

# The system of Dykes and Water Resources of North Vietnam under the Impact of the American Air and Naval Attacks (1965 - 1972)

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## *1. Introduction*

Although the Vietnam War (1954 - 1975) ended more than 40 years ago, its historical factors still remain an interesting theme for scholars, however. Added to its political, military and diplomatic issues that have been researched for years, the other impacts of that war on social life and environment of both North and South Vietnam can be also seen as one of the central problems. Even during the warfare, public opinion and peace-loving forces around the world strongly opposed the use of dioxin and other defoliants scattered over South Vietnam to destroy enemy's refuges. This has seriously affected the ecological and human environment in those areas as well.

However, on the other hand, the American employment of air and naval forces expanded the war to North Vietnam after the Gulf of Tonkin incident (August 1964) to suppress the massive backing in both material and spirit to the South quickly become a matter of international interest. In addition to attacking military targets, the US air and naval forces also attacked transportation systems, irrigation facilities and sometimes public facilities such as hospitals. This was a serious threat to the economy, the life and safety of the people of North Vietnam at that time. Within the limited scope of this study, we can only attempt to analyse the effects of US air and naval attacks on dykes and water resource systems in North Vietnam, mainly in the Red River delta during the most intense period of the war from 1965 to 1972.

Our research results are derived from the exploitation of the archives and other holdings currently stored at the National Archives Centre III (Hanoi), and the newspapers published in North Vietnam during that time. Based on the arrangement, collation and statistics we will try to give a systematic and comprehensive view of the research issue. Besides, it is also

interesting to refer to the work of previous scholars as well as give us a complete and objective view on this interesting subject.

## 2. *The Role of Water Resource Systems in Eco-Social Life of North Vietnam*

### 2.1 *The Irrigation Situation of North Vietnam Prior to 1945*

For the ancient Eastern nations in general, the need for water has become an important precondition for promoting state formation. Born mainly in the river basins, the selection of wet rice cultivation as the main economic sector has required these countries to be particularly interested in irrigation. The first primitive state in the Vietnamese territory - the Van Lang state was formed on that basis. From the very early days, Van Lang residents have learned to take advantage of the tide's rise and fall to regulate the water supply for agricultural production.

Falling under the Northern domination period, the experiences of water management in the North has been gradually introduced into the country. By the 9<sup>th</sup> century, history books recorded the Cao Bien ordered people to embank dykes surrounding the city of Dai La to fight against floods. By the independence period, monarchies in Vietnam have been always aware of the role of irrigation for the survival and development of the country. In the official historical records of the dynasties, it is very common to see the reports of the flood situation, natural disasters as well as the response of the monarchies in each historical period. Under the Ly dynasty, when the capital was moved to Thang Long, the court paid particular attention to the construction of dykes to protect the capital. Because Thang Long is the place of confluence between the rivers, at the same time, the terrain surface is slightly low and flat so it is easy to accumulate water when floods occur. Experiencing the variation of history, subsequent monarchical dynasties were regularly interested in irrigation works, especially the embankment to prevent floods. With the expansion of the country's territory to the East and South, coastal embankments are also concerned to prevent saline intrusion affecting crops. Along with that, the regulations on flood prevention and dyke protection have gradually been documented in the laws of the state as well as the regulations in village conventions. The story of the embankment of water in the Red River delta took place until the Nguyen Dynasty ascended the throne and unified the country in 1802.

Originated in Tonkin, but after a long ruling and construction of the Southern part from a landless, deserted land into fertile plains, the Nguyen's Kings seemed too familiar with the method of water management by streams, and flood drainage of the South. Water management in the South concentrated on open canals to drain the floods, while in the North of Vietnam embankment is used as a major weapon to combat natural disasters. Therefore, during the early rule of the country, the Nguyen was embarrassed in the problem of water management in the Northern Delta. Keeping or maintaining dykes became a hotly debated topic that attracted the attention of imperial officials and localities. After a period of trial of both options, the Nguyen eventually returned to embankment to prevent floods.<sup>1</sup> However, the lack of unity and assertiveness of the Nguyen in the work of water management left a significant impact on the socio-economic life of North Vietnam and partly weakened the internal forces of the country in the course of resistance against the threat of French colonialism in the mid-19<sup>th</sup> century.

