหรับหน่วยงานต่าง ๆ และผังการจัดวางอุปกรณ์และเครื่องมือ	<input type="checkbox"/>	<input type="checkbox"/>
4. แผนการป้องกัน การเตรียมพร้อมและแผนฉุกเฉิน ที่เน้นถึงการป้องกันการ หกคลื่นและป้องกันการปล่อยของเสียในกรณีเกิดอุบัติเหตุ	<input type="checkbox"/>	<input type="checkbox"/>
5. การอบรมให้พนักงานมีความตื่นตัวในประโยชน์การลดของเสีย และประสิทธิภาพของการใช้พลังงานและผลกระทบที่เกิดขึ้น	<input type="checkbox"/>	<input type="checkbox"/>
6. การจัดให้มีการประเมินการดูแลรักษาโรงงานของท่านว่ามีประสิทธิภาพหรือไม่	<input type="checkbox"/>	<input type="checkbox"/>
7. โครงสร้างองค์กรของโรงงานท่าน มีการแต่งตั้งผู้ที่มีความรับผิดชอบในการจัดการสิ่งแวดล้อม	<input type="checkbox"/>	<input type="checkbox"/>
8. การพิจารณาถึงค่าใช้จ่ายในการบำบัดและนำของเสียไปทิ้งในฐานะที่เป็นต้นทุนการผลิตต่อหน่วย	<input type="checkbox"/>	<input type="checkbox"/>
9. การจัดให้มีการติดตามตรวจสอบมลพิษที่ปล่อยออกสู่สิ่งแวดล้อมทุกประเภท โดยให้เป็นไปตามที่กฎหมายกำหนด	<input type="checkbox"/>	<input type="checkbox"/>
10. เมื่อทราบผลการจัดการสิ่งแวดล้อมในโรงงานของท่านแล้ว ท่านมีการปรับปรุงและเปลี่ยนแปลงแก้ไขให้ดีขึ้นเสมอ	<input type="checkbox"/>	<input type="checkbox"/>

2.2 แบบสอบถามเกี่ยวกับความพึงพอใจต่อมาตรการทางเศรษฐศาสตร์ในการป้องกันมลพิษจาก

โรงงานอุตสาหกรรม

คำชี้แจง โปรดเขียนเครื่องหมาย ✓ ลงในช่องใดช่องหนึ่งในแต่ละข้อ ซึ่งเป็นคำตอบที่ท่านต้องการ

น้ำเสีย

ท่านพอใจมาตรการทางเศรษฐศาสตร์ในการจัดการน้ำเสียมากน้อยเพียงใด	ระดับความพึงพอใจ				
	ไม่พอใจ	น้อย	ปานกลาง	มาก	ไม่ทราบ
1. การจัดให้มีระบบการเก็บค่าบริการ (Charges) เช่น ค่าธรรมเนียมการทิ้งน้ำ ค่าบริการบำบัด น้ำเสีย					
2. การจัดให้มีระบบการเก็บค่าธรรมเนียม (Fee) เช่น ค่าธรรมเนียมใบอนุญาตทิ้งน้ำ หรือที่ได้รับการจัดสรรให้ทิ้งน้ำได้					
3. การเก็บภาษีเกี่ยวกับมลพิษทางน้ำ (Taxation)					
4. การจัดให้มีระบบการมัดจำ-คืนเงิน (Deposit-refund system) เกี่ยวกับการจัดการมลพิษทางน้ำ					
5. การเงินช่วยเหลือ (Subsidy) เช่น การให้เงินอุดหนุนแก่ผู้ประกอบการที่มีความต้องการจะติดตั้งระบบบำบัดมลพิษทางน้ำ					

อากาศเสีย

ท่านพอใจมาตรการทางเศรษฐศาสตร์ในการจัดการอากาศเสียมากน้อยเพียงใด	ระดับความพึงพอใจ				
	ไม่พอใจ	น้อย	ปานกลาง	มาก	ไม่ทราบ
1. การจัดให้มีการเก็บค่าปล่อยมลพิษทางอากาศ (Charges) เช่น การเก็บค่าธรรมเนียมการปล่อยมลพิษที่เป็นซัลเฟอร์ไดออกไซด์ ไนโตรเจนออกไซด์ คาร์บอนมอนอกไซด์ เป็นต้น					

