

# The Impact of Ecological Culture on the Sustainable Environmental Development in the Northern Mountainous Region of Vietnam in Recent Years

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**Abstract** The Northern mountainous region of Vietnam is an area that is strategically important for socio-economy, national defense, security and external relations of whole country, especially play an important role in the ecological environment of entire Northern region. Currently, some northern mountainous provinces become hot locations for economic development that attract foreign investment with rapid growth rate. However, the degradation and environmental pollution poses important challenges for target of sustainable development. Researching the impact of ecological culture on sustainable environmental development in the Northern mountainous region is very meaningful and contributes to sustainable development of the region as well as whole Northern region in Vietnam today.

**Keywords:** *northern mountainous region, Vietnam, ecological culture, sustainable development, ecological environment*

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## 1. Introduction

Many scientists concern about and research on the impact of ecological culture on sustainable development in term of different aspects to give the philosophy of ensuring sustainable development.

Firstly, regarding role of ecological culture and human-to-ecological environment relationship for sustainable development, the articles [1-5] set out directions and objectives and propose a number of basic solutions to handle the relationship between human and nature for purpose of sustainable development, in which emphasizes that the development needs to keep sustainable development of ecological environment. The work [6] researches on and provides basic solutions to solve ecological problems in order to ensure sustainable development, in which: "first of all it is necessary to develop ecological consciousness, which means restructure human notions about the relationship between human (society) and nature" [6]; p.120-121]. To promote the values of ecological culture in sustainable development, it is required to enhance native knowledge about ecological culture of ethnic minorities with ecological environment protection, ecological balance [7]. The articles that directly discuss ecological culture, the role of eco-culture for sustainable development such as [8,9,10], concern about the values

and role of ecological culture for development of society towards sustainable development. The article [11] indicates the role of environmental culture for social development, namely: contribution to improvement of moral personality, construction of a civilized society and motivation for development of economy and society. The articles [12,13] show the basic principles of the relationship between human and society and nature for sustainable development.

Secondly, in term of philosophy, motivation for development of society towards sustainable development, the works [14,15] appreciate the role of ecological culture for social modernization today: "Ecological culture is both an aspect of global issue and an issue of whole ecology" [15], p.60]. In the article [16], author Holger Rogall insists on the development of economy towards sustainable development to ensure a high living standard with full ecological, economic and cultural - social well-being for individuals in current and future society, "provided that it must be within limited tolerance of nature" [16]; p.72]. The article [17] proposes opinions and principles to address relationships in the process of modernizing society and ecological environment, promoting sustainable development. The author supposes that it is necessary to develop ecological culture [17], p.46] as one of the perspectives and principles for sustainable development.

Thirdly, in term of ecology and humanistic ecology for sustainable development, the works [18] supposes that

ecology needs to research on “Self-regulation rules of biosphere and methods to use by humans to ensure natural conditions for development of society” [[18]; p.145]. Summary record of Scientific Conference [19] approach humanistic ecological aspect to solve issues on environment and sustainable development in Vietnam today. The articles [20,21] affirm that human is a part of ecosystem, and human awareness and behavioral culture towards the ecosystem has impact on the development of humanity.

The Northern mountainous region of Vietnam is an area that is strategically important for socio-economy, national defense, security and external relations of whole country, especially play an important role in the ecological environment of entire Northern region. Regarding role of ecological culture for sustainable development in the northern mountainous region of Vietnam, the article [22] surveyed and evaluated the impact of ecological culture on sustainable development of the northern mountainous region in Vietnam, but it has no in-depth systematic look about impacts of ecological culture on sustainable environmental development in the northern mountainous region of Vietnam. Researching the impact of ecological culture on sustainable environmental development in the Northern mountainous region is very meaningful and contributes to sustainable development of the region as well as whole Northern region in Vietnam today.

## 2. Content

### 2.1. Some Theoretical Issues about Ecological Culture and Sustainable Environmental Development

#### 2.1.1. Concept of Ecological Culture, Sustainable Environmental Development

*Concept of culture* is considered by scientists in various aspects with more than 400 definitions on culture. From a philosophical perspective, “*culture is understood as the whole material and spiritual values made by human in the historical and social practices and it represents the achievements in the history of social development*” [[23]; p.656]. *Concept of ecology* in Greek is “*oikos*”, understood as house, residence, habitat of creatures from the smallest to the largest and it is also human environment. Ecological environment is also called natural environment, habitats or houses of species, including all surrounding conditions related to life of the organism. The factors in the ecological environment exist in dialectical relationship, operating according to rules of objectivity, forming the rules of operation and development of ecology. Author A.A. RaDuGhin emphasized ecological culture as an expression of the relationship between human and nature, “*Culture gradually takes the relationship with nature as its object, ie the appearance of the culture of human ecological activity, or as it is said, ecological culture. The mission of eco-culture is to raise assessment of the relationship between nature and human to a new level, bringing knowledge of this relationship into the system of cultural values*” [[24]; p.133]. In the works “*Theory on cultural*

