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## The solution to the response to the Bac Ninh University of Physical Education and Sports to air pollution in Tu Son Town, Bac Ninh Province

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### Abstract

On the basis of determining indicators of assessment, conducting a study on the development of air pollution at 20 neighboring measuring points of Bac Ninh University of Sports, in the area of Tu Son Town, Bac Ninh Province, found that: air quality ranged from moderate to bad, there is no measure of the AQI value at good AQI. There are 8 / 20 locations that reach the average AQI at the average rate of 40%; there are 10 AQI where the AQI value is poor, accounting for 50%; there are 2 AQI places at the bad level that represent the 10% ratio. The causes from the internal and objective elements of the objective and objective meteorological factor include local endogenous, neighboring endogenous, regional endogenous, and exogenous.

**Keywords:** Air pollution, AQI index, Bac Ninh University of Physical Education and Sports, Tu Son Town, Bac Ninh Province

### Introduction

**Problem:** Air pollution is a major change in the component of air or there is a presence of strange gases causing air to clean air, with odors, reducing vision, causing climate change, causing the disease to humans and creatures. Because of the widespread environmental pollution, it is widely distributed, spreading, so pollutants are emitted into the air environment that will not focus on the spread of the environment. Bac Ninh University of Physical Education and Sports is located in Trang Ha Ward, Tu Son Town, Bac Ninh Province, with an area of 28.5 hectares, so the level of air pollution in the commune area from painting has a huge impact on the school. The study on air pollution in the commune area from Tu Son Town, Bac Ninh Province to prevent, control and respond to air pollution is the urgent duty of the town from painting and the Bac Ninh University of Physical Education and Sports.

**Method of study:** Method of analysis and synthesis of documents; methods of interview: statistical mathematical method: Collect air quality data; using SPSS software to analyze data on AQI index to evaluate fine dust PM2.5, synthesized from 20 measuring points in 12 months including industrial clusters (CCN); multidisciplinary production (industrial park); steel production; the wood; weaving and dyeing; traffic axes; the Vietnam Environment Administration compares with the scale in the AQI general index of air quality assessment incinerator in Tu Son town...

### Research results

**1. Assessment of air pollution levels in the commune in Tu Son Town, Bac Ninh Province**  
Assessment of air pollution has many indicators. According to EPA (The U.S. Environmental Protection Agency - the US Environmental Protection Agency) has five major air pollution parameters: ground ozone (O<sub>3</sub>); Fine dust pollution PM 2.5 and PM 10; Carbon monoxide (CO); Sulfur dioxide (SO<sub>2</sub>); Nitrogen dioxide (NO<sub>2</sub>).

To select the evaluation index, through interviews with officials, researchers of the provincial departments, and the ministry of natural resources and environment of Bac Ninh Province and Tu Son Town selected the AQI indicators to assess the quality of the air for air quality assessment. AQI (unit of measure  $\mu\text{g} / \text{m}^3$ ) fluctuates at 0 - 50, the air quality is good, without

affecting health; From 51 to 100, the air quality is moderate, the sensitive group should limit time outside; From 101 to 200, the air quality was poor, the sensitive group needed to limit the time outside; From 201-300, the air quality is at a dangerous level, the sensitive group should avoid going out, others limit it to the outside. And AQI > 300 (Hazardous Air Quality), everyone should stay indoors.

Bac Ninh University of Physical Education and Sports is located in Trang Ha Ward, Tu Son Town, Bac Ninh Province. The area of 28.5 hectares is directly contiguous to the places of Dinh Bang, Trang Ha, Dong Ky, Phu Khe, Chau Khe, Dong Nguyen. The quality of air at the Bac Ninh University of Physical Education and Sports is affected by the quality of air around the town in Tu Son Town.

