

Environmental Issues in Traditional Craft Villages in the Red River Delta Area in Vietnam

Thu Nga Tran Thi¹, Thuy Loan Doan Thi², Phuong Diep Tran Thi³

¹Major, PhD, Vice Dean – The Faculty of Environmental Police –The Vietnamese People's Police Academy

²Major, PhD, Deputy Head - The Faculty of Environmental Police –The Vietnamese People's Police Academy

³Major, PhD, Deputy Head - The Exam Management and Quality Assurance Department - The Vietnamese People's Police Academy

Abstract: *The Red River Delta is a historical area which is the key area of socio-economic and cultural development in Vietnam. This area is located in the Red River basin of northern Vietnam, this area includes 11 provinces and cities under Vietnamese Government. The traditional craft villages are concentrated in the Red River Delta area with the largest number in the whole country. This area includes: Develop services, Trade and Tourism; Industry Development; Development of cultural and social fields; Develop agriculture and rural areas and handicraft villages. It also focuses on developing traditional craft villages and developing eco-tourism with agricultural products and handicrafts of typical oriental characteristics. In addition to economic and social achievements; protecting the environment in traditional craft villages is a particularly important task. Within the scope of this article, we are going to analyze the issues of environmental status from traditional craft village development activities as well as propose solutions to improve environmental protection in the Red River Delta area - Vietnam.*

Keywords: village, traditional craft villages, pollution, environment, environmental protection, the Red River Delta Vietnam

1. Introduction

1.1. Definition

According to the Ministry of Natural Resources and Environment, Craft villages are construed as follows: "Craft village is one or more residential clusters of hamlets, villages, hamlets or similar residential areas in a commune ward or township (hereinafter referred collectively to as the commune level) engaged in rural trades and cottage industries and handicrafts producing one or several different kinds of products".

"Village means a geographical area or a geographical area in which individuals or organizations engaged in the production of one or many different kinds of products are recognized by the competent State agencies according to certain criteria"
Pollution in villages:

1.2. Study area

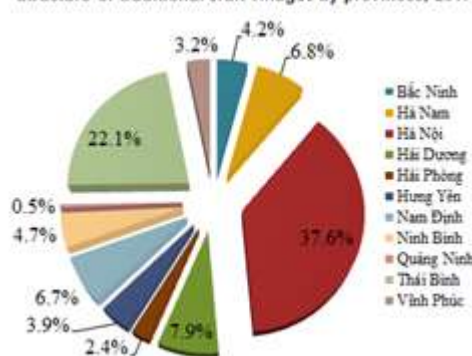
Red river delta with orientation to develop industries, specific fields, Red River Delta area of Vietnam - The key economic region of the country has developed the master plan for socio-regional society. This area includes 11 provinces in the Red River Delta.



Figure 1: The Red River Delta map, 2017

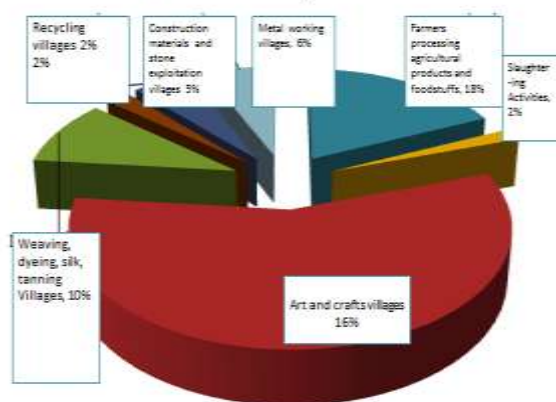
According to the report of the Ministry of Agriculture and Rural Development, as of 31/12/2016, the total number of handicraft villages and villages in our country is 5,411, of which the traditional craft villages are recognized according to the criteria of the current village. Nowadays, there are 1,864 craft villages, attracting about 11 million labors distributed in provinces and cities throughout the country. In the Red River Delta, according to a report by the Environmental Police, the number of communes with craft villages accounts for about 50% of the communes with craft villages of the whole country with 2,155 craft villages and craft villages.