*change - methodology of multilateral evolution*”, J.Steward wrote that “*Find the cause of cultural change and try to propose a method of recognizing the ways that cultural change is caused by environmental adaptation. This adaptation is called ecological culture*” [25]. Thus, ecological culture is a science that researches on ability to adapt to environmental conditions through practical activities of human, forming manner with and adjusting relationship of human and ecological environment. In relationship with the nature, people need to be aware of and respect the objective rules of living of ecological environment in order to adapt to the ecological environment. Human adaptation to that ecological environment is considered ecological culture.

Approach to concept of ecological culture indicates its forms of expression with material and spiritual values that are the creative result in the practical activity of human in a harmonious relationship with nature, author Tran Le Bao supposes that “*Ecological culture is all material and spiritual values made by human in the process of affecting and changing natural world in order to create a better, clean and harmonious living environment towards right things, the good, the beauty for the sustainable development of society*” [[1]; p.196]. In particular, intangible ecological culture is ecological ethics, ecological lifestyle, customs, beliefs...expression of human behavior to the ecological environment. Agree with that view, author Vu Minh Tam said that: “*Ecological culture is the whole value that people achieve in the process of natural change in order to create a new living environment that is both in line with human nature and social development, and essence of existence and development of nature*” [[26]; p.4].

Some other researchers approach in the aspects of ecological culture as the creation of social and cultural values of human, expressed through their perception and behavior to nature in practical activities. “*Ecological culture is all social and cultural values expressed in the behavior, behavioral impact and natural changes in order to create a suitable living environment that meet the needs for a healthy living, human development and advancement. Ecological cultural values are all values created and built by human in the life, activity and development in the natural world - in the ecosystem*” [[15]; p.34]; or “*Human ecological culture is understood that it is expressed clearly in the human consciousness and attitude in the process of taking advantage and transforming the natural world to serve their live*” [[27]; p.87].

Thus, regarding the concept of ecological culture, the researchers all suppose that ecological culture is an expression of the relationship between human and nature through creative practical activities on the basis of respecting nature in a harmony way, towards the values of truth and goodness. *Ecological culture is a manifestation of the relationship between human and nature, which shows the capacity of human to conquer nature, expressed through human knowledge, love and action in practical activities, thereby creating material and spiritual values on the basis of respecting ecological environment.*

#### 2.1.2. Concept of Sustainable Environmental Development

From point of view of dialectical materialism, “*development*” is a concept used to refer to process of

movement of things with tendency to rise from a low level to a higher one, from less perfect to more perfect. It is not simple only a increase or decrease in quantity but also a qualitative change in an increasingly perfect way. "Sustainability" can be understood as an attribute, a qualification that expresses the long-term existence of things. It does not mean immutability, eternity but it is in continuous movement that is permanent. *Sustainable developmentis* understood as movement of things with increasingly complete tendency and helps that object to exist permanently. The sustainable development mentioned in this study is the sustainable development of a society. Accordingly, a developing society must be a society where people as well as their living conditions are increasingly enriched in all aspects: from material life to spiritual life, from daily life to the conditions of living environment,...It can be seen that social development is understood as a process in which economic development bring higher material welfare; cultural, political, and social development bring higher spiritual satisfaction. Thus, *sustainable developmentis* considered as the process of movement of society with increasingly developing tendency of resources, so that the living quality conditions of human is guaranteed and more and more enhanced.

*Sustainable environmental development*: "is the socio-economic development in association with protection and improvement of natural environment. Social development is without destroying environment, damaging ecological balance, and harming ability to meet the demand for enjoyment of natural resources and environment of future generations. In the process of development, human must know how to exploit and use rationally and economically natural resources; protect, care, regenerate natural resources, environment; maintain ecological balance and biological diversity; minimize natural destruction and environmental pollution. In development planning options, special attention should be paid to the interactions between human and nature" [[28]; p.59]. Therefore, *sustainable environmental development* is to harmonize human-nature relationship: rational exploitation, economical and effective use of natural resources; effectively prevent, prevent, handle and control environmental pollution; protect national parks, natural conservation zones, biosphere reserves, biodiversity; overcome degradation, protect, improve, restore and regenerate natural resources and living environment.

