

**INFORMATION ON NEW ACADEMIC AND THEORETICAL CONTRIBUTIONS  
OF DOCTOR OF PHILOSOPHY THESIS**

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1. **Name of thesis:** *Study on the scientific basis and solution for flood drainage in Phan – Ca Lo river*

Code - Specialization: 62440224, Hydrology

2. **PhD student:** *Hoang Thi Nguyet Minh*

**Supervisors:** *Assoc. Prof. Dr. La Thanh Ha; Assoc. Prof. Dr. Hoang Minh Tuyen*

Training Institution: Vietnam Institute of Meteorology, Hydrology and Climate change

3. **Introduction:**

Phan - Ca Lo river is a tributary of the Cau river, flowing through the Vinh Phuc Province and Hanoi City. According to many hydrologists, Phan – Ca Lo is the typical river among Vietnam’s river systems because: 1) It takes historic vestiges of the first flood diversion river of the country; 2) It is one of the rivers having the highest meandering; 3) Although the Phan - Ca Lo is not a big river, it still flows through three zones having specific topographical characteristics: mountainous, midland and plain terrain; 4) The urbanization in the Phan - Ca Lo river basin is highly rated in the country; and 5) It has a complex irrigation and drainage area.

In recent years, natural disaster and flooding occur with increasing frequency and intensity, causing serious inundation throughout the Phan - Ca Lo river basin. In addition, Phan - Ca Lo river basin is located in the Northern key economic zone with speedy economic growth and urbanization; the upstream area positioned in Vinh Phuc Province is the Northern economic motivation region while the downstream located in Hanoi is the politic and administrative center of the Viet Nam. Therefore, the solution to dealt with flood drainage issue in Phan - Ca Lo river basin becomes more and more urgent.

**4. New academic and theoretical contributions of the thesis**

1) Clarify the characteristics of the Phan – Ca Lo river basin and impacts of human activities on the formation and development of flooding in the basin, subsequently establish a scientific basis for selecting and proposing appropriate solutions to drainage the floods;

2) Propose the feasible drainage procedures and control points in order to operate the system of flood drainage constructions in the basin, take it as a basis for planning of flood drainage in the Phan – Ca Lo river.

**Supervisors**

**PhD student**



**Assoc. Prof. Dr La Thanh Ha**

**Assoc. Prof. Dr. Hoang Minh Tuyen**

**Hoang Thi Nguyet Minh**