Structure of traditional craft villages by provinces, 2017

**Chart 1:** The rate of structure of traditional craft villages by provinces, 2017

Trade villages in the Red River Delta are also categorized into six main production groups, such as craft villages in Vietnam: handicrafts (pottery, porcelain, fine art glass, carvings and lacquers), embroidery, lace; Food processing, food, animal husbandry, slaughtering; Textile dyeing, silk reeling, tanning; Construction materials and stone exploitation; recycle scrap; Other craft villages (such as plowing, harrowing, boat building, paper-making etc.). The trade villages in the Red River Delta have created a wide range of commodities to be consumed throughout the market. Domestic and export, focus on art items, ceramics, bamboo, silk, paper, steel, copper, aluminum... create high production value, improve the life of the kernel. By the development process, production activities in craft villages have released many kinds of untreated wastes into the environment which pollute the environment and seriously affect the health of the people.

The rate of classification of major manufacturing industries in craft villages in the Red River Delta, June 2017

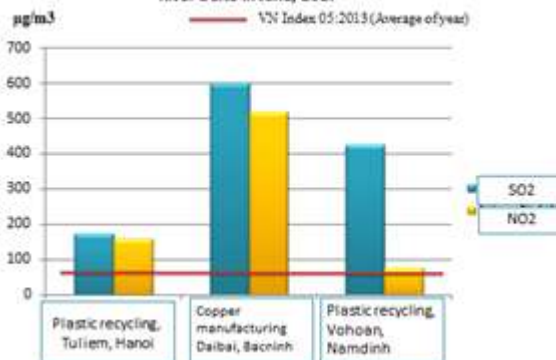
**Chart 2:** The Rate classification of major manufacturing industries in craft villages in the Red River Delta, June 2017

2. Identify the Problem

2.1 Air pollution

The study of pollution characteristics from the production of some types of craft villages shows that the emissions to the environment in the craft villages are mainly from burning fuel and the use of raw materials and chemicals. for the production

process. This generates large amounts of polluting gases (CO₂, CO, SO₂, NO_x...) and dust. Dust pollution mainly originates from pottery villages, construction materials production, stone exploitation, fine art handicraft and recycled craft villages. In particular, recycled villages generate large amounts of dust containing heavy metals and toxic material dust. Research results in a number of recycled villages using coal as fuel material emit a very high amount of dust, causing air pollution to show that the most polluting type of waste is recycled and ceramic production.

The concentration of SO₂, NO₂ in some villages in the Red River Delta in June, 2017**Chart 3:** The Concentration of SO₂, NO₂ in some craft villages in the Red River Delta in June 2017

Source: Pollution Control Department, Vietnam Environment Administration, 2010– 2017

For the village processing agricultural products, food, animal husbandry, slaughter mainly the smell. Currently, the Red River Delta has 138 certified agro-food processing villages. For the air environment, the most common source of pollution in the agricultural product processing village is the stench of long-standing raw materials and the decomposition of organic compounds in solid waste. Generate characteristic gases: SO₂, NO₂, NH₃, CH₄, H₂S.

For handicraft weaving, silkworming, tanning: The air pollution in these villages is mainly dust and chemical vapor. In the villages where weaving and dyeing, there is no system of vacuuming, ventilation to reduce the amount of cotton dust in the production area, chemical vapor pollution also no remedy. The production facilities have no chimney and have no exhaust gas treatment system.

According to the survey, at present, air pollution in recycling craft villages (paper recycling, metal recycling, plastic recycling) in BacNinh province, Hung Yen province in the Red River Delta which is identified as a group of villages causing severe environmental pollution and forced relocation.

2.2. Water pollution

The production process in craft villages requires different amounts of water, each of which has a corresponding water demand and also emits a large volume of waste water with the type of pollution into 2 groups: Organic pollution and inorganic pollution in water environment.

Organic pollutants are often emitted from food processing, livestock, and slaughtering villages. This is a very demanding industry and very high levels of organic wastewater. Typical: Duong Lieu starch processing factory (Ha Noi), the average amount of waste water discharged into the environment can be up to 7000 m³ / day and often discharge directly, not processed into the environment. According to the report of the Ministry of Natural Resources and Environment, the content of pollutants according to the COD, BOD5 or total number of Coliform bacteria in the waste water of the village has exceeded the standards allowed dozens of times, some thousand times.