### 2.1.3. The Impact of Ecological Culture on Sustainable Environmental Development

#### 2.1.3.1. Ecological culture is the basis for determination of sustainable environmental development

Ecological culture is a manifestation of human - nature relationship, it expresses the knowledge and understandings of human on objective principles in the natural world and application of those in practical activities, at the same time represents human love and behavior for nature. Ecological culture is a basic condition that raises human awareness for objective-principle issues, eg relationship between human and nature, and it becomes the basis to adjust their practical activities provided that they respect, love nature and firmly protect the ecological and natural environment, which is the basis for our own existence, absolutely not opposing and exploiting nature. This requirement set foundation for point of view on coexistence and

development of human and nature. Because of survival, human inevitably renovate and exploit nature to make wealth, meeting the physical and spiritual needs for themselves and society. But human cannot violate the survival of natural world, exploit naturally inexhaustible things leading to poverty, exhaustion of natural resources for their own purpose only, because natural world - human and society are united in materialism and historical co-evolution.

Currently, developing countries including Vietnam are in the course of industrialization and modernization with trend of expanding social production in both width and depth, leading to risk of environmental degradation, pollution and crisis, and all humanity are now facing up with negative impacts of climate change. On the basis of ecological culture construction, the environmental risks are also solved. Through the basic values of ecological culture as the norm of ecological ethics, good human customs for nature will create a healthy ecological lifestyle for human, thereby having a sense of care and protection of surrounding living environment. Ecological lifestyle will help all elements in the ecological environment: soil, water, air, resources and animals and plants are protected, and ecological balance is guaranteed. Living in high ecological culture conditions, eco-consciousness of human is increasingly improved. They understand that people cannot treat nature like exploitation or appropriation, whereas humans must do like nature is an indispensable partner in the process of survival and development.

Today, the rapid development of modern science - modern technology revolution facilitate to improve the quality of human life, but it also has certain negative aspects affecting the natural environment. They are phenomenon of resource exhaustion, ecological imbalance, polluted living environment, which has directly affected the survival of all life on earth. That is the cause of environmental problems: environmental degradation, environmental pollution, environmental crisis, climate change... In the face of this situation, ecological culture will contribute significantly to minimize environmental issues to the fullest extent for ecological environment.

#### 2.1.3.2. Ecological culture becomes the motivation and target for sustainable environmental development

Ecological culture equips knowledge about dialectical relationship among people - nature - society for social subjects. All of human activities is the regular "metabolism" process between human and nature, K.Marx wrote: "People live by the natural world, it means that the natural world is the body of human, that must be in the process of regularly communication to survive" [[29]; p.137]. Human - ecological environment is a unified dynamical system that needs to be balanced at a certain level and the components in that system are both affected by and affect each other. This is a system that works based on principle of opposite relation, not only one-way relationship, which means that not only human has impact on natural transformation, but also nature do strong for human. It is noteworthy that this opposite effect is unpredictable, it can destroy all the first results that humans have achieved. Ecological culture helps to raise human's awareness on the important role of ecological environment for development, thereby human can be self-

conscious of “natural rules” and from that basis, they can “use those correctly” in the process of practical social activities. Because “we absolutely cannot dominate the natural world as an invader dominating another nation, as a person living outside nature, whereas, ourselves and our bones, blood and minds belong to the natural world, we are in the natural world and all our dominance over nature is unlike other creatures, that we are aware of its rules and can use those correctly” [[30]; p.655].

In human - ecological environment relation, human is a part of the natural world which is their inorganic body. Human need to be aware of essence and rules of movement of the ecological environment, thereby rationally applying, complying with the natural rules in the practical activities. Human is the subjects that take advantage of the nature according to existed objective rules but totally unable to dominate by themselves and take advantage of nature despite the rules of objective movement of the ecological environment. In the “*New Generation Knowledge Bookcase*” [31], Steven Pollock said that in relation to ecological environment, human plays a role in carrying out ecological balance, ensuring internal self-balancing of the ecosystem. The author has determined that the internal ecological balance must be considered as the central category of overall ecology, in which the ecosystem is given as a system of balancing material and energy and it acts as a flow of energy. This system balances when energy storage and energy regulation follow the rules of movement of the hierarchy in the ecosystems. In particular, ecological layers must exist in their natural state to balance themselves. Human are also in that ecosystem and co-evolution of human nature is also only available in the stability and balance of whole natural world. Therefore, human need to be aware of its role in implementation of internal ecological balance. Human need to be aware of the unified and dialectical laws in the material world, and understand that their role is the cognitive factor and apply the rules and implement natural ecological balance in practical activities. Conrad P.Kottak in the excerpt “*The New Ecological Anthropology*” [20] has affirmed that human is also a part of the ecosystem and promoted the cultural behavior of human to the ecosystem. In the article, the author mentioned that the issue of awareness on environment and ecology has impact on human and development of humanity.