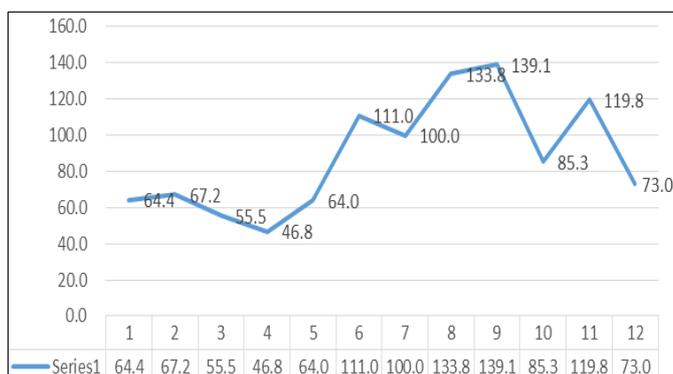
**Table 1:** Results of analysis of the AQI. 5 average dust concentration of pm2.5 in the commune area in Tu Son Town, Bac Ninh Province

No	Sampling location	Sample symbol	Location	Remarks	AQI Per year $\mu\text{g}/\text{m}^3$	Compared to the standard
1.	The intersection between Ly Thai To Street and TL295B	KK-01	Dinh Bang	Traffic road	248	Bad
2.	The intersection between Nguyen Van Cu and TL295B	KK-02	Trang Ha	Traffic road	233	Bad
3.	Area affected by the Ma Ong industrial cluster	KK-03	Dinh Bang	Steel	113	Less
4.	Area of influence of solid waste incinerator	KK-04	Dinh Bang	Waste incinerator	123	Less
5.	Area of influence of solid waste incinerator	KK-5	Dong Nguyen	Waste incinerator	188	Less
6.	Area affected by Tam Son industrial cluster	KK-6	Tam Son	Wood	142	Less
7.	The area affected by Dong Ky industrial cluster	KK-7	Co-repellent	Wood	128	Less
8.	Areas affected by Solid Waste Incinerators	KK-8	Phu Khe	Waste incinerator	161	Less
9.	The affected area of Phu Khe Industrial Complex	KK-9	Phu Khe	Wood	119	Less
10.	The affected area of Chau Khe Industrial Park 1	KK-10	Chau Khe	Steel	135	Less
11.	The affected area of Chau Khe Industrial Park 2	KK-11	Chau Khe	Steel	108	Less
12.	The area affected by the industrial cluster of Da Hoi craft village	KK-12	Chau Khe	Steel	171	Less
13.	Affected area of Tien Son Industrial Park	KK-13	Tan Hong	Multidisciplinary	93	Medium
14.	Area affected by Lo Sung Industrial Park	KK-14	Dinh Bang	Multidisciplinary	85	Medium
15.	Affected area of VSIP Bac Ninh Industrial Park	KK-15	Phu Xien	Multidisciplinary	71	Medium
16.	The area is affected by Doc Sat industrial cluster	KK-16	Dong Thousand	Multidisciplinary	85	Medium
17.	Areas affected by ITD industrial complex	KK-17	Page Down	Wood	81	Medium
18.	Affected area of Hanaka Industrial Park	KK-18	Dong Nguyen	Multidisciplinary	95	Medium
19.	The area is affected by industrial cluster of Hoi Quan trade village	KK-19	Tuong Giang	Dyeing weave	71	Medium
20.	The area is affected by Huong Mac Industrial Park	KK-20	Huong Mac	Wood	76	Medium

The average annual AQI results ranged from  $71\mu\text{g} / \text{m}^3$  -  $248\mu\text{g} / \text{m}^3$ , meaning that the air quality in Tu Son Town ranged is not bad, in which the quality ratio was not bad and bad gas accounts for 60%. There are 8 / 20 locations with average AQI, accounting for 40%; there are 10 locations with poor AQI, accounting for 50%; there are 2 locations with bad AQI, accounting for 10%.

In 20 monitoring locations, there are 14 locations adjacent to Bac Ninh University of Physical Education and Sports, of which 14 points have 4 points of average air quality, 8 points of poor quality, and 2 points of poor quality. Thus, the Bac Ninh University of Physical Education and Sports is located in a particularly polluted area.

In addition to studying the annual average pollution level in the vicinity of the school, we conducted an assessment of the monthly average pollution level development in Trang Ha Ward, where Bac Ninh University of Physical Education and Sports is located in this area. The measurement point is located at Trang Ha Library.