According to the study, polluted water sources in rural villages in Vietnam in general, the craft villages in the Red River Delta in particular are due to inorganic toxic compounds such as acid, salt, metal heavy... (usually found in the village of mechanical, plating, casting, bleaching). These are extremely dangerous sources of pollution. Textile wastewater, dyeing is classified as the most dangerous type of wastewater, because it not only affects the surface water but also affects the groundwater source, causing many serious diseases for people living in this area. Environmental pollution caused by waste water in craft villages is one of the main causes of epidemics for people working and living in this area. The incidence of diseases in trade villages in Vietnam has been on the rise in recent years, such as skin diseases, respiratory diseases, digestive diseases, neurological diseases, gynecologic diseases, especially the incidence Cancer is relatively high.

The Red River Delta consists of many river basins: Red River Delta - Thinh Binh; Cau river basin (Cau river, Song Ngu district Khe...); In which, water quality in Cau River, Ngu District, Khe River, Nhue River flows through the area with contaminated villages due to waste water from production activities. Launching the village direct emissions to the environment. In recent years, the quality of water has improved, but there is still frequent pollution.

Characterization of Ammonium content in Ngu Huyen Khe river water from 2011 to June 2017

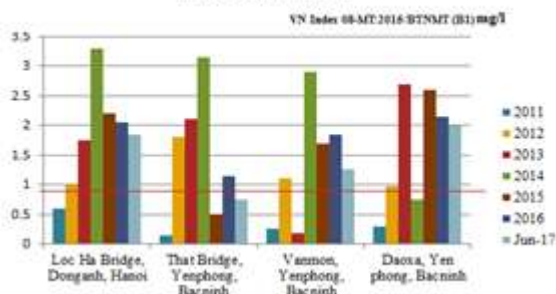


Chart 4: Characterization of Ammonium content in NguHuyenKhe river water from 2011 to June 2017

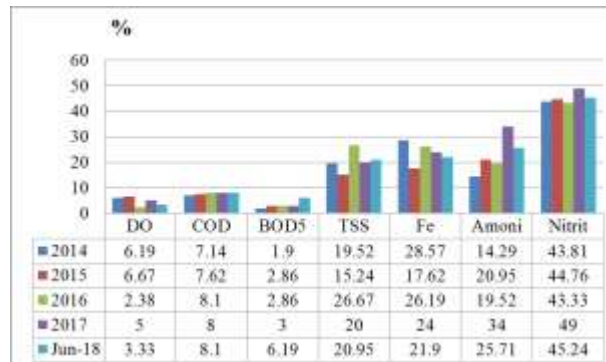


Chart 5: Evaluate the excess rate of some parameters in surface water in the basin of the bridge in the period 2014–6/2018

2.3 Solid waste

Solid waste from production activities in craft villages is still one of the most alarming issues now. Associated with each type of production, solid waste villages also exist a variety of different, including a number of major components such as: waste byproducts from food processing; glass bottles, plastic, plastic, packaging material containers, metal...Currently, solid waste from production activities in craft villages in the Red River Delta has not been well managed according to the process: Not fully collected and treated. In particular, characteristics of village solid waste contain many components of hazardous waste (metal recycling villages, oil, chemicals...).

Chart 6: Characteristics of solid waste from the production of some types of craft villages in the Red River Delta

Type of production	Solid waste
Processing food, food, animal husbandry, slaughtering	Coal slag, solid waste from raw materials
Textile, dyeing, silk reeling, tanning	Coal slag, yarns, rags, sludge and chemical packaging
Handicrafts (ceramic, porcelain, lacquer, fine arts, stone processing)	Coal slag (ceramic), waste products, chemical residue
Recycle of scrap (paper, plastic, metal)	<ul style="list-style-type: none"> Paper dust, impurities from paper, scrap, chemical packaging Coal slag, rust, heavy metal scrap ... Labels, impurities do not regenerate, rubber
Construction materials, stone exploitation	Coal slag, slag stone, slag ...

Source: Vietnam Association for Nature and Environment Protection, 6/2018

Thus, it can be seen that solid waste of village has increased over the years. Especially in the current period, preserving and promoting traditional craft villages is one of the important objectives of Vietnam. With the largest number of craft villages in the country, craft villages in the Red River Delta are one of the areas with huge emissions of wastes.