The world is united in materiality, in which human is the most developed product in that world. The ecological environment and human belongs to a dialectical relationship that they contact dominate, impact and metabolize each other. Proper awareness of relationship between human and nature is the basis for individuals and organizations to positively identify practical activities in line with the rules of nature. “Environmental issues not only need to be analyzed from a scientific perspective but also a cultural perspective” [[32]; p.14], Greg Garad said. Because “what we do for ecology depends on our conception of the relationship between human and nature” [[33]; p.12]. When human understands essence of objective rules in the relationship among human - nature - society, with a positive sense, they will properly apply them in that relationship. “To improve the mountainous areas into a rich land and improve living conditions for local people,

as well based on energy and creative intelligence, cultural tradition... From adaptive capacity of ecosystem, human can change natural ecosystems” [[7]; p.36].

Therefore, it is an important to equip knowledge, raise awareness about the relationship between human - nature - society, thereby helping human to enhance the ability of operating objective rules in practical activities and becoming an important motivation for sustainable development of the ecological environment. Ecological culture expresses “a new thinking that human and society is not the lord of nature to stand outside, dominate and oppose with the biosphere, it is only a part of ecological cycle in the nature. In the course of social modernization, determination of human and social activities are restricted strictly by ecology at each period. Human, society and civilization can only operate in the “ecological corridor” defined at each specific historical period. If breaking that corridor, both human and society sooner or later will be “revenge” by the natural world [[15]; p.23].

From the vision of dialectical relationship in human - nature relationship, even though human takes advantages of nature to pursuit of life, they must have a common sense to live and attach with the natural world in a harmony manner, preserve, protect and bring up nature, keep ecological unity as a primary mission and target for human development. The right awareness of the ecological environment and consideration of ecology as a cradle of human life and humanity development will form a behavioral culture, an ecological lifestyle of respecting nature, and regulates practical actions of human in relation to nature. Because they understand that: “Despite bleeding natural world dry for true needs of life leading to violation of natural life, it is the opposite of the principle of human - nature unity, which is not only a lack of humanitarian and non-cultural behavior but also a suicidal act of human beings” [[15]; p.39].

Ecological culture equips knowledge to enhances human's awareness on the relationship between human and nature, fosters and looks after human love with the ecological environment, thereby forming a positive attitude and high responsibility together with the will expressed through moral affection and environmental protection actions in practical activities, creating a civilized, respectful and friendly behavioral model for environmental ecology for target of sustainable ecological environmental development.

## **2.2. Reality of Ecological Culture Impacts on Sustainable Environmental Development in the Northern Mountainous Region of Vietnam today**

### **2.2.1. Achievements**

Understanding the important role of ecological environment in the sustainable development in the region. In the strategy of sustainable development in the Northern midland and mountainous areas, “the Northern Midlands and Mountains are determined as strategic areas that are particularly important in the society-economy, national defence, security and foreign affairs of the whole country, play an important role in the ecological environment of

the whole Northern region” [[34]; p.65]. Construction of ecological culture is one of the basic conditions to ensure sustainable development in the northern mountainous region today. Ecological culture has made an important contribution to the sustainable development of the ecological environment in the northern mountainous region. Strategies for sustainable development in the Northern midland and mountainous areas, with the decision No.: 1064/QĐ-TTg on approving overall planning on socio-economic development in the Northern midland and mountainous region by 2020, of the Prime Minister, had important impacts on sustainable environmental development in the region.

The basic target of ensuring sustainable development in the region is: to combine socio-economic development with environmental protection. Specific targets on environmental protection include: Socio-economic development associated with ecological environment protection, rational exploitation and protection of natural resources; limit of pollution and environmental incidents; improvement of forest coverage to 50% by 2020; implementation of policies and laws on forest protection and development associated with sustainable poverty reduction. The localities in the northern mountainous areas implement forest protection and development in combination with sustainable poverty reduction and increase of forest area and coverage throughout the region.

