

CHAPTER 1

INTRODUCTION

1.1 Background and Significance of the Problem

Today the industrial development in Thailand has been quickly progressing and expanding. New and advanced technology has been used more in the production, causing the country's economic structure to be gradually changed to the industrial sector in place of agricultural sector. The progress of the new and advanced technology and technical knowledge help the people to live more conveniently, however, more often such technological progress had caused the disasters to be happened to the environmental system and the complicated states. The people have to face with unlimited number of the industrial tragedies, and the environmental pollution caused by the industry has become the great important problem for today's public health and has threatened the health of workers and the public in general, as often seen in the news.

The health problems occurring among the group of workers and the people who live in the unsuitable environment are so many, for example, the deteriorated health, accidents, contagious diseases, occupational diseases, all would have the effects against the economic, social, and mental health conditions as well as the lifestyle that have led to the severe destruction of the human resources of labor. According to the Ministry of Labor's report in 2001, workers taking risk against the diseases were found to be not

less than 1,000,000 people per year, and one of the ten most problem rated diseases were lung diseases caused by the stone dust from the cement products (Daily News, 2003: 6).

Most of the increased factories and plants are the small factories engaging in the natural raw materials business that most often create the pollution. The major and the most effected pollution against the human's health are the air pollution with smoke contamination, dust caused by grading and milling, stones and mineral ores mixing for the business operation such as stone crushing mill and lime mill. The health problems faced by the majority of such workers lead to the arising of the occupational lung disease, known as silicosis, caused by inhaling the dust, smoke, toxic substances, germs or some pathogenic production at work or the abnormality of the respiratory system leading to the phato-state within the lung, ephemeral or chronic, that would cause the death to follow, depending on the disease severity. The disease is gradually advancing, lifting by little, and by the time the condition is clearly seen the disease has spread widely, resulting in difficulty in the treatment. This would have effected the family income and the owners or operators of the establishment who have to pay for the medical expenses. Overall, the Government and the country have to lose the labor-aged human resources in case these people have become disabled or dead. According to the silicosis disease situation, it is found that the country with her geographic landscape and the risk group of population coming closer in number to Thailand is Vietnam, where the new silicosis patients are over 900 per year and if comparing to the developed countries such as the United States, where prior to the year 1970 over 1,000 people were dead.

However, following the campaign the deaths were reduced to less than 250 per year. Comparing the situation of the presence of silicosis disease in Thailand the new patients are likely to be found increasing. According to the silicosis presence situation report of the Department of Industrial Works and Department of Mineral Resources in 1995-1998, the risk group of population of 190, 653, 190, 653, 207, 581 and 211, 796 people respectively were found to be contracted with silicosis disease and the estimation of the total new patients who had the condition in line with the silicosis disease against the number of population who were in the risk group of contracting the silicosis disease of 3,226, 3,249, 1,478 and 4,393 people respectively (Kamchad Ramakul, 2001:6).

The lung disease caused by the dust was found for the first time in Thailand in 1954 when one of the workers who was working in the Wulfram mine in Kanchanaburi was detected to have the lung disease by Dr. Ninart Chinachote (Rapeephat Chacutprakat, 1995:64).

Today, with the alert measures taken by the Division of Occupational Health, for the lung disease caused by the dust for the silicosis type, in cooperation with the public health agencies in the regions, found that about 6,721 establishments around the country were at risk of having the silicosis disease with the risk group population of about 181,907 people. The industries with the risk of having silicosis disease were stone crushing mill industry, sandblasting industry, steel polishing, glass industry, lime industry and more. The operational guidelines on the occupational health had been set for the policy on the alert system and examination of the environmental quality that

would be harmful to the health by expanding the alert system to the provincial region for controlling the diseases and for the working environment of the high risk occupational group (Chuchai Suphawong, 1999:89-90).

Such condition of problems as mentioned above could be prevented. The good and easy approach was to use the protective device for the respiratory system, specially the dust protective mask. The concerned agencies were aware of the danger to be happened to the laborers, so the operators of the industrial factories and plants were encouraged to provide the workers with the dust protective devices. The law on the work safety with the environment was passed by specifying in the Section 1, Clause 7 as follows: “The establishment with the dispersed chemical substances or dust into the working atmosphere exceeding the required level must proceed to control and improve the level of the concentration of such chemical substances or amount of dust not to be exceeding the requirement, otherwise the employer is required to have the workers worn the personal protective device for safety “(The Association for Safety and Health Promotion in Workplaces, 1993, 2002).

Nakhon Si Thammarat is the province in the southern part of Thailand where 12 lime production factories business are engaged with 90 workers and 8 stone crushing mills with 279 workers (Industrial office, Nakhon Si Thammarat province, 2002). These factories cause the dust to disperse spreading up to the certain level of the atmosphere. So the workers who are working in the lime factories and stone crushing mills are considered as the risk group for having the respiratory system diseases. According to the report of Nakhon Si Thammarat Public Health Office, it was found

that the rate of sickness with diseases relating to the respiratory system of the population was the first in the province: 36,735.21 persons in 1998; 41,653.74 persons in 1999; 41,665.95 persons in 2000; 42,337.28 persons in 2001 and in 2002 (October – April) the rate of sickness was 12,686.27 persons per one hundred thousand of population (Nakhon Si Thammarat Provincial Public Health Office, 2002).