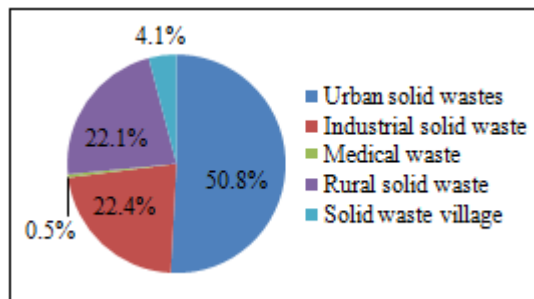


Chart 7: Composition of solid waste nationwide in 2017

3. Results and Discussion

Over the past years, the development of handicraft villages throughout the country as well as the Red River Delta has created a great motivation to contribute to poverty reduction and promote local economic development. In particular, the village has employed a large number of local laborers, effectively solving the labor problem, contributing to the country's overall economic development. However, the development of handicapped villages in the environment has left the consequences of environmental pollution is more and more serious is the pressing of the whole society.

Impact on human health: According to survey results, environmental pollution has increased disease rate, life expectancy of people decreased. Common diseases such as: skin diseases, respiratory diseases, diarrhea, eye pain ... and a number of other specific diseases. Specifically in some areas: In Ha Nam, surveyed 07 villages (NhaXa silk weaving, Doi Tam drum, Hop Ly wine, Mao Cau rice crackers, Dai Phuc sandpaper, La Mat stone, Nhat Tan multi-skilled village) had a higher incidence of dermatitis, diarrhea, respiratory and eye

pain than did non-skilled villages; In BacNinh, handicraft villages have high rates of diseases such as aluminum casting village, lead and Van Mon zinc with 44% of respiratory diseases, 13.1% of skin diseases; DaTay iron production village, the rate of workers suffering from respiratory diseases in the casting industry is 31.7% and in rolling is 31%; In Thai Binh, the craft village of Vu Hoi noodles, the accident rate in the production process is 70%, the accidents are mainly due to scald, digestive disease 28%, gynecological disease 35%, respiratory tract 22% , eye disease 9% .

Contamination of the village environment also adversely affects socio-economic development models in localities. At present, the policy of building new rural areas associated with the preservation and development of traditional trades combined with tourism is the direction of economic development in many localities such as Hanoi, NinhBinh, Thai Binh, Nam Dinh, Hung Yen... selected. However, production, processing and exploitation activities in craft villages cause a lot of gas, solid, liquid waste, hazardous waste, dust and dust to be released into the environment, thus changing the quality of the land and water environment. the air, the impact on animals and plants, the productivity of local crops and crops; At the same time, the tourism industry has been slowing down, reducing the number of tourists, leading to a reduction in local budget revenues. In addition, conflicts of social relationships in the community such as: Conflict between workers and people who do not work in the village due to environmental pollution; The area of agricultural production has been narrowed, leading to complaints, unstable security and order, affecting traditional values and culture in craft villages.

Chart 8: Characteristics of pollution from the production of some types of trade villages, 6/2018

Type of production	Types of waste			
	Emissions	Wastewater	Solid waste	Other pollution
1. Processing food, food, animal husbandry, slaughtering	Dust, CO, SO ₂ , NO _x , CH ₄	BOD ₅ , COD, SS, total N, total P, Coliform and groundwater COD, TS, NH ₄ ⁺	Solid waste from raw materials	Heat pollution, humidity
2. Textile dyeing, silk reeling, tanning, yarn	Dust, CO, SO ₂ , NO _x , acid vapor, alkaline, solvent	BOD ₅ , COD, color, total N, chemical, bleach, Cr ₆ + (tanning)	rags, sludge and chemical packaging	Heat, humidity, noise
3. Handicrafts	- Ceramics - Lacquer, wood art, stone processing - Dust, CO, SiO ₂ , SO ₂ , NO _x , HF, THC Dust, petroleum gas, solvents, oxides of Fe, Zn, Cr, Pb	BOD ₅ , COD, SS, color, industrial grease,	Coal slag, ceramics,	Waste products, porcelain
4. Recycling	- Pape recycling - Metal recycling - Plastic recycling - Dust, CO ₂ , H ₂ S, alkaline - Dust, CO, metal vapors, acid vapors, Pb, Zn, HF, HCl, THC - dust, CO, Cl ₂ , HCl, THC, solvent vapor	- pH, BOD ₅ , COD, SS, total N, total P, color - COD, SS, grease, sun, metal - BOD ₅ , COD, total N, total P, color, grease, chemicals, bleach, Cr ₆ + (tanning)	- Paper dust, impurities from waste paper, chemical packaging - Coal slag, rust, heavy metal (Cr ₆ +, Zn ₂ + ...) - Labels, non-recyclable, rubber	Thermal pollution
5. Building materials, stone	dust, CO, HF, SO ₂ , NO _x ,	SS, Si, Cr	Coal slag, rock slag, crushed stone	Heat pollution, noise, vibration