According to forest status by December 31<sup>st</sup> 2016 distributed by localities in the Northern mountainous region, the total forest area of the whole region is 4.310 thousand ha (accounting for 30% of total area of the whole country), in which area of natural forest is 3.382 thousand ha (accounting for 33% of the whole country), the area of plantation forest is 942.8 thousand ha (accounting for 22.8% of the whole country), the average coverage rate is 54.9%. The preliminary area of newly plantation forest in the whole region in 2017 is 64.7 thousand ha (accounting for 26,8% of new plantation forest area of the whole country) [[35]; p.521]. The target by 2020 that most urban and rural residents use clean and hygienic water has increased the rate of households using clean water in the whole region by 2017.

Percentage of households that are supplied clean water in several northern mountainous provinces.

No.	Province	2016 %	2017 %
		Whole country	93.0
	Northern mountainous midlands	81.3	-
1	Ha Giang	81.8	83.7
2	Tuyen Quang	87.5	87.5
3	Yen Bai	55.85	56.17
4	Lai Chau	70.02	75.81
5	Lao Cai	72.72	74.54

Source: [[36]; p.390], [[37]; p.412], [[38]; p.257], [[39]; p.479], [[40]; p.518] and [41]

However, in comparison to the whole country, the percentage of households using clean water is still low and in comparison to other regions in the whole country, the Northern midland and mountainous region has a lowest

proportion of households using clean water throughout country. In 2016, it reached 81.3%.

Next, indigenous knowledge with important values that form ecological culture is a highlight reflecting the important role of ecological culture in the sustainable environmental development of the northern mountainous region in Vietnam. The indigenous knowledge of the northern mountainous residents demonstrates the philosophy of living in harmony with and loving nature, that always go with wet rice civilization; method of general and dialectical thinking based on experience knowledge; the spirit of patriotism and high sense of ethnic community; lofty human spirit, an affectionate and tolerant lifestyle; labor love, high appreciation of labor and achievements, industrious, simple, frugal and economical life.

### 2.2.2. Current Status of Degradation and Environmental Pollution in Mountainous Region of Northern Vietnam

*Water resources are degraded and polluted:* Cao Bang province is also facing up with serious polluted water due to waste from mineral mining and processing facilities and illegally gold and sand digging and exploitation which has long been an evil for has serious environmental devastation. In addition, the averaged waste water flow leaked from the waste landfill sites in the province is 5 - 20 m<sup>3</sup>/day, with pollution radius from 200m-300m. Because most of landfills in the province have no system to collect and treat overflow waste water, rainwater in accordance with regulations. This is one of the very serious causes of water pollution. Currently, in the province, the phenomenon of discharge of industrial, medical and domestic wastewater into the river without treatment with large quantity occurs. Typically, Bang river and Hien river receives nearly 7.000 m<sup>3</sup> of domestic waste water and over 2.000 m<sup>3</sup> of industrial wastewater. Meanwhile, this waste water source contains total suspended solids (TSS), biochemical oxygen demand (BOD<sub>5</sub>), chemical oxygen demand (COD) many times higher than Vietnam standards for permission. The results of surface water analysis on Bang river in Cao Bang town have a TSS index of nearly 5 times higher than the permitted standard, and 2-4 times for BOD<sub>5</sub>... The water source of Hien river is polluted severely due to upstream mining activities [42].

In Ha Giang and Tuyen Quang Province, according to test results of Department of Northern Mineral Control in 2017, 4 of 6 mineral mining companies in Ha Giang province have tested water samples exceeding QCVN values; 8 of 11 mineral mining companies in Tuyen Quang province have samples exceeding QCVN values. Excessive indicators are mainly TSS, BOD<sub>5</sub>, COD and heavy metals such as Zn, Mn, Fe and Hg [[43]; p.93]. In Ha Giang, the reality of water pollution is serious: In term of waste water and landfill waste water: through the results of 02 monitoring periods, value of BOD<sub>5</sub> content in the landfill waste water sample in Ha Giang city exceeds the permitted limit under QCVN 25:2009/BTNMT- National technical regulation on landfill wastewater [[44]; p.48]; values of BOD<sub>5</sub>, COD and Coliform content in sample: slaughterhouse wastewater of Group 1, Minh Khai ward, Ha Giang city exceed the permitted limit under QCVN40:2011/BTNMT - National technical regulation