The Vietnamese economy and society changed dramatically following the policies of two French colonial exploitations in the early 20<sup>th</sup> century. At the same time, irrigation systems are also of particular interest in establishing infrastructure that attracts French capitalists to invest in the agricultural sector. This includes macro-level policies such as planting water-sheds to prevent floods, establishing reservoirs, and embankments. Even so, floods have still become a serious and permanent threat to the social life of North Vietnam at that time. According to researcher Pierre Gourou in his study entitled *Farmers in Tonkin Delta* in the first 30 years of the 20<sup>th</sup> century, dyke breakdowns occurred regularly around every two or three years.<sup>2</sup> The strenuous conditions of the farmers who protected the dykes and the attitudes of local authorities have been partly reflected in some novels also. Until 1945, the experience of water management of the Vietnamese people has a tradition of thousands of years, but that does not mean the advancement of technical level or the proud achievements of water management in this country. People still feel that dyke breakage and the risk of floods are still stalking, threatening the lives of people in the

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1 See also: Do Duc Hung (1997): *The Problem of Water Management in the Northern Delta in the 19<sup>th</sup> Century under the Nguyen Dynasty*. Hanoi.

2 Pierre Gourou (2003): *Farmers in Tonkin Delta, Vietnamese Association of Historical Sciences*, École française d'Extrême-Orient. Hanoi. 79.

Red River delta. Additionally, it should be noted that this is not the main cause of the famine in Vietnam in 1945.

## 2.2 Water Management in the North of Vietnam from 1945 to 1965

The days of August 1945 not only left a mark on the hearts of the Vietnamese people because of the boom of *August revolution* but also unforgettable memories of the historic flood in Northern Vietnam.<sup>3</sup> And we also need to take note of the fact that, due to this flood, the orders of the Uprising Committee did not reach some localities and Vietnamese people in some places have actively acted according to the previous order named *Japan - France Shooting and our actions* issued by the Standing Committee of the Central Indochinese Communist Party to rise up the insurrection and seize power. The floods severely affected the dyke system that paralyzed the intersection system, causing the revolutionary leadership of the revolutionary headquarters in the Northern mountainous midland provinces to face many difficulties:

“After Japan declared surrender, due to rising floodwaters, the dyke system in Red River delta was ruptured in many places causing flooding in many provinces in the delta. Due to the interruption of communication, most of the provinces in this area did not receive the order of general uprising from Tan Trao.”<sup>4</sup>

Right after the success of the *August Revolution*, the revolutionary authorities were built up in different provinces. One of the central problems of the revolutionary government at the time was to overcome the aftermath of the historic flood and to consolidate the dyke system. On October the 11<sup>th</sup>, the provisional government held a plenary session discussing on dyke reinforcement by spending its treasury and calling for contribution and labour to mend the dykes before the flood season of 1946 came.<sup>5</sup>

As we can see, right after from the very beginning of the newly established government of the Democratic Republic of Vietnam, the state leader Ho Chi Minh quickly embarked on overcoming the aftermath of the historic flood, at the same time, developed the dyke system in the Red River

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3 Phan Khanh/Tu Mao/Nguyen Gia Quang (1995): *Dykes of Vietnam*. Hanoi. 147.

4 Phạm Hồng Tung (2014): *The history of the August Revolution 1945 in Vietnam*. Hanoi. 199.

5 Phan Khanh (et al.) (2014): *History of Vietnam's Water Resources*. Hanoi. 249.

delta. However, until the end of 1946, when the nation entered the new resistance, the results of that water management course were not clear enough. The Ho Chi Minh government returned to the Viet Bac to lead the country's resistance. Therefore, water management in general and in the Red River delta was not in favourable conditions to be concerned.

In 1954, the signing of the Geneva agreement marked an end of the French War. The country was divided into two regions, and the 17<sup>th</sup> parallel was selected as the temporary boundary. In that situation, from 1955, North Vietnam carried out a three-year plan to heal the wounds of war (1955-1958) in which the prevention of floods and storms was paid special attention, for instance, "in 1956, the amount of embankment reached 17.735.000 m<sup>3</sup>."<sup>6</sup> However, the breakdown of Mai Lam dyke (Hanoi) still showed serious limitations of water management in North Vietnam at that time.