ท่านพอใจมาตรการทางเศรษฐศาสตร์ ในการจัดการอากาศเสียมากน้อยเพียงใด	ระดับความพึงพอใจ				
	ไม่ พอใจ	น้อย	ปาน กลาง	มาก	ไม่ ทราบ
2. การจัดให้มีการเก็บค่าธรรมเนียมการจัดการมลพิษ (Fee) เช่น คัดค่าธรรมเนียมตามปริมาณเชื้อเพลิงที่ใช้					
3. การจัดให้มีการตั้งอัตราภาษีแตกต่างกัน (Taxation) เช่น ลดอัตราภาษีสำหรับน้ำมันไร้สารตะกั่วให้ต่างจากน้ำมันที่มีสารตะกั่ว					
4. การจัดให้มีระบบการมัดจำ-คืนเงิน (Deposit-refund system) เกี่ยวกับการจัดการมลพิษทางอากาศ					
5. การจัดให้มีระบบเงินช่วยเหลือ (Subsidy) เช่น การให้เงินอุดหนุนแก่ผู้ประกอบการที่มีความต้องการจะติดตั้งเครื่องบำบัดมลพิษทางอากาศ					

มูลฝอย

ท่านพอใจมาตรการทางเศรษฐศาสตร์ ในการจัดการมูลฝอยมากน้อยเพียงใด	ระดับความพึงพอใจ				
	ไม่ พอใจ	น้อย	ปาน กลาง	มาก	ไม่ ทราบ
1. การจัดให้มีระบบการเก็บค่าบริการ (Charges) เช่น ค่าธรรมเนียมการทิ้งขยะ					
2. การจัดให้มีระบบการเก็บค่าธรรมเนียมการจัดการมลพิษ (Fee) เช่น การเรียกเก็บค่าบริการจัดการตามปริมาณขยะที่จัดเก็บได้ และตามอัตราค่าใช้จ่ายที่เป็นจริง					
3. การจัดให้มีการตั้งราคาภาษีวัตถุดิบหรือผลผลิตที่แตกต่างกัน (Taxation) เช่น การเรียกเก็บภาษีจากวัตถุดิบหรือจากผลิตภัณฑ์ โดยคำนึงถึงการนำไปใช้หมุนเวียนใหม่ ผลกระทบต่อสิ่งแวดล้อม และค่าบริหารจัดการของเสียหรือซาก ตลอดจนอายุของผลิตภัณฑ์นั้น ๆ หรือการเรียกเก็บภาษีผลิตภัณฑ์ตามประเภทของภาชนะบรรจุ					

ท่านพอใจมาตรการทางเศรษฐศาสตร์ ในการจัดการมูลฝอยมากน้อยเพียงใด	ระดับความพึงพอใจ				
	ไม่ พอใจ	น้อย	ปาน กลาง	มาก	ไม่ ทราบ
4. การจัดให้มีระบบการมัดจำ-คืนเงิน (Deposit-refund system) เช่น ออก มาตรการให้มีการมัดจำและคืนเงินขวด ต่าง ๆ ภาชนะต่าง ๆ หรือผลิตภัณฑ์ต่าง ๆ ที่สามารถนำกลับมาใช้ ใหม่ได้					
5. การจัดให้มีระบบเงินช่วยเหลือ (Subsidy) เช่น การให้เงินอุดหนุนในการจะกำจัด มูลฝอย หรือเทคโนโลยีที่ลดปริมาณ มูลฝอย					

กากของเสียอันตราย

ท่านพอใจมาตรการทางเศรษฐศาสตร์ ในการจัดการกากของเสียอันตราย มากน้อยเพียงใด	ระดับความพึงพอใจ				
	ไม่ พอใจ	น้อย	ปาน กลาง	มาก	ไม่ ทราบ
1. การจัดให้มีระบบการเก็บค่าธรรมเนียมการ ปลดอยมลพิษ (Charges) เช่น การเรียกเก็บ จากผู้ก่อให้เกิดของเสียอันตรายตามปริมาณ สารพิษที่ปนเปื้อนในของเสีย					
2. การจัดให้มีระบบการเก็บค่าธรรมเนียมการ จัดการมลพิษ (Fee) เช่น การเรียกเก็บค่า บริหารจัดการตามปริมาณกากของเสีย อันตราย ที่จัดเก็บได้ และตามอัตราค่า ใช้จ่ายที่เป็นจริง					
3. การจัดให้มีระบบการเก็บภาษีหรือการเก็บ ภาษีผลผลิต (Taxation) เช่น การเรียกเก็บ ภาษีผลผลิตในอัตราหน่วยต่อน้ำหนักของ เสียอันตรายที่ส่งไปบำบัด หรือการลด หย่อนภาษี					

ท่านพอใจมาตรการทางเศรษฐศาสตร์ ในการจัดการกากของเสียอันตราย มากน้อยเพียงใด	ระดับความพึงพอใจ				
	ไม่ พอใจ	น้อย	ปาน กลาง	มาก	ไม่ ทราบ
4. การจัดให้มีระบบการมัดจำ-คืนเงิน (Deposit-refund system) เช่น ออก มาตรการให้มีการมัดจำและคืนเงินขวด ต่าง ๆ ภาชนะต่าง ๆ หรือผลิตภัณฑ์ต่าง ๆ ที่บรรจุของเสียอันตราย					
5. การจัดให้มีระบบเงินช่วยเหลือ (Subsidy) เช่น การให้เงินสร้างระบบรวบรวมของเสีย อันตราย					

