Problem of violating environmental laws in agriculture and state management orientation in Vietnam

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Abstract. In Vietnam, sustainable development in agriculture is still a new issue. After more than 30 years of developing the industry in addition to the achievements, the reality is posing many challenges when building agriculture in a sustainable way. These challenges are: agricultural production is still highly dependent on nature, mechanization is still slow ... Especially the use of pesticides, herbicides and growth stimulants, arbitrarily, there have been signs of exceeding the permissible limits of the ecological environment, leading to soil degradation, water pollution and harm to human health. This also makes the value of Vietnam's agricultural products not high, making it difficult to export to markets such as the US, EU, and Japan regularly. Vietnam needs to have solutions to improve the state management capacity in the field of agriculture.

1. Introduction
Agriculture is one of the industries that plays a very important role in the economy of every nation. It ensures domestic food security, brings a large source of foreign currency income for the cause of industrialization and modernization. Vietnam is a country where agriculture accounts for a high proportion but in the past, unreasonable policies have inhibited the development of agriculture. Starting from an outdated agriculture, Vietnam is moving forward to build a commodity-producing agriculture. After more than 30 years of implementing the renovation, the face of agriculture in our country has changed. Vietnam currently ranks 2nd in Southeast Asia and 15th in the world in exporting agricultural products. Agricultural GDP will increase by 2.66% / year, reducing rural poor households by 1.5%/year. The total export turnover in 2019 is estimated at 41.3 billion USD, an increase of 3.2% compared to 2018 [1-3]. However, a very big problem with Vietnam's agriculture is not creating sustainability. Environmental pollution is widespread in agricultural activities, including the use of plant protection chemicals, bio-stimulants, and widespread fertilizers in agricultural cultivation and by-products. Agriculture has not been completely treated, leading to food pollution, soil, water and air pollution. The process of developing animal husbandry and aquaculture produces large amounts of solid waste, sludge, antibiotics-containing wastewater, residues of growth stimulants, pathogens ...

The above issues have raised the need to further improve the role of state management in the field of agriculture. Within the scope of this article, the author analyzes the situation of pollution, violates agricultural environmental laws and proposes solutions and orientations to perfect the law and state management system in the field of agricultural environment.
2. The pollution problem in Vietnam

2.1. The water pollution problem under the impact of agricultural activities
In the research, the observations were made at 6 stations on the main branches of the Red River of North Vietnam (figure 1) for determining the level of water pollution under the impact of agricultural activities, and then predict the possibility of water pollution in the following years [4-8].

Calculation of heavy metals through the watercourse was carried out according to the formula [9-11]:

\[ R_i = Q_r \frac{\sum Q_i C_i}{\sum Q_i} \]

Where, \( C_i, Q_i \) – concentration of heavy metal and water flow, referred to at time \( i \);
\( Q_r \) – the total water flow, referred to the time intervals from the beginning to the end of the research;
\( R_i \) – total flow of heavy metals.

Results of the research were presented in table 1 [4-8].

Table 1. The weight coefficients of the indicators of TWQI and WQI.

| № | Parameters | \( C_i \) | \( C_0 \) (A) | \( C_0 \) (B) | \( q_i \) (A) | \( q_i \) (B) | \( W_i' \) (A) | \( W_i \) (A) | \( W_i' \) (B) | \( W_i \) (B) | \( W_i^* \) |
|---|-----------|---------|-------------|-------------|-------------|-------------|----------------|-------------|----------------|-------------|-------------|
| 1 | pH | 8.1 | 6-8.5 | 5.5-9 | 0.84 | 0.74 | 1.20 | 0.09 | 0.86 | 0.11 | 0.11 |
| 2 | DO | 6.8 | 5 | 4 | 0.74 | 0.59 | 1.11 | 0.08 | 0.89 | 0.11 | 0.17 |
| 3 | BOD5 | 8 | 8 | 15 | 1.33 | 0.53 | 1.75 | 0.13 | 0.17 | 0.09 | 0.11 |
| 4 | NO3 | 0.58 | 5 | 10 | 0.12 | 0.06 | 1.50 | 0.11 | 0.75 | 0.09 | 0.1 |
| 5 | PO4 | 0.1 | 0.2 | 0.3 | 0.50 | 0.33 | 1.25 | 0.09 | 0.83 | 0.10 | 0.1 |
| 6 | Dry residue | 113 | 30 | 50 | 3.77 | 2.26 | 1.33 | 0.10 | 0.80 | 0.10 | 0.07 |
| 7 | Pb | 0.04 | 0.02 | 0.05 | 2.00 | 0.80 | 1.75 | 0.13 | 0.70 | 0.09 | - |
| 8 | Cd | 0.008 | 0.005 | 0.01 | 1.60 | 0.80 | 1.50 | 0.11 | 0.75 | 0.09 | - |
| 9 | Fe | 6.8 | 1 | 1.5 | 6.80 | 4.53 | 1.25 | 0.09 | 0.83 | 0.10 | - |
| 10 | E. coli | 2400 | 5000 | 7500 | 0.48 | 0.32 | 1.25 | 0.09 | 0.83 | 0.10 | 0.16 |
Based on results of the research, the author determined the map of water pollution on the North of Vietnam for period 3 years from 2017 to 2020 (figure 2) [4-8].