The 8<sup>th</sup> session of the National Assembly of the Democratic Republic of Vietnam in 1958 decided to split the Ministry of Water Resources and Architecture into two separate organs, the Ministry of Water Resources and the Ministry of Agriculture. Since then, the irrigation works in the North Vietnam have been upgraded. Preliminary many meetings on flood and storm prevention were regularly held. However, the work of dykes in the years 1958-1960 in North Vietnam has not really had countably breakthrough developments. In the first five years of the economic development plan of North Vietnam (1961-1965), the irrigation works were considered in the direction of more modernization and larger scale. Nevertheless, due to the fact that the state policies on irrigation have not been thoroughly grasped, the whole irrigation work in the North encountered severe problems.

Thus, it can be seen that, throughout the long history of the nation, water control has become an everlasting necessity of direct and substantial influence on the survival and development of the country, especially of the Red River delta. Governments that might differ in institutional terms, but they all regard irrigation as a key and frequently-cited task. However, the reality is that the water management in North Vietnam until the onset of US air and naval assaults was not systematically built up. Safety was guaranteed only in the narrow margin and quickly impotent to the abnormal

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6 Phan Khanh/Tu Mao/Nguyen Gia Quang (1995), 160.

nature. The problem of fighting floods seems to have been ingrained in the subconscious mind of the people in the Red River delta.

### 3. *The American Air and Naval Attacks in North Vietnam (1965-1972)*

Regarding the conspiracy of mass murder of the American imperialists, it is important to emphasize in particular the US's strategy to destroy the dyke system during the rainy season, in order to make millions of people die of floods and hunger. One American journalist, I.F. Stone criticized in his own independent newsletter called *I.F. Stone's Weekly* on July 12, 1965:

“bombing the huge dykes in the North of Hanoi would produce the same result as a hydro bomb; the entire area of the delta would be flooded, summer rice crops therefore would be destroyed, and then, from 2 to 3 million people would be drowned by the breakage of the dyke.”<sup>7</sup>

From March 1966, the chairman of the Joint Chiefs of Staff, E.G. Wheeler and top generals in the council made an appeal to expand an “open air war against North Vietnam” and directly mentioned the intention of destructing the dyke system that, as a result, would destroy the grain production.<sup>8</sup> In fact, US air and naval attacks in the years 1965-1972 severely affected the irrigation system of North Vietnam, which was originally vulnerable. In the economic term, the damage of dykes actually caused the abnormal agricultural production and affected the distribution of labor resources for production in many parts of the Red River delta.

From around February 1965 onwards, the US air force and naval attacks began with bombing operations near the demilitarized zone. The initial attack was limited to the south of the 20<sup>th</sup> parallel, which rapidly escalated to attack targets in all parts of Northern Vietnam. In 1966, the attacks gradually turned into targets of major cities and by 1967, the US air force attacked targets near the Vietnam-China border. The US focused on destroying the industrial and transportation facilities in the hope of destroying the economic and defence potential of the North, preventing the

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7 Cited accordingly to the Report on the Genocide of the American imperialists in North Vietnam by the Investigation Commission for the American Imperial War Crimes in Vietnam, October 1967. Records in the National Library of Vietnam, VL68. 00001. 7.

8 The Unforgettable American Crimes (1966). Hanoi. 148a.

North's relief road for the resistance of the people in the South. According to statistics from 1965 to 1968, US air and naval forces threw and dropped over 700.000 tons of bombs and more than 740.000 artillery shells in Northern Vietnam. In those bombings, the transportation system was hit the most with 94.561 arrivals, accounting for 52.3 percent of the total number of targets.<sup>9</sup>

Right from the first raids, dykes and irrigation systems soon became targets for the US air force. According to statistics, in 1965, US aircraft attacked irrigation works more than 500 times<sup>10</sup> and bombarded on the important dyke sections 78 times.<sup>11</sup> The pace of US air and naval raids continued to rise constantly. In 1966, the bombardment to destroy the dyke system was intensified and focused on the months of July, August and September when floodwaters rose. As of 1967, the US air and naval force had set more 368 additional targets, including 177 dykes, 48 dams, 18 pumping stations, 116 drains, 15 water troughs and 4 water reservoirs.<sup>12</sup> US air and naval forces targeting North Vietnam ended only when the Tet Offensive and some uprisings in the South Vietnam (1968) intensified and gained enormous results, forcing the US to sit at the Paris negotiating table to find a peaceful solution for Vietnam.