**Chart 1:** Results of analysis of the AQI. assessing the monthly average concentration of PM2.5 dust in Trang Ha Ward

The analysis showed that in the first months of the year (January, February, March, April, and May) the level of fine dust pollution is lower than at the end of the year. In these months the average level of contamination is fluctuating at the AQI threshold from 46.8 - 64.4  $\mu\text{g} / \text{m}^3$ ; July, August, September, October, and November dust pollution was very high at the bad threshold ranging from AQI from 73 to 139.1  $\mu\text{g} / \text{m}^3$ . Thus, at the close analysis site of Bac Ninh University of Physical Education and Sports, in 12 months, the air condition was at a good standard, check for 8.3%, which was April; There are 6 months of average air quality that is January, February, March, May, October, and December accounting for 50%. There are 5 months of poor air quality, including June, July, August, September, and November, accounting for 41.7%.

**The cause of air pollution at Bac Ninh University of Sports and Sports**

**Internal causes**

We know that the origin of the dust pollution consists of: endogenous, local endogenous, neighboring endogenous, endogenous, and exogenous.

From the results of research in table 1 and chart 1 we see, the causes of the internal causes of air pollution at the Bac Ninh University of Physical Education and Sports include:

Dust pollution at road intersections. The Bac Ninh University of Physical Education and Sports adjacent to three traffic shafts will be a bad place for air pollution. The second reason is the garbage incinerator. For all three waste incinerators in the Tu Son town, air measurement is ranked poorly. Especially though industry - handicrafts is the dominant economic sector in local socio-economic development, in addition to the area of agricultural land that is still plentiful, there are two cases of rice, the farmer has maintained the

habit of burning the crop to the ground, which is not only in the area where the surrounding areas are set up by the local area. This is also the cause of pollution from local endogenous sources

The third cause of emissions from steel and steel production clusters. These places around the air are being underestimated. This is also the cause of pollution from local endogenous sources.

Especially according to graph 1 we see in the last month of the pollution of dust, it is greatly affected by foreign sources. China has a lot of urban and industrial megacities in the world, so it's obvious that China's endogenous pollution is more obvious than ours. Winter, few cities in China are still in the habit of heating coal, oil, causing local air pollution. But when the north wind blows, the wind spreads to the south, the north is the north. So the north wind blows in winter if the wind blows the pollution can be pushed away from the north but if the wind is not too strong, pollution will be saved and resonate with the internal pollution of the north, exacerbating the picture of air pollution.

### Objective Causes

According to the results of our AQI index in all days of the year, there are clear blue days during the air pollution waves. Besides internal environmental factors, air quality is also influenced by several main reasons:

In the summer. The air is clean on the west and southwest wind days. Because of the high mountainous terrain to the west and southwest, moisture and corruption are captured on the other side.

In the autumn and winter days, when the northeast monsoon blows, convection takes place and commits to the diffusion of pollution in the air layer close to the ground. The first days of strong blowing in clean air and weak wind blowing the air will be dirty and last until the next monsoon, making winter air often dirty than other seasons of the year.

In the spring, when there is a small rain phenomenon, especially drizzle, the infection remains unchanged. In the days where the cold air is deep on the ground, hot air of the winter wind, cold air is absorbed because of the present. Heat inversions, air can not convection, it also trapped pollution, even restricted to the ground. That is why the spring days are cloudy, windy, and the air is very dirty.

Thus, in Tu Son Town, Bac Ninh Province and Bac Ninh University of Physical Education and Sports in particular, air pollution stems from all local endogenous factors, neighboring endogenous and regional endogenous factors. and exogenous, coming from internal factors and main meteorological causes.

### Solution of Bac Ninh University of Physical Education and Sports to air pollution in Tu Son Town, Bac Ninh Province

According to a study on "Risks and effects of air infection in Tu Son Town, Bac Ninh Province on the operation of Bac Ninh University of Physical Education and Sports"<sup>[1]</sup> Pollution situation in Tu Son Town has diverse origins. In fact, air infection has caused respiratory-related diseases of staff, lecturers and juniors, with the proportion of 44.1 - 87.4% getting an interaction between strong and very strong at a level.  $r$  from 0.77 to 0.96. Spend more expenses for

medical study and surgery, affect the movement of teaching and training activities of the school. To cope with air pollution, it is necessary to take the following methods:

#### Solution 1: Coordinate the involved parties, hand - to - action for clean air

- To coordinate with the natural resources and environment department of Tu Son Town in organizing the banner of propaganda bands in the holidays, anniversaries, environmental campaigns.
- Restrict pollution levels to environmental components, water, air. Inspect the observance of the law on environmental protection and take measures to handle acts of violation.
- Organize training classes for propaganda and collection of garbage in the sources for all teachers of teachers and students of the students' students at Bac Ninh University of Physical Education and Sports.
- Install more public garbage bins in living areas, study, and practice around the school. Carry out inspection work periodically. To promote the propagation, education, mobilization, and combination of administrative measures, economic and other measures to develop self - awareness, discipline in environmental protection activities in schools.
- Enhance research on air quality monitoring; research on ONKK and health of staff, teachers, employees, students-athletes in sports training institutions across the country in general and the University of Sports and Sports in particular.