![Map of water pollution in the Red River for period 3 years from 2017 to 2020.](image)

2.2. *Pollution from breeding activities*

Breeding has been identified as one of the industries that produce the most waste to the environment. Breeding waste is a rich collection of substances in all forms of solid, liquid and gas generated during breeding, storage, processing or use of waste. The breeding wastes arise mainly from: the waste of cattle and poultry themselves, such as farces, urine, feathers, skin scales ... of cattle and poultry; wastewater from rinsing, ranching, or washing of tools and equipment, cooling water or from a system of animal services; uneaten food, discarded animal products; veterinary products, dead carcasses, dead poultry, sediment from ditches, storage tanks and waste disposal. Breeding wastes contain many components that may cause environmental pollution, affecting the growth and development of cattle and poultry and human health. Therefore, understanding the composition and nature of breeding wastes in order to have appropriate management and treatment measures, to control pollution, to make use of organic-rich waste sources, for economic purposes is an job necessary, needs.

Every day, cattle and poultry emit a huge amount of manure. The amount of excreted in urine and urine can account for 1.5% - 6% of the body weight of cattle. These wastes contain high levels of pollutants. The amount of waste in livestock depends on the breed, age, development stage, diet and weight of cattle and poultry. Particularly for cattle, the amount of manure and urine increased rapidly with the process of weight gain. If calculated based on body weight, the daily excretion of breeding is very high, especially for high-yield cattle.

| Type cattle and poultry | Percentage distribution of body weight |
|-------------------------|----------------------------------------|
| Pig                     | 6.5 – 8.5                               |
| Dairy cows              | 7.5 - 9                                 |
| Beef                    | 5.5 – 8.5                               |
| Chicken, duck           | 5.5                                     |

Depending on the stage of development of cattle and poultry that nutritional needs and food
absorption varies. The bigger the cattle, the lower the digestion coefficient and the greater the amount of food excreted in the faeces. Therefore the composition and weight of manure are also different at the development stages of cattle and poultry.

Table 3. Chemical composition of pig manure is from 70 to 100 kg.

| Characteristic     | Unit | Value       |
|-------------------|------|-------------|
| Dry material      | g/kg | 202-321     |
| NH₄ - N           | g/kg | 0.64-0.74   |
| N                 | g/kg | 7.85-9.17   |
| Ash               | g/kg | 30.2-91.1   |
| Fibber            | g/kg | 147-258     |
| Carbonate         | g/kg | 0.22-0.42   |
| Short-chain acids | g/kg | 3.81-4.35   |
| pH                |      | 6.46-6.92   |

2.3. Pollution from chemicals in cultivation

Another harmful effect of insecticides is its penetration into the soil environment, which reduces the physical and chemical properties of the soil, the level of harm is similar to that of chemical fertilizers. But the ability to kill bacteria is high, pesticides also kill many useful microorganisms that reduce the biological activity of the soil.

Soil pollution by oil. Soil pollution by hydrocarbures from petroleum sources. The basic components of petroleum: Carbon 82 - 87%, hydrogen 11 - 14%, sulfur 0.1 - 0.5%, oxygen and nitrogen <few parts per thousand. Oil and petroleum products that spill on the ground will contaminate the soil because:

Just a layer of oil covering the ground, although very thin (0.2 - 0.5 mm) is enough to make the soil "suffocate" because of lack of air, the gas exchange process is cut off. As a result, all animals, plants and microorganisms lack oxygen, eventually leading to death. This oil layer also prevents the process of exchanging solar energy of the soil environment. Oil is a hydrophobic substance, when absorbed into the soil, oil pushes water out, making the soil environment almost no water and taking up all the air in the soil, making the soil minimize oxygen and water, causing damage to the ecosystem.

