

HYDROLOGY AND WATER RESOURCES PHD PROