TOWARDS SUSTAINABLE ARCHITECTURE
- HOUSING RESEARCH IN FLOOD-TYPHOON PRONE AREAS IN THE CENTRAL REGION OF VIETNAM -

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ABSTRACT

Floods and typhoons are natural disasters created by weather conditions. In recent decades, they have caused heavy damage to communities of the world especially to their housing. The Central Region of Vietnam is the area including fifteen provinces, which have suffered from floods and typhoons every year. These kinds of disasters are preventing sustainable development of the region and thus keeping its inhabitants mired in poverty. In order to step up preparedness and mitigation for these disasters, among the needed solutions, it is necessary to conduct comprehensive research to recommend housing measures that can resist floods and typhoons and appropriate to socio-economic condition in the region.

INTRODUCTION

Vietnam covers an area of over 331,000 sq. km, extending from north latitude 23°22 to 8°30 and from east longitude 120°10 to 109°21. Located in the humid tropical zone of the northern hemisphere, Vietnam is influenced by climates from both the ocean and the Sino-Indian continent. This natural position is one of the six largest storm centers in the world, making the country vulnerable to natural disasters. Especially the Central Region is in the most serious situation of this country.

FLOOD-TYPHOON DISASTERS IN THE CENTRAL REGION

Regional characteristic causing flood-typhoon disasters

Right in the central of the country, the location of the Central Region and its topography makes this region extremely vulnerable to natural hazards. The region has an area of about 97,000 sq. km, spreading over ten latitude degrees and is bordered by the sea to the East, and the Truong Son mountain range to the West. Located along the East Sea coast, this part of Vietnam is subject to typhoons and tropical depression from June to November every year. During the period from 1884 to 1999, the Central Region suffered from 75% of the total number of typhoons that entered Vietnam (³). In addition, because of the meteorological condition generated during the monsoon season, the Central Region is subject to heavy rains from September to December. The topography makes the provinces there particularly vulnerable to flooding. The years that saw the biggest floods were 1961, 1964, 1966, 1975, 1978, 1985, 1992, 1995, 1999, 2000 (³)(⁷)

The Truong Son mountain range runs parallel, in close proximity to the coast.
Therefore, between the mountains and the coast are the low-lying coastal plains that are repeatedly broken by rivers and streams that flow from the upland to the sea. When overloaded by rainfall, these waterways discharge their excess water into the floodplain as flash floods. In short, high mountains and large upland areas, relatively narrow lowland plains, many short, steep, gradient river systems, and long stretches of coastal sand dunes characterize this region.

The extent of damage by flood-typhoon disasters

The Central Region is vulnerable to almost all classes of natural hazards: typhoons, tropical depressions, monsoon rain, flash floods, landslides, drought and whirlwinds. These natural and often extreme weather conditions are not in themselves disastrous. Only when they affect human settlements and infrastructure or severely impact the environment do they become natural disasters. Among these disasters, floods and typhoons rank the worst and cause regular loss of life and economic damage. Numerous short and high gradient river systems flow through this coastal region. They deposit alluvial soil and provide water for life, turning the lowland into the most fertile agricultural land in the Central Region. Thus, the coastal plains are the most heavily populated part of this Region. So, when extreme weather events such as typhoons and floods occur, the impact on people, their agricultural lands and their houses is calamitous. Their development efforts are constantly set back, and thus they remain trapped in a cycle of poverty.

Due to these problems indicated above, the Central Region is the poorest area in Vietnam. Living in this place, the cradle of different national cultural movements of different times, the Central Vietnamese people are by all accounts industrious, hard-working and motivated. Their poverty is due in large part to their inability to sustain their socio-economic development because they have been repeatedly beset by natural disasters. These disasters destroy crops, inundate and sweep away houses, wash away personal possessions and destroy agricultural infrastructure. With a population of about 21.5 million and 80% of those people living in rural areas, the average per capita GDP of Central Region provinces is 240$US, equal to 60% that of the whole country. In summary, natural disasters deplete the basic resources needed to reduce poverty and to eradicate hunger.

Various support activities by the Government and international organizations

Both physical solutions and institutional strategies have been used in the long and rich history of Vietnam to respond to natural disasters. Over more than 2000 years, the Vietnamese people have developed elaborate systems to counter the threat of floods and typhoons. Physically, these systems include river dikes, sea dikes, flood diversion and control schemes consisting of dams, weirs, sluices and other facilities. Institutionally, the Government of Vietnam has developed complex systems to cope with the threat of floods and typhoons. At the local level, most provinces especially in the Central Region have active committees for flood and storm control. This is paralleled at the national level with the Central Committee and Flood and Storm Control (CCFSC) which includes representatives from different ministries, such as Agriculture and Rural Development, Planning and Investment, Construction and Transportation as well as Hydro meteorological Service, the Red Cross and even the Ministry of Foreign Affairs and People’s Army.

Apart from the effort of the Government, international organizations such as the United Nations, World Food Programme, and the World Health Organization have been helping the country in mitigating natural disasters. The United Nations (UN) has been providing assistance to Vietnam since 1974 and it declared the 1990s to be the International Decade for Natural Disaster Reduction (NDNR). To support the goal of NDNR, the United Nation Development Programme (UNDP) has been the leading international agency helping Vietnam to build national capacity to mitigate natural disasters. Based on the support of UNDP in 1992, in 1994 the Government of Vietnam produced the Strategy and Action Plan for Mitigating Water Disaster in Vietnam. UNDP has been assisting the Government in establishing projects, which aim to reduce human suffering and economic losses caused by natural disasters.

Yet these efforts do not seem to have been enough. They have mainly focused on development or redevelopment of infrastructures due to annual large damage, and had to cope with emergency food supply and partially material provision for temporary shelters in post-disaster situation. However they have hardly taken any measures of sustainable houses
which can empower local people elevate their quality of life.

NECESSITY OF MEASURES FOR HOUSING

In light of the frequent occurrence of natural disasters, housing in this region is always an important issue. During 20 years from 1971 to 1990, government statistics have recorded 660,857 houses collapsed and washed away due to floods and typhoons. The economic loss is estimated at thousands of million dollars annually. In addition, those who suffer most from floods and typhoons are usually in rural areas where population has naturally distributed itself, most of their houses cannot sustain the typhoon winds and floods. They do not have sufficient conditions to build permanent houses and instead use locally available building materials, which are simple and temporary for their houses. People still cannot find a suitable house that is appropriate for the natural and socio-economic conditions to thereby reduce deaths and suffering caused by floods and typhoons.

TOWARDS SUSTAINABLE ARCHITECTURE

To improve living conditions of people and create the sustainability appropriate to climate (resist floods and typhoons) of their houses, which are not at present sustainable, there needs to be comprehensive research to recommend measures of planning and architectural spatial organization. The measures should be appropriate to natural, socio-economic conditions, and custom and can be sustainable despite floods and typhoons of the region. These measures will fall within the realm of natural disaster preparedness and mitigation. It is not completely possible to prevent most natural disasters. On the other hand, natural disaster mitigation, the reduction of the effects of natural disasters on humankind and it’s housing, is often attainable. Therefore, the purpose of this research is to find measures that could mitigate the effects of natural disaster in the Central Region.

REFERENCES

Fig. 1 Submerged house by flood water

Fig. 2 Collapsed house by the typhoon

Fig. 3 Collapsed house by the typhoon

Fig. 4 Reconstruction after the disaster

Fig. 5 Damaged dike by flood water

Fig. 6 Affected natural environment

Fig. 7 Damaged bridge by flood water

Fig. 8 Rescue of victims during the flood