4. Solutions

4.1. Organizing better the propaganda and education to raise the awareness and responsibility of all citizens in protecting the craft villages in the Red River delta

Promoting propaganda to raise the awareness of all individuals, households and production establishments in craft villages; Giving the importance of ensuring village environment in protecting the village environment; the adverse effects of pollution, environmental degradation of the village for the health and life of the community. Building a column on "protection of craft villages" on television at central and local television stations, column "Trade village environment" on some sections of newspapers and magazines; Further expand the social networking forums (forum, blog, facebook, twitter...) on the Internet. Should organize the large-scale communication campaigns nationwide which can bring important activities on environmental protection, the major political, economic, cultural and social events in years in general and localities in particular.

4.2. Authorities develop, supplement and perfect the system of policies and legal documents on environmental protection in craft villages to create a solid legal corridor for conservation and promotion of the industry.

- On the state management of environmental protection in craft villages:

Develop and promulgate a mechanism to support investment in upgrading infrastructure for craft villages, especially for traditional craft villages.

Develop and promulgate mechanisms and policies on environmental protection in line with the characteristics of craft villages, capacity of production establishments in craft villages: Regulations on environmental protection in craft villages; National technical regulations, local technical regulations on environment; environmental protection fee for waste; To provide technical guidance on the application of cleaner production and waste treatment solutions (waste water, solid waste, exhaust gases) to production establishments in craft villages, industrial clusters and clusters.

4.3. Regarding the prevention, detection and handling of violations of environmental legislation in craft villages

The Vietnamese Police Department is responsible for preventing, investigating, detecting, strictly dealing with and punishing acts of environmental protection office in craft villages. In particular, the Environmental Police is the specialized force in the fight against violations on the environment in craft villages.

In order to facilitate the competent agencies in coordinating the handling of environmental violations in craft villages related to many ministries and branches, ministries and branches related to State management over environmental protection In the craft villages, the Ministry's agencies

continue to implement the roadmap in each period of the project of the Ministry of Natural Resources and Environment; To develop a joint circular to provide specific guidance on the responsibilities of agencies assigned to ensure good environmental protection and detect and handle violations of environmental legislation in craft villages.

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5. Conclusions

Red River Delta with orientation to develop industries, specific fields, Red river delta area of Vietnam - The key economic region of the country has developed the master plan for socio- regional society. It is very important to ensure a clean and safe environment also the economic development in craft villages in the Red River Delta. Ensuring environmental safety and economic development are always considered safely. This is a task that requires functional departments to raise the level of demand and implementation of planning, synchronization and strategy in the short term as well as in the long term. This task is not only in one region but also in the whole country. Within the scope of the paper, we point out some basic issues related to the craft village environment in the Red River Delta as well as to identify some suitable solutions for the future in order to solve the problem effectively.

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and Quality Assurance Department. Her job relates to the management of examination and marking activities, the quality assurance of teaching and testing of subjects in which the management of study and examination subjects of the Environmental Police Department.

Author Profile

Major Nga Tran ThiThu, Major Thuy Loan Doan Thi and Phuong Diep Tran Thi hold Ph.D of Law degree in the Vietnamese People's Police Academy (VPPA) in 2014 and 2017. Currently, authors are working for the Vietnamese Police Force. Mrs Nga Tran is a Vice Dean of the Environmental Police Faculty of the VPPA; Teaching and training students all types; scientific researching and directly taking part in investigating crimes in order to ensure national security. Being a liaison officer of delegation for conferences (belong to the Ministry of Public Security) in Vietnam and abroad. Taking part in conferences and studying courses in, in many countries in Africa, Asia, Australia, Europe. Mrs Thuy Loan is Deputy Head of the Environmental Police Faculty of the VPPA; Teaching and training students all types about environment field; scientific researching and directly taking part in investigating crimes in order to ensure national security. Mrs Phuong Diep is Deputy Head of the Exam Management

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