on industrial wastewater [[44]; p.48]. *Medical waste water*: Through the results of 02 monitoring periods, value of Ammonium (NH<sub>4</sub><sup>+</sup>) content in the NT7 sample exceeds the permitted limit under QCVN 28:2010/BTNMT - National technical regulation on wastewater medical [[44], p.48-49]. *Surface water source environment*: Through 02 monitoring periods, it indicates that the values of BOD<sub>5</sub>, COD and grease analyzed in the NT1 sample exceed the permitted limit under QCVN 08MT:2015/BTNMT - Technical national regulation on Surface Water Quality [[44], p.49]. *Underground water source*: Through 02 monitoring periods, the total value of Coliform content in some groundwater samples in Ha Giang province exceeds the permitted limit under QCVN 09-MT:2015/BTNMT - Technical national regulation of underground water quality, namely: Stage 1: the NG1, NG4, NG5 sample exceed 1.3 times, 7.66 times and 3 times, respectively; Stage 2: NG1, NG2 and NG4 sample exceed 2.667 times, 5 times and 2 times, respectively [[44]; p.49].

In Dien Bien Province, there are 3 of 17 analytical samples that have measured results exceeding the permitted standard QCVN 08-MT:2015/BTNMT, the COD exceeds 1.24-1.57 times [[45], p.5]. For BOD<sub>5</sub>: there are 4 of 7 analytical samples with measurement results exceeding the permitted standards, higher than permitted concentration from 1.28 to 1.75 times [[45]; p.5]. The total suspended solids TSS at 17 monitoring points show 8 of 17 results exceed the permitted standard from 1.25 to 2.46 times [[45]; p.5].

#### *Polluted air environment:*

At present, in face of rapid development of urbanization and industrialization, the air environment get risks of being polluted and even seriously polluted in somewhere. Construction of hydropower projects, construction material production facilities of discharging dust, transport development, etc are important factors causing air pollution. In rural areas, pollution is caused by poor sanitation and poor technical infrastructure. The unreasonable use of agricultural chemicals (chemical fertilizers, pesticides) has been making the environment polluted. The development of handicraft villages and backward production technology, small production scale, no equipment for collecting and treating waste in processing facilities in some areas caused heavy air pollution, especially in villages where recycle metal, plastic, produce paper, fire brick and tile, crockery, etc. According to report of the Cao Bang Committee for Ethnic Minorities, the atmosphere in Cao Bang is increasingly polluted. The reason is mainly due to operation of factories which discharge an enormous source of carbonic, acids, gases into the atmosphere causing greenhouse effect. Besides, dust of different vehicles, construction works, mineral exploitation areas, garbage dumps without satisfying prescribed standards and other types of engines made living environment get polluted and directly affected health and life quality.

In Lao Cai, emissions generated from traffic activities and industrial production activities, especially chemical industry, production of fertilizer and steel (mainly distributed in Tang Loong industrial zone) are main source of air pollution. According to the statistical survey, the total current emissions generated at the factories in Tang Loong industrial zone are about 1.7 million m<sup>3</sup>/hour, the main emission components are SO<sub>2</sub>, NO<sub>x</sub>, acid vapor, the

emissions are mainly on the following factories: DAP No. 2; Lao Cai iron and steel, Lao Cai copper processing; Factory of fodder production (DCP); Factory of manufacturing acid extracted with 100,000 tons per year and TSP-rich phosphate production plant with 100,000 tons per year of Lao Cai Chemical Fertilizer Joint Stock Company and factories of producing yellow phosphorus. On September 7<sup>th</sup> 2018, the waste reservoir of Tang Looong DAP No. 2 in Industrial Park was broken, causing 45.000m<sup>3</sup> of hazardous waste overflow into households and the environment.

#### *Causes of inadequacies in environmental pollution*

*Firstly*, Human awareness of environmental impacts is still limited, so in the process of economic development that is not concerned with environmental issues, making the ecological environment in the northern mountainous region decline and serious pollution. "One of the most pressing humanitarian cultural issues in our country today is the awareness of the environment and the protection of the ecological environment of the people, even the social managers at all levels low. To be more precise, the ecological consciousness and ecological thinking of Vietnamese people have so far been mainly at a low level, the level of small producers, cultivation of wet rice (small farmers) is universal turn in the whole society [[12]; p.24]. This is the reality and at the same time is an important cause of negative consequences for the ecological environment in Vietnam today.

*Secondly*, about management organization system: The system of central environmental management organization is relatively synchronous, from the former Ministry of Science, Technology and Environment, now the Ministry of Natural Resources and Environment to departments, research institutes and institutes at local ministries and departments. All provinces and cities in the country have departments, branches, companies or equivalent units managing and implementing the task of supervising and enforcing environmental protection laws. These units are the core force, direct to ensure environmental quality in the locality. However, the environmental management system is still inadequate, the organizational structure of management is not commensurate with the tasks set.