The attacks of the US air and the naval forces have severely affected the situation of irrigation in particular and the development of agriculture of the North in general. As mentioned above, despite efforts but in the context of economic difficulties and striving for unification of the country, irrigation works in North Vietnam did not significantly develop. The main water management measures are incidental, dealing with the incidents but

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9 The Steering Committee on Reviewing War under Political Bureau (2000): Vietnam's Revolutionary War 1945 – 1975: Victory and Lessons. Hanoi. 514 – 518.

10 National Archives Center III, Investigation Commission for the American Imperial War Crimes in Vietnam: A Criminal Investigation of the American Imperialists that Destroyed Irrigation Works and Dykes in Northern Vietnam from March 1965 to December 1966, Dossier No. 45, sheet 3.

11 National Archives Center III, Investigation Commission for the American Imperial War Crimes in Vietnam: A Criminal Investigation of the American Imperialists that Destroyed Irrigation Works and Dykes in Northern Vietnam from March 1965 to December 1966, Dossier No. 45, sheet 5.

12 National Archives Center III, Investigation Commission for the American Imperial War Crimes in Vietnam: Announcement No. 110 / UBDT of the Investigation Commission for the American Imperial War Crimes in Vietnam on the American Crimes in North Vietnam in 1967, Dossier No. 63, sheet 73.

not really a remote prevention solution. Therefore, the flood risk in the North is permanent, especially because of the complicated happenings of weather in North Vietnam during this period. As a result, the US air attacks on irrigation and dyke systems have made the problems of water management more difficult. A series of irrigation works and dyke sections must be repaired after each raid. As time went on, the US air force concentrated more on the focused targets, the recovery work thus required more efforts.

To a larger extent, agricultural activities in the North Viet Nam directly influenced by irrigation became more complex. It is historically reported that the farmer's yearly fruits were blown away after a major flood and this was still a topical event in Northern Vietnam in the 1960s. Therefore, during the period from 1965 to 1968, paddy production of North Vietnam had a certain decline from 5562 thousand tons in 1965 to 4628.6 thousand tons in 1968.<sup>13</sup> The area of rice cultivation in the North also declined from 2397.6 thousand hectares in 1965 to 2079.5 thousand hectares in 1968.<sup>14</sup> And then the yield of rice also dropped from 18.96 quintals per hectare in 1965 to 17.82 quintals per hectare in 1968.<sup>15</sup> This consequence is undoubtedly rooted in the weakness of the dyke system, which was heavily damaged during US air raids.

More seriously, the American bombings had a very serious impact on the daily life of the population of North Vietnam at that time. The number of casualties was constantly reported by the *Investigation Commission for the American Imperial War Crimes in Vietnam*. However, the cause of these casualties is not primarily from the direct bombardment of dykes and irrigation systems because of the following reasons: firstly, in the history of land exploitation, the people in the Red River delta have had less congregation, and formed the villages that cling to dykes and canals as commonly seen in the Mekong River delta. Villages are often located inside and relatively isolated from the dyke system to ensure the safety needed when an incident occurs. So, the effects of the American bombardment on the population and the daily life of people are relatively faint. Human casualties were mainly the people working with the maintenance and operation of irrigation works. Secondly, it proved true of course that urban ar-

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13 General Statistics Office of Vietnam (2004): Statistical data of Vietnam in the 20<sup>th</sup> century. Hanoi. 284.

14 General Statistics Office of Vietnam (2004), 286.

15 General Statistics Office of Vietnam (2004), 287.



eas, hospitals and schools, which are populated places, have been identified as early targets for air and naval bombardment in the North of Vietnam. Many evidences related to the US imperialist massacre of innocent civilians in the North of Vietnam were publicly noticed. However, this is a very interesting topic that will be discussed in detail in another study in the near future.