2.3 แบบสอบถามเกี่ยวกับความรู้ความเข้าใจของผู้ประกอบการต่อมาตรการทางเศรษฐศาสตร์

คำชี้แจง โปรดเขียนเครื่องหมาย ✓ ลงในช่องใดช่องหนึ่งในแต่ละข้อ ซึ่งเป็นคำตอบที่ถูกต้อง

ข้อคำถาม	ถูก	ผิด
1. เครื่องมือทางเศรษฐศาสตร์ คือ สิ่งจูงใจให้แหล่งกำเนิดของเสีย ที่อยู่ในกระบวนการผลิตและการบริโภค ให้มีการลงทุนหรือมี พฤติกรรมไปในทางที่ดี ต่อสิ่งแวดล้อม		
2. เครื่องมือทางเศรษฐศาสตร์ เป็นเครื่องมือที่สำหรับหารายได้เข้า รัฐ อีกทางหนึ่ง และสามารถนำรายได้ดังกล่าวไปใช้ในกิจกรรม อื่น ๆ ได้		
3. การเลือกเครื่องมือทางเศรษฐศาสตร์มาใช้ ไม่จำเป็นต้องคำนึงถึง การยอมรับของสังคม		
4. ค่าบริการในการบำบัดหรือกำจัดของเสียตามคุณลักษณะ ของเสียนั้น จะไม่เกี่ยวข้องโดยตรงกับการคำนึงถึงค่าเสียหาย ด้านสิ่งแวดล้อม		
5. ค่าบริการหรือค่าการปล่อยมลพิษ มี 3 รูปแบบ ได้แก่ 1) ค่าใช้บริการ (user charges) 2) ค่าปล่อยมลพิษ (effluent charges) 3) ค่าปรับในกรณีที่ผู้ประกอบการไม่ดำเนินการ บำบัดมลพิษ (fine)		

ข้อคำถาม	ถูก	ผิด
6. การกำหนดอัตราภาษีให้แตกต่างกันระหว่างสองสิ่ง เช่น ภาษีที่แตกต่างระหว่างแบตเตอรี่ใหม่กับแบตเตอรี่เก่า ถือว่าเป็นเครื่องมือทางเศรษฐศาสตร์อย่างหนึ่ง		
7. ค่าธรรมเนียมภาคอุตสาหกรรมและภาคสารพิษ คือ ค่าบริการในการขนส่ง บำบัดหรือกำจัด และฝังกลบของเสียจากอุตสาหกรรมของศูนย์กำจัดกาก อุตสาหกรรมเสมาดำ บางขุนเทียนของกรมโรงงานอุตสาหกรรม เป็นมาตรการการเก็บค่าธรรมเนียมการจัดการสิ่งแวดล้อม		
8. การเก็บค่าธรรมเนียมการจัดการสิ่งแวดล้อมนั้น อัตราค่าธรรมเนียมที่เรียกเก็บจะเท่ากันทุกกรณี โดย ไม่สนใจขนาดพื้นที่ ปริมาณและชนิดของ มลพิษที่ แตกต่างกัน		
9. ระบบมัดจำ-คืนเงิน ระบบมัดจำ-คืนเงิน คือ การจ่าย ค่ามัดจำสำหรับผลิตภัณฑ์หรือการผลิตที่มีศักยภาพที่จะทำให้เกิดมลพิษ เมื่อผลิตภัณฑ์นั้นได้นำกลับ คืนมาหลังจากการใช้หรือเมื่อเสร็จสิ้นการผลิต จะได้รับเงินมัดจำคืน เช่น ค่ามัดจำขวด เป็นต้น		
10. ระบบมัดจำ-คืนเงิน เป็นแนวคิดที่ป้องกันปัญหามลพิษตั้งแต่เริ่มผลิตสินค้า จนถึงขั้นสุดท้ายที่สิ้นสุดอายุการใช้งานของสินค้าหรือผลิตภัณฑ์นั้น (life cycle approach)		
11. ข้อดีของระบบมัดจำ-คืนเงิน คือ สามารถนำเงินจากกองทุนไปใช้จ่ายเพื่อการพัฒนาและวิจัย หาเทคโนโลยีสะอาดมาใช้ในการบำบัดของเสียได้		
12. การสร้างตลาดซื้อ-ขายใบอนุญาตปล่อยมลพิษ มีแนวคิดในการควบคุมปริมาณของการปล่อยมลพิษในระดับที่ยอมรับได้		
13. การสร้างตลาดซื้อ-ขายใบอนุญาตปล่อยมลพิษ ต้องใช้ต้นทุนในการบำบัดมลพิษสูง		
14. ระบบการการสร้างตลาดซื้อ-ขายใบอนุญาตปล่อยมลพิษ เป็นระบบที่ส่งผลกระทบต่อสิ่งแวดล้อมน้อยกว่าการจ่ายค่าบริการ หรือค่าการปล่อยมลพิษ		
15. การให้ทุนโดยไม่ต้องจ่ายคืนของรัฐที่เป็นการช่วยเหลือโดยมีเงื่อนไข คือ เงินทุนให้สำหรับโรงงานที่ต้องการจะติดตั้งเครื่องกำจัดมลพิษที่เปลี่ยนเทคนิคการผลิตใหม่ที่สะอาด หรือลดปริมาณการปล่อยของเสีย โดยไม่ต้องมีหลักฐานและเครื่องชี้วัดที่พิสูจน์ได้		