When penetrating into the soil, oil changes the structure and physicochemical properties of the soil, making soil colloidal particles inert and no longer able to absorb and exchange. Oil seeps through the ground into groundwater, contaminating groundwater. Oil is a high molecular weight organic compound with bactericidal properties.

Table 4. Analysis results of concentrations of oil, phenol, cyanide, and heavy metals in coastal sediments in Central Vietnam.

| Parameter     | Vietnamese standards | Year 2019 | Content (mg/kg) Year 2018 | Year 2017 | Year 2016 |
|---------------|----------------------|-----------|--------------------------|-----------|-----------|
| Oil           | 100                  | 6.6 – 16.4| 8.5 – 23.3               | 6.4 – 22.0| 8.6 – 35.8|
| Xyanuia       | <0.1                 | <0.1      | <0.1                     | <0.1      | 0.01 - 0.03|
| Zn            | 270                  | 12.2 – 132.3| 7.3 – 73.5             | 11.6 – 85.4| 7.6 – 69.2|
| Cu            | 108                  | 1.9 – 29.2| 5.2 – 29.2               | 5.1 – 33.4| 3.0 – 25.8|
| Pb            | 111                  | 2.2 – 50.6| 1.4 – 30.8               | 3.8 – 36.5| 2.4 – 43.2|
| Cd            | 4.1                  | 0.1 – 3.6 | <0.1                    | <0.1      | 0.1 – 0.3 |
| As            | 41.5                 | 1.5 – 16.8| 2.9 – 17.1               | 3.8 – 19.1| 1.6 – 8.6 |
| Hg            | 0.7                  | 0.1-0.2   | <0.1                    | <0.1      | <0.1      |
| Fe            | 1170 - 36290         | 800 - 25180| <0.1                   | <0.1      | <0.1      |
3. Actual situation of managing violations of agricultural environmental laws

Violations of the law on environmental protection have their own characteristics, the harms of criminal acts are widespread, not immediately expressed, but they accumulate and affect many people. Besides, in order to determine the extent of criminal acts, there must be a combination of relevant ministries and branches.

The law on environmental protection stipulates that there are two forms of sanctioning violations in the field of environmental protection warnings and fines, of which the maximum level of fines imposed on an act of violation is 70 million dong. In addition, violating individuals, organizations may be subject to one or many remedial measures: forced implementation of environmental protection measures for a definite time by state management agencies in charge of environmental protection request; forcible application of measures to overcome environmental pollution, degradation and incidents caused by violations; forcible taking out of Vietnamese territory or forcible re-export of goods and articles which cause environmental pollution; forced destruction of goods and articles that cause environmental pollution.

Currently, there are over 2,790 trade villages in seven industries including food processing, foodstuff, medicine; reeling, weaving, leather goods; handicrafts, embroidery; producing construction materials and other industries. These villages have brought about economic benefits and improved people's lives. Besides, the development of craft villages also puts the environment on alert. Waste from production activities of craft villages is generally not treated but discharged directly into ditches, ditches, ponds and rice fields. Commonly used fuel is coal, firewood to produce greenhouse gases such as SO2, CO2, CO, H2S, NH3, and CH4. Hazardous wastes are difficult to decompose in craft villages, especially in leather, textile, dyeing and metal recycling villages, causing BOD, COD, and SS parameters to exceed the permissible standards many times, seriously affecting the environment and the health of the people. The reason is that most craft villages have small-scale household production, experienced manual production, rough production technology, so they often do not care about waste treatment. Meanwhile, the environmental management in rural areas in general is still little attention, there is no synchronous solution of authorities at all levels on planning and improving trade village environment.

For agricultural activities, the common violations are during the arbitrary and widespread use of antibiotics, animal feeds, and plant protection drugs, which pose a risk of drug residues antibiotics, plant protection drugs in food. The treatment of breeding facilities and waste in breed have not been paid adequate attention, often discharged into natural drains.