For the pilot survey of information by interviewing ten lime factory workers in Ron Phibun District, the workers were found to use the personal protective devices for dust only occasionally for the reason that they would be uncomfortable and inconvenient to talk with their friends or co-workers while wearing the protective devices, however, they would wear the protective devices at all time when on duty in packing the lime into the sacks where the lime dust were more dispersed than any other locations. The only protective devices used by the workers were pieces of cloth for closing their mouths and noses. All workers were aware of the danger of the lime dust as one of the reasons why they were sick of the respiratory system, and found that the workers were often having the conditions of coughing, sneezing and itching on the skin. The workers believed that the health was so important to themselves and families, but they had insufficient knowledge and understanding on the disease and danger from working, including the carelessness on the dust protection and the use of dust protective devices properly. Though the policy on the disease control, prophylaxis and the health promotion of the factory workers have been provided by the Ministry of Public Health and concerned agencies in the areas of Ron Phibun District, Nakhon Si Thammarat Province at all time by introducing the annual health examination for the workers, including the dissemination of knowledge to the workers and the operators of the

establishments, hoping to produce the change in health care behavior for the prevention of disease from working, but the knowledge only was not enough to push for the change of such behavior as the change of human behavior is something complicated and is involved many factors such as the belief in health or working environmental condition as well as workers health promotion policy of the establishment owners and operators.

With such reasons, the researcher, as the public health official, has realized the importance of the health and protective behavior from dust among workers who have to be in these risk conditions, and is interested in studying the protective behavior of workers from dust and the relating factories of the lime factories and the stone crushing mills in Nakhon Si Thammarat Province for the benefit of the agencies involving in the health promotion and the prophylaxis project planning for the lime factories and stone crushing mills workers in Nakhon Si Thammarat Province and other provinces as the good health promotion for the workers and as the guidelines for the next research.

1.2 Research Objectives

General objectives

To study the protective behavior from dust among the workers in lime factories and stone crushing mills in Nakhon Si Thammarat Province and the relating factors on the Socio-demographic data, health beliefs and supportive environments provided by the factories and the factory's health promotion policy.

Specific objectives are to study

1. The factors on the socio-demographic data among workers in lime factories and stone crushing mills in Nakhon Si Thammarat Province.
2. The factors on the health beliefs of workers in lime factories and stone crushing mills in Nakhon Si Thammarat Province.
3. The protective behavior of workers from dust in the lime factories and stone crushing mills in Nakhon Si Thammarat Province.
4. The factors on the supportive environment among workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province.
5. The factors on the health promotion policy of the workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province
6. The relationship between the protective behavior from dust among the workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province and the concerned factors on the socio-demographic data, health belief and supportive environment and the health promotion policy.

1.3 Variables to be Studied

The following variables were studied in this research.

Independent Variables:

1. **Factors on socio-demographic data** such as gender, age, family income, marital status, educational levels, period of time to work, job characteristic, smoking behavior and workers' sickness.

2. **Health belief factor** such as perceived susceptibility, perceived severity, perceived benefits and barriers of performing.
3. **Factors on supportive environments** such as provision of adequate dust protective devices, monitoring measures for the use of dust protective devices by workers, and the provision of the annual health examination for workers.
4. **Health policy** such as the availability of the policy on the workers health promotion in writing, the issuance of regulations for workers to use the dust protective devices strictly.

Dependent variables:

- **Protective behavior from dust among workers** such as the use of dust protective devices, the type of the dust protective devices to be used.

The primary agreement

This research is the study of the factors effecting the protective behavior from dust among workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province. The following information are covered: the factors on socio-demographic data, the health belief and the supportive environment and the health policy of workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province, using the questionnaires, interviewing forms and observation forms in collecting the data.

1.4 Operational Definitions

1. **Protective behaviors from dust** refer to the behavior in using protective devices from lime dust while on duty of the workers, measured by interviewing the workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province according to the questionnaires and by observing the behavior of workers according to the observation forms made by the researcher.
2. **Health belief** refer to the perceived susceptibility, perceived severity, perceived benefits and barriers of performing , measured by interviewing workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province, according to the questionnaires produced by the researcher.
3. **Supportive environments** refer to the provision of adequate dust protective devices, monitoring measures for the use of dust protective devices by workers, the provision of the annual health examination for workers, measured by interviewing the owners and operators of the lime factories and stone crushing mills in Nakhon Si Thammarat Province, according to the interviewing forms produced by the researcher.
4. **Health policy** refer to the availability of policy on the health promotion for workers in writing, the issuance of regulations for workers to use the dust protective devices strictly, measured by interviewing the owners and operators of the lime factories and stone crushing mills in

Nakhon Si Thammarat Province, according to the questionnaires produced by the researcher.

5. **Factors on the socio-demographic data** refer to the sex, age, family income, educational levels, marital status, length of employment, employment positions and workers' sickness, measured by interviewing workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province, according to the questionnaires produced by the researcher.

1.5 Expectation

1. To know the protective behavior from dust among workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province.
2. To know the relating factors on the socio-demographic data, the health belief model and the supportive environment and the health policy of workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province.
3. To know the relationship between the protective behavior from dust among workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province and the relating factors on the socio-demographic data, health belief, supportive environment and the health promotion policy.
4. To know the trend in the project development planning, the health promotion in the work place of the lime factories in Nakhon Si Thammarat Province and in other provinces.