2.4 แบบสอบถามเกี่ยวกับความตระหนักของผู้ประกอบการต่อปัญหามลพิษจากโรงงานอุตสาหกรรม
คำชี้แจง โปรดเขียนเครื่องหมาย ✓ ลงในช่องใดช่องหนึ่งในแต่ละข้อ ซึ่งเป็นคำตอบที่ท่านต้องการ

ข้อคำถาม	เห็นด้วย	ไม่เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย
1. น้ำทิ้งจากโรงงานอุตสาหกรรมต้องบำบัดให้ได้มาตรฐานก่อนที่จะระบายออกสู่สิ่งแวดล้อม				
2. น้ำทิ้งจากโรงงานอุตสาหกรรมที่ไม่ได้เป็นน้ำจากกระบวนการผลิตไม่จำเป็นต้องบำบัดก่อนระบายออกสู่สิ่งแวดล้อม				
3. น้ำทิ้งของโรงงานอุตสาหกรรมที่ผ่านการบำบัดแล้ว ควรนำมาใช้ในกิจกรรมอื่นภายในโรงงาน เช่น รดน้ำต้นไม้ ล้างพื้น เป็นต้น				
4. ผู้ก่อมลพิษทางน้ำต้องมีส่วนร่วมรับผิดชอบค่าใช้จ่ายในการจัดการมลพิษทางน้ำ				
5. ควรใช้เชื้อเพลิงที่สะอาดหรือใช้พลังงานชนิดอื่นที่ไม่มีมลพิษ เช่น น้ำ ลม แสงแดด เป็นต้น				
6. ควรเลิกใช้สารที่ก่อให้เกิดมลพิษทางอากาศ หรือทำลายบรรยากาศ เช่น สารซีเอฟซี ที่ทำให้เกิดปัญหาโลกร้อนและทำลายรูโอโซน				
7. การปลูกต้นไม้ในบริเวณโรงงาน ไม่สามารถช่วยบำบัดมลพิษอากาศได้				
8. การใช้ปล่องไฟของโรงงานเพื่อกระจายอากาศสู่บรรยากาศนั้น ควรมีความสูงไม่ต่ำกว่า 2.5 เท่าของความสูงของอาคารที่อยู่ใกล้ที่สุด				
9. การลดปริมาณกากของเสียจากแหล่งกำเนิด หรือใช้เทคนิคการผลิตที่สะอาด เป็นการจัดการกากของเสียที่ดีที่สุด				
10. ควรแยกของเสียที่สามารถนำกลับมาใช้ได้ เช่น แก้ว กระดาษ พลาสติก กระจังอะลูมิเนียม เศษเหล็ก เพื่อนำไป recycle กลับมาใช้ใหม่				
11. ควรแยกกากของเสียอันตรายออกจากกากของเสียอื่น เพื่อนำไปบำบัดต่างหาก				

ข้อความ	เห็นด้วย	ไม่เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย
12. การกำจัดภาชนะที่บรรจุของเสียอันตรายที่ไม่ถูกต้องวิธี ทำให้เกิดอันตรายต่อสิ่งแวดล้อมได้				
13. การนำกากของเสียอันตรายไปกองทิ้งไว้เป็นภูเขาในที่แจ้ง (open dumping) หรือการเผาในที่แจ้ง (open burning) เป็นการกำจัดที่ถูกต้องวิธี				
14. ควรมีการแยกเก็บของเสียอันตรายโดยเฉพาะของที่อาจเกิดปฏิกิริยาต่อกันเมื่อนำมารวมกัน				
15. ควรมีระบบป้องกันการไหลล้น มีฐานหรือภาชนะที่รองรับการไหลล้นของของเสียอันตราย				

ขอขอบคุณที่ให้ความร่วมมือในการตอบแบบสอบถาม

BIOGRAPHY

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