Currently, Vietnam has 98 plants producing plant protection drugs, of which only about 1/3 of total establishments are located in industrial parks, the rest are scattered outside, interspersed in residential areas cause difficulties for management, potentially causing environmental pollution. Vietnam currently has 260 plant protection drug stores, mainly expired medicines that are exhibits of a number of unresolved violations, resulting from inspection, control and investigation. verification and verification according to outstanding criminal and administrative proceedings, most of these drugs have not been destroyed in accordance with regulations, storage and preservation activities have not been paid adequate attention, causing bad impacts on environment, heavy pollution to soil and water resources. Among them, there are 14 plant protection drug warehouses falling under the Prime Minister's Decision No. 64/2003 / QD-TTg of April 22, 2003, approving the "Plan for thoroughly handling polluting facilities." serious environmental pollution ."

The management of rural environment is still intertwined, lacking a focal agency for management, many areas are left open. In recent years, right from the central level, the rural environment management has no focal unit manage. Although, according to the assigned functions and functions, the Ministry of Natural Resources and Environment is the focal point for environmental management in general, but even in the regulations on functions and tasks, it does not clearly state the responsibility for agricultural

|   |   |   |   |
|---|---|---|---|
| Cr | 160 | 4.3 – 87.5 | 6.5 – 35.1 |
| Phenol | <0.001 | <0.001 | 4.8 – 14.2 | 5.9 – 42.0 |
environment management village. The Ministry of Agriculture and Rural Development and a number of other ministries are assigned responsibilities for environmental management in their respective branches and fields. Accordingly, for each specific field, the management work is still interwoven, there are overlapping content but there are also issues that are still open. Solid waste management in rural areas is still overlapping and has not received appropriate investment attention. According to the assignment of responsibilities, the Ministry of Construction is assigned to unify state management of solid waste, however, solid waste from agricultural activities is assigned to Agriculture and Rural Development for management and hazardous waste (including hazardous waste from agricultural production and craft villages) managed by the Ministry of Natural Resources and Environment. It is the interplay in assigning responsibility for solid waste management that makes the management work inconsistent, unclear responsibilities of the focal unit.

Not to mention, for the management of rural domestic solid waste, almost left open. For the management of clean water and rural environmental sanitation: The Law on Water Resources 2012 assigns the Ministry of Natural Resources and Environment to manage water resources nationwide (Article 70). However, the investment in infrastructure and supply of clean water in urban areas is entrusted to the Ministry of Construction for management. Particularly in rural areas, water supply infrastructure (including clean water) is assigned to the Ministry of Agriculture and Rural Development for construction and management. Rural sanitation is a very broad concept, but in environmental protection, rural sanitation is often understood as hygienic sheds and latrines.

The assignment of inspection of hygienic latrines belongs to the Ministry of Health, the construction of latrines and animal husbandry facilities is managed by the Ministry of Agriculture and Rural Development. Regarding the management of chemicals and environmental sanitation drugs: the use, collection and storage of environmental sanitation drugs are under the responsibility of the Ministry of Agriculture and Rural Development. However, the disposal and destruction of plant protection drug packages, handling of unsold storage of chemical and environmental sanitation storage is under the responsibility of the Ministry of Natural Resources and Environment in accordance with waste management regulations. Regarding environmental management in agricultural production: the General Departments and Specialized Management Departments under the Ministry of Agriculture and Rural Development assign the environmental management in agricultural production activities. Accordingly, the General Department of Irrigation is in charge of the water environment in the system of irrigation works and clean water supply; The Directorate of Fisheries is in charge of the environment in fisheries production (fishing, processing, shipbuilding) and conserving aquatic resources; The General Department of Forestry is in charge of conservation areas, national parks and biodiversity conservation; The Department of Crop Production is responsible for the use of fertilizers, controlling foreign organisms and genetically modified organisms as plant varieties; The Plant Protection Department manages the use of chemicals to prevent and treat plant diseases.

At the local level, the Departments of Agriculture and Rural Development are also assigned to assume the task of environmental protection in agriculture rural and provincial levels in agriculture and rural development.

However, at present, in most localities, the Department of Agriculture and Rural Development does not have a specialized environment management department in agriculture and rural areas, so this unit only participates in coordination with Department of Natural Resources and Environment in rural environment management issues. This is also an inadequate problem when there are no uniform regulations on the rural environmental management organization system. Responsibility and capacity of the management and enforcement units are not high. The division of responsibilities has been stipulated in the legal documents. However, the implementation according to the responsibilities of each industry and each level still exists. At present, environmental management integrated into the sector management functions will inevitably lead to the task of environmental protection being put down to the second rank compared to the goal of fulfilling the socio-economic development targets festival. However, this model is no longer consistent with the Party's and the Environmental Protection's national sustainable development orientation during the country's industrialization and modernization period.
At the local level, the environmental protection in many rural areas is not good, the environment is still polluted by sewage, and domestic waste is not collected and treated. This shows that the responsibility of the management units and the effective implementation of regulations in legal documents is not high. Especially the responsibility of the direct management unit in rural areas is the commune People's Committees. One of the important reasons is the difficulty in directing and operating from higher levels, on funding, on land fund for planning environmental protection works, and on human resources to implement the organizational stage, inspection, supervision ... almost missing and weak. The issue of human resources and management and enforcement capacity of units, especially at the local level, have been a problem existing for many years. With a limited number of staff at management units, at the commune level, environmental officials are mostly part-time, and have not been paid attention to training and improving professional skills, so it is difficult to promote public efficiency operative.