However, the attacks of American imperialists in North Vietnam in general had a certain impact on the lives of the people of the North at that time. A large number of educational institutions, hospitals and residents were forced to leave the urban areas and densely populated areas to evacuate to the countryside in order to live, learn and continuously fight. People in the areas where the dyke systems and irrigation works were attacked were mobilized to take part in dykes recovery work after the bombings ended and, in certain cases, there are human casualties when US air forces repeatedly attack critical dykes as a records proves:

“throw bombs to destroy dykes and irrigation works, then continue to raid to prevent them from being prepared repairs and killed the workers are tricks that the American imperialists often use... For example, on March the 23<sup>rd</sup>, 1967 they threw 52 bombs destroying three dyke sections, killing and injuring 30 civilians.”<sup>16</sup>

#### *4. The Fierce Bombardments in 1972*

North Vietnam gradually returned to normal socio-economic activities after the US declared a cease-fire in 1968. The people of Northern Vietnam made continuous efforts to restore and develop production in the following years. However, the historic flood in 1971 swept away previous achievements and posed a big question for the irrigation work in North Vietnam that year. The entire North was flooded; disaster recovery work took several months. This led to a decline in paddy output in the North in 1971 reaching 4920.9 thousand tons compared to 5275.9 thousand tons in 1970.

And when the battle on the diplomatic table became tense and went into a standstill, the military triumphs on the battlefield will help the party

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16 Report on the Genocide of the American Imperialists in North Vietnam by the Investigation Commission for the American Imperial War Crimes in Vietnam, October 1967. Records in the National Library of Vietnam, VL68. 00001. 8.

prove its true power. Parallel to the South Vietnamese Liberation Army's assault on Quang Tri, the US began to restart its escalation of attacks in North Vietnam in early 1972. However, the intensity and scale are noted to be much more intense. It seems that recognizing the heavy losses of the historic flood in 1971, the US air force focused primarily on the rapid attack on irrigation works and the newly constructed dyke system in particular. Between April and August 1972, the US air force carried out 198 times of attacks damaging 72 dykes and 35 irrigation works in Northern Vietnam.<sup>17</sup> Particularly, many dyke sections were attacked several times in a short period. It should be noted that, however, during the US air and naval attacks on North Vietnam, the irrigation system was not the only military target but destruction of the Northern economy also. In the last days of 1972, *in the final game*, President Nixon decided to select large populated cities as central targets in order to destroy the spirit and willpower of both the leaders and people of North Vietnam. Fortunately, the results were not what he had expected. In 1972 alone, the US air force and its navy threw about 210.000 tons of bombs in North Vietnam. Between 1969 and 1972, the US threw more than 650.000 shells and mines over this region. Consequently, the dyke systems were affected by these military activities.

It can be said that the impact on the dyke system in the 1972 offensive caused great consequences to the social life of the North at that time. Overcoming the aftermath of the war took place rapidly with the mobilization of great human resources. However, due to the mid-year attack, the yield of paddy in North Vietnam in 1972 still increased to 5742.2 thousand tons and it was not until 1973 did the new signs of decline appear. The output only reached 5190.4 thousand tons.

In total, between 1965 and 1972, US air and naval forces threw about 1 million tons of bombs in Northern Vietnam with about 872 471 artillery shells and mines. On average, each km<sup>2</sup> suffered about 6 tons of bombs, each person in the North at that time suffered 45.5 kg of bombs. The attacks killed and wounded 200.000 people, leaving behind 70.000 orphans. Additionally, 100 percent of power plants, 1500/1600 irrigation works in the North were attacked, more than 1 thousand critical dykes, 6 railroad tracks with most of the sluices collapsed leaving much damage to other

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17 People Newspaper, 25 August 1972. 2.

civil works. This left a huge impact on the people of North Vietnam in overcoming the consequences of the war.