#### Solution 2: Prevention and control of air pollution at Bac Ninh University of Physical Education and Sports

- Environmental protection activities at schools must regularly, take precautions as combined with pollution remediation, degradation, and improvement of environmental quality.
- Allocate personal expenditures for environmental services in the annual budget.
- Focus on monitoring air quality, through the installation of air pollution gauges at school.
- Coordinate with the managing unit and evaluating measures to measure data from existing observation stations or forecast changes in air quality in areas.
- Managing and setting up the air purification policy at the same time to implement measures to cope with air pollution.

#### Solution 3: Practical responses of Bac Ninh University of Physical Education and Sports to the air pollution

- Avoid air emissions by avoiding cooking stoves, avoid burning wood, burn trash in school; move more efficiently. Walking or cycling with short distances, with long journeys, using public transportation. Controlling emissions, not burning fresh garbage in the school. Protect and rationally use natural resources and natural resources. Reducing dust in the field of construction at the school.
- Install air pollution warnings on news bulletin boards, when pollution exceeds some level needed to take action directive, guide all lecturers, students, athletes... have measures to protect appropriate health.
- Minimize the jolt of air pollution on health by providing necessary preventive procedures, accepting scientific and effective methods of insurance to protect health such as

<sup>1</sup> Dinh Khanh Thu, Dinh Hung Truong (2020), Risks and effects of air pollution in Tu Son Town, Bac Ninh Province on activities of Bac Ninh University of Physical Education and Sports, Sports science and training journal.

putting on a mask, according to monitoring air quality to give a reasonable study schedule, escaping or canceling heavy motor activity on days with high air pollution; or given in practice subjects avoid more polluted air rule hours, avoiding months of polluted air. Example: Months with heavy air pollution such as months at the end of the year, it is advisable to practice indoors, as the first months of the year can classify outdoor activities.

- There are ideas or subjects to educate about the risk and harm of air pollution in the curriculum at the school.
- Improve self-preservation skills and adaptive skills of lecturers, students, and athletes to the development of air quality.
- Install air purifiers in classrooms and practice rooms close to the people's roads.
- Plant more trees around the school; maintaining environmental hygiene in the classroom and outside the campus; communicate, training to recover an awareness of staff, lecturers, and students about ONKK and health insurance measures; monitor and deal with the quality of the environment at the development sites / industrial zones around the school to warn of the risks of pollution.

### **Conclude**

Bac Ninh University of Physical Education and Sports is placed in an infected area ranging from  $71\mu\text{g} / \text{m}^3$  -  $248\mu\text{g} / \text{m}^3$ , from average to bad. None of the sections had a good AQI value; 40% of sites scored average AQI; 50% of the sites had poor AQI and 10% were poor

It mainly made air pollution at Bac Ninh University of Physical Education and Sports from internal and objective meteorological factors including local endogenous infection, neighboring endogenous, regional endogenous and exogenous.

In order to survive with the air pollution, Bac Ninh University of Physical Education and Sports needed to apply 3 solutions to publicity and coordination of actions; Air pollution avoidance and control and practical solutions.

### **References**

1. Vietnam Environment Administration, Decision No. 878 / QD-TCMT dated July 1, 2011 of the Vietnam Environment Administration on issuing handbook for calculating air quality index 2011.
2. Hanoi Law University. Dictionary explaining jurisprudence on Environmental Law, Economic Law, Financial Law, Banking Law, Publisher. People's Police, Hanoi 2000.
3. Pham Ngoc Dang. Air Quality Management in Hanoi, Environmental Review 2017.
4. Dergisi, M Liu – Ekoloji. Modeling and Analysis of the Influence of Atmospheric Particulate Pollution on Cardiopulmonary Function of the Exercisers. 2019. Ekolojidergisi.com.