4. The state management orientation in Vietnam

In the coming years, the implementation of the Socio-Economic Development Strategy with the goal of bringing the country to sustainable development is extremely important. This is also a period when Vietnam faces many opportunities and challenges in the process of international integration, including environmental protection. In order to improve the efficiency of state management of agricultural environment, some of the following solutions need to be considered and implemented:

Firstly, the authorities need to solve the public issues that are pressing public opinion, while the direction of sustainable development, shifting the growth model towards a green economy is demanding increasingly higher for environmental protection work. The environmental cases need to be promptly and thoroughly resolved.

Secondly, the role and responsibility of the State and economic sectors for environmental protection need to be improved. The state needs to grasp the basic principles "polluters pay"; “Environmental beneficiaries must be responsible to pay” from which to develop environmental price and charge mechanisms in line with the market mechanism, ensuring sufficient investment for prevention, overcome pollution and improve the environment. The revenue from the environment should prioritize the return of investment in environmental protection, cannot continue to be abused to spend and use for other purposes.

Thirdly, the State needs to identify the goals for the protection of agricultural environment in 2020. We need to proactively adapt to climate change, prevent natural disasters and reduce greenhouse gas emissions, there has been a fundamental change in exploitation and use of natural resources in a rational, efficient and sustainable manner; curbing the increase of agricultural environmental pollution, biodiversity decline to ensure the quality of the living environment, maintaining ecological balance, towards a green and environmentally friendly economy.

Fourthly, the institution of ownership and management of the country's natural resources needs to be clarified. Accordingly, the entire people own the natural resources and the State is the management representative. The natural resources must be firmly grasped through the promotion of basic surveys, strict management, ensuring in-depth and highly efficient exploitation; limiting the export of raw resources and exploitation of natural resources causing agricultural environment pollution.

Fifthly, agricultural environmental pollution and environmental degradation issues need to be well understood, which not only poses a threat to individual safety and security, but is also one of the major threats. threaten national security and the survival of human society. Therefore, environmental security issues need to be adequately addressed in the content of national defense, security and national defense.

For each specific industry, it is necessary to have separate solutions. In animal husbandry, it is possible to study the technology of animal waste treatment with high treatment efficiency and appropriate investment cost, solid separation technique for composting and post-biogas treatment facilities before discharging into environment. Gradually perfect mechanisms and incentive policies provide financial support towards accessibility to enterprises investing in the field of animal husbandry with construction of biogas plants; subsidizing the consumption of compost products from waste,
subsidizing the consumption of electricity with farms that use the system of generating electricity from biogas and developing cleanly.

In agriculture, strong agricultural groups need to be formed in the context of globalization and economic integration today. Establishing strong agricultural groups helps Vietnamese agricultural products to be stable and develop the domestic market as well as being able to compete with international agricultural products. Especially, in recent times, many types of agricultural products of other countries have entered Vietnam market and compete very strongly with Vietnam’s agricultural products. Therefore, it is necessary to have policies to encourage businesses to invest in agriculture and rural areas.

5. Conclusion
To ensure food security, ensure sustainable agricultural production, it is impossible not to continue the intensive cultivation and use of fertilizers appropriately. The environment around us is becoming more and more polluted due to the impact of too many factors, including agricultural production. There is a clear need for a comprehensive solution for agricultural production, food security and climate change adaptation, reducing greenhouse gas emissions.

Along with ensuring food security is the process of commercialization of products, thus propaganda and education to raise awareness of savings from producers, distributors, processors and consumers to improve profitability profit to protect the environment and reduce greenhouse gas emissions. It is to increase the competitiveness of agricultural production, ensure sustainable development, and contribute to building an environmentally friendly agriculture, saving farmers and the whole society.

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