In the process of making plans, programs and projects, socio-economic development planning environmental protection has not been given due attention. The capacity of functional agencies on management, protection of natural resources, environment and sustainable development is still weak, failing to meet the complicated tasks of the actual situation. Violation of the law on natural resources and environment protection is quite common and serious but the number of cases detected and handled very little or not strictly handled reduces deterrence and ecological culture education. The investment and use of economic leverage in environmental protection for sustainable development are still low. Violation of the law on natural resources and environment protection is quite common and serious but the number of cases detected and handled very little or not strictly handled reduces deterrence and ecological culture education. The investment and use of economic leverage in environmental protection for sustainable development are still low.

Regarding the system of legal documents on environmental protection, there are many shortcomings,

the law on environmental protection and the laws related to environmental protection are not synchronous. Legal documents in environmental protection still exist: the system of legal documents on environmental protection is both redundant and lacking and is not really suitable to the conditions of the market economy and international integration in the context of globalization. Many documents under the law are left open and overlapping, there are many important regulations, such as environmental protection tax, environmental audit, detailed regulations on insurance for compensation for environmental damage, lack of Specific policies to encourage environmental industries, socialize environmental protection... Besides, the stability and scope of regulation of the elasticity of regulations on environmental protection are not high. There are new documents that have been issued not long before that have to be revised, supplemented or withdrawn. In the law on environmental protection, there are no regulations that strongly threaten acts of causing serious environmental pollution, causing economic damage and public health affecting the sustainable development goals... The Law on Environmental Protection of Vietnam also carries a temporary administrative sanction, warning, not effective enough to regulate violations of environmental protection laws of economic entities.

The environmental management in the locality has not been concerned by all levels and concerned sectors, the environmental management capacity of local officials is still limited. Leaders of local branches and levels advocate the attraction of investment capital for economic development, prioritize economic development, but underestimate the ecological environment issues. Implementing the goal of industrialization and modernization, the provinces "call for" investment, but there is no computation and binding on environmental protection responsibilities for economic entities. In the process of industrialization, industrial parks and factories have been continuously opened massively, but only about 10% of industrial parks have environmental treatment systems; many places have not yet implemented, using the right fund for 1% of the state budget expenditure for the environment. Enterprises applying to industrial parks all have the full promise of environmental impact assessment, but few businesses do not have the supervision of the heads of departments or protection agencies local environment.

It can be seen that the issue of ecological environment protection has just stopped at the guidelines, policies and documents promulgated, not really going into the production and business practice and becoming an action for every economic owner and environmental management staff.

*Thirdly*, Ecological culture in the business of enterprises, the owners of production and business households are still limited. Conscious of implementing the State's guidelines and policies on environmental protection of enterprises, the household heads are not high. Enterprises and people "avoid" environmental problems. Enterprises implement commitments, responsibilities, and provisions of environmental protection laws that increase production costs. By investing in science and technology capital using modern production technology to save fuel, using renewable energy sources, investing in technology to treat environmental emissions... implementing oranges

environmental results create a source of extra-production costs that reduce the profits in business production of entities. Therefore, they avoid implementing commitments, the provisions of the law on environmental protection, even violating the law with the act of "stealing" into the environment.

The responsibility for environmental protection has not really become a culture in production and business as well as in the lifestyle for everyone in society.

*Fourthly*, the downside of industrialization, industrialization and urbanization is the inevitable trend of the development process. Many export processing zones, and concentrated industrial zones have low technology levels, many old and outdated equipment do not ensure that waste sources are treated and have great impacts on the ecological environment. Industrialization to promote economic growth, but economic growth in our country is still mainly in width, low growth quality, mainly based on labour, investment capital, material consumption and High energy, low efficiency, very negative impact on the environment.

### **2.3. Some Solutions for Ecological Culture Construction to Promote Sustainable Environmental Development in the Northern Mountainous Region of Vietnam Today**

*Firstly*, Implement economic development measures with a sustainable environment. Implementing regional development strategies should be built on the principle of minimizing the conflict limits between the economic system and the ecological system through the adaptation of economic objectives and how it affects its needs ergonomics, ensuring a balance between the need for economic growth and the need to protect natural resources and restore the environment. Linking environmental issues in strategies for socio-economic development planning, selecting economic development solutions associated with economical and rational use of natural resources, prioritizing the development of production industries to use and use renewable sources of environmentally friendly raw materials and fuels, environmentally-friendly production and application industries, using little raw materials and limiting emissions into the environment, encourage industries to produce green and clean fuel sources that are eco-friendly.