Seen from a broader perspective, the American bombings targeting the dykes and irrigation systems severely affected the ecological environment of North Vietnam, especially agricultural eco-systems. As we might know, for traditional Vietnamese, water is a key element of agricultural production. Water control has become an especially important task in deciding the fruits of agricultural production. The US air force bombarded the dyke system, especially during the flood season, in fact, disrupted the irrigation system, which caused floods in many agricultural areas. Consequently, that caused also great damage not only to the economy but also to ecological environment. Many varieties of drought-resistant rice cannot grow when dykes break. In addition, flooding areas led to pollution of habitats and this was the direct cause of epidemic diseases such as cholera, and dengue fever. The American air force even took advantage of dry weather to destroy the environment as the case in Quang Binh province in 1966 when napalm and phosphorus bombs were thrown into rice fields that had been dried by American bombardments before.<sup>18</sup>

### *5. The Attitude of the Democratic Republic of Vietnam*

The government of the Democratic Republic of Vietnam took a great deal of action in responding to US air and naval attacks. The first move was to mobilize the entire population in bombed localities at all costs quickly overcome the difficulties and losses to resume production and fight against other possible attacks. In parallel with those drastic actions, authorities at all levels collaborated closely with the armed forces to build defensive battalions that protect the major irrigation and dyke systems. This was very practical in the legitimate defence of the Democratic Republic of Vietnam but invisible in general created the opportunity for US air forces to quickly defuse their misconduct by claiming that attacks on the dyke system and irrigation facilities are due to technical inaccuracies and that the irrigation and dyke system were too close to military targets. At a certain limit these defense are logic because due to the fact that at the

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18 Report on the Genocide of the American imperialists in North Vietnam by the Investigation Commission for the American Imperial War Crimes in Vietnam, October 1967. Records in the National Library of Vietnam, VL68. 00001. 9.

end of the winter of 1972, many US pilots chose to drop bombs at high altitudes, despite their inaccurate targets, but could avoid the multi-layered air defense network in Northern Vietnam. However, it cannot be denied that the destruction of the dyke and irrigation facilities was part of the US air strike plans at certain times.

The second move of the Democratic Republic of Vietnam government was to vehemently condemn and protest American criminal actions against North Vietnam in international forums. On July the 22<sup>nd</sup>, 1966, Prime Minister Pham Van Dong on behalf of the Government Council of the Democratic Republic of Vietnam signed a decree to set up a commission to investigate the war crimes of American imperialism in Vietnam. The Commission was responsible to:

- Investigate, collect, verify and compile documents as well as records on all aspects of the invasion of the US in Vietnam;
- Denounce the crimes of the American imperialism in Vietnam to public opinion in Vietnam and to the people in the world;
- Provide all necessary documents on war crimes of the US imperialists in Vietnam to agencies and organizations at home and abroad;
- Guide and coordinate activities with various state and social organs at all levels in investigating, compiling and preserving documents, exhibits on war crimes committed by the US imperialists in Vietnam.

During the course of its activities, the commission provided the international community with important images and evidences that proved the crimes of American imperialism in Vietnam. Of course, there are many valuable documents related to the US air force attacking the dyke system and irrigation works in North Vietnam.

Besides, the government of the Democratic Republic of Vietnam has been very successful in calling on the international community to condemn US air and naval bombardment actions in North Vietnam in general and destruction of the irrigation system in particular. International organizations investigating American war crimes in Vietnam were established and came to Vietnam to investigate and collect evidences. Many activists have voiced opposition to US war crimes in Vietnam. An English philosopher and pacifist, Bertrand Russel, for example, raised his voice about the American war crimes in Vietnam. In late 1966, followed by his initiative, the *International Tribunal for the Trial of American War Crimes in Vietnam* was established and two important sessions were held the following

year in Sweden and Denmark to condemn American crimes in Vietnam including the activities to destroy the dykes and irrigation systems.

In the conclusion of the first meeting held in Stockholm from 2 to 10 May 1967, air attacks directing towards civilian targets such as hospitals, nursing homes dams became one of the two focus points. Accordingly, “the court finds that dykes and other irrigation works were vital to the Vietnamese people and that there is a great risk of famine for the Vietnamese people by the armed forces of the US that plot to destroy those works.”<sup>19</sup> The court then came to conclude that

“the US government and armed forces are the culprits of systematic and large scale bombing of civil targets, including civilians, houses, villages, dams, dykes, medical facilities, leprosy nursing homes, schools, churches, pagodas, historical and cultural buildings.”<sup>20</sup>