*Secondly*, apply economic measures in environmental management to ensure co-evolution in economic development. Studies show that environmental taxation is the most effective way to minimize environmental pollution and limit the degradation of natural resources and the natural environment caused by production and business activities... Taxing industries using coal and fuel such as gasoline and oil will have the effect of reducing emissions and increasing revenues for the state budget. Taxation will encourage business owners to invest in the application of modern technology in production, production use of clean energy sources such as solar energy, biomass energy... Conversion from income tax to consumption tax also brings practical benefits for environmental protection activities. Demand for luxury goods is on the rise, leading to stimulation of mining

activities to meet that requirement. And when consumption tax is higher, people will limit consumption, increase savings and if that saving is used for investment purposes so the growth rate will be boosted. The revenue from environmental taxes will be invested back to environmental protection projects. This form both has the effect of preventing and creating resources to overcome and improve the situation of environmental degradation.

*Thirdly*, perfecting the legal system in environmental protection. In parallel with economic measures, the environmental protection needs a strong and transparent legal system, ensuring strict sanctions, such as prohibiting the operation of umbrella production and business establishments serious environmental pollution, resolutely handle violations of environmental protection laws of organizations and individuals. In some developed countries, environmental protection laws clearly stipulate that violators are in addition to administrative sanctions, environmental polluters must also be responsible for re-creating the environment as before violation. In the environmental protection law of our country, there are regulations requiring violators to remedy the consequences, but how to overcome it does not have clear provisions.

In the trend of international integration, developing a global economy of environmental protection law of our country also need to complete the entire environmental protection law, complete the system of environmental standards and raising these standards to the standards of new industrial countries, so that our country's environmental protection laws are not only sufficiently deterrent but need to be compatible with international environmental protection law provisions. At the same time, in order to improve the law on environmental protection, it is necessary to have a compliment and complete synchronization of other laws related to the environment: Competition Law, Investment Law, Criminal Law... Criminal Law can allow any citizen or association, not necessarily the one who is directly harmed, to sue the ecological environment.

*Fourthly*, strengthening education and propaganda activities to build ecological culture, equipping environmental knowledge, impacts of ecological environment, ecological environmental pollution on community health, sustainable development... changing the perception of economic entities (micro and macro level), creating a shift in awareness of the ecological environment in economic activity, ending thinking, appropriating economic action, destroying the natural environment. Enhancing advocacy activities to mobilize community participation in ecological environment protection.

Strengthening the socialization of education on the ecological environment, providing information to economic entities about the role of the ecological environment, the impact of the ecological environment, the law on environmental protection ... to economic entities. Promote propaganda, dissemination and education of laws on environmental protection in order to raise awareness about environmental protection for organizations and individuals. Training on Environmental protection law for officials and propaganda widely available to people. Attention must be paid to education from sentiment, morality and aesthetics to civic responsibilities and obligations for environmental protection. Considering

environmental education and sustainable development is a long-term and regular task of the whole society. The education and training industry must incorporate environmental education into the national education system as an integral part.

*Fifthly*, must foster, train full-time officials, train and organize teams to investigate, survey, store materials,... Improve professional and professional qualifications for cadres and trainers with rules the contingent of people working in propaganda and volunteers aims to quickly bring environmental protection information and knowledge to the people, creating a shift from awareness to the behaviour of the whole society and construction. Ecological culture in the lifestyle of business and production culture of social subjects.

*Sixthly*, need to improve infrastructure, enhance the use of clean energy sources, wastewater treatment; innovating techniques and technologies for waste production and treatment, replacing obsolete technologies with modern technologies, clean technologies, saving natural resources and energy and being environmentally friendly.

### 3. Conclusion

The current, humankind is facing increasing ecological disasters, further study of the relationship between people and nature gives scientific theoretical bases, building essential development philosophy - ecological culture to ensure the sustainable development of humanity is essential. In Vietnam in the current period, some Northern mountainous provinces become bright spots in economic development, attracting foreign investment, rapid economic development speed. However, the region's natural degradation and pollution reality is posing important challenges to sustainable development goals. To ensure the goal of sustainable development in the northern mountainous region, set out requirements, grasp the concept of co-evolution between economics and natural environment, construct ecological culture, implement synchronous of the above solutions.

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