Another activist, Professor Saburo Kugai, a Japanese intellectual, gave a speech on his field trip to Vietnam at the first session of the court in Stockholm “dams, ditches, irrigation works and coastal dams are bombarded systematically, especially during the rainy season from June to October.”<sup>21</sup> Another report by a French geographer of the University of Paris VIII, Professor Yves Lacoste noted his comments on the spot when he came to North Vietnam in July 1972 for a field trip as a commissioner of the *Third Corps of the International Commission for the Investigation of American War Crimes in Indochina* in which he exposed the genocide crimes of the American imperialists and their actions in North Vietnam. What he reported were the bombardments targeted towards the dyke network that was of vital importance to the Vietnamese people. Not satisfied with the destruction of factories, bridges, schools, residential areas, the US military forces also attacking the dykes in a hope to threaten the Vietnamese people or cause such great destruction that the Vietnamese people will have to kneel. Since April 1972, the bombardments were mostly located in lower areas like Hai Duong, Thai Binh, Nam Dinh and Ninh Binh, meaning not only the most densely populated areas and most productive in agricultural production but also where villages are clearly below river level. These vil-

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19 The world denounces and condemns the American war crimes in Vietnam (1975). Hanoi. 184.

20 The world denounces and condemns the American war crimes in Vietnam (1975), 187–188.

21 The world denounces and condemns the American war crimes in Vietnam (1975), 73.

lages will be submerged under water if the dyke breaks. He went further by showing the international public the maps mentioning destroyed dyke system and confirmed that the US air attacks must be precisely analyzed and well calculated. He concluded that those American war crimes marked a new phase of the American war in Vietnam: the destruction of vital geographical conditions of a country.<sup>22</sup> At the *10<sup>th</sup> World Festival of Youth and Students held at Humboldt University* (East Germany) in 1973, the Free German Youth released a declaration at the forum condemning the crimes of imperialism, especially the condemnation of war crimes committed by the American imperialists in Vietnam. It concluded that the American war crimes in Vietnam including bombing civilians, demolition of dykes, dams, genocide by chemical toxins must be punished exactly the same with what the Nuremberg trial in 1946 did with the war crimes under the Hitler regime.<sup>23</sup>

In Vietnam, calling for international support to side with Vietnam's position and strongly condemn the American acts were accelerated and brought more efficiency. The People Newspaper, the voice of the Workers Party of North Vietnam, was used as an effective tool in propaganda on this issue. Numerous articles strongly condemning the activities of the US air force's attacked on dyke systems were published. Some other countries like Cuba, Czechoslovakia, and Hungary continuously issued statements denouncing the activities of the American dyke offensive in North Vietnam, and organized demonstrations in support of the heroic struggle of the Vietnamese people.

## 6. Conclusions

Water management in the North of Viet Nam with the characteristic of dyke embankment has a long history and a great impact on social life. However, until the mid of the 20<sup>th</sup> century, the achievements of irrigation work in North Vietnam were not really prominent and thoroughly resolved the risk of flooding. In the strategic assessment and planning of war objectives, the US early saw the important role of the dykes and irrigation sys-

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22 The world denounces and condemns the American war crimes in Vietnam (1975), 158–160.

23 The world denounces and condemns the American war crimes in Vietnam (1975), 250–251.

tems in the economic and social life of Northern Vietnam and the focused to destroy them in the years from 1965 to 1972. The Americans soon realized that the economy of North Vietnam was mainly based on agriculture, of which irrigation is always a key issue. So, to hit the irrigation system is to respectively hit the agricultural economy of North Vietnam.

In addition, the urban formation alongside the rivers in Northern Vietnam has made it to be frequently exposed to the risk of flooding. Meanwhile, the dyke system in this area was only able to maintain the level of water stability, but not always safe enough when the incident occurs. So, attacking the main dyke system is to force the North permanently to face the risk of flooding. At a certain limit, the American military activities did not only aim at suppressing the economic potential of North Vietnam and hindered its assistance to South Vietnam but also really targeted at the spirit and will of Northern people, thereby to reduce the prestige of the Vietnamese Labor Party in the population.

To sum up, the attacks of US air and naval forces on irrigation and dyke systems in North Vietnam caused serious consequences. These consequences made the task of water management in the North Vietnam more and more difficult. The risk of floods and natural disasters become a frequent threat, and the agricultural production in the North was severely affected, resulting in a significant decline in production, area and productivity. This created a certain impact on the spirit of the Northern people, but could not sweep the will to combat spirit and production for the purpose of unification of the two regions of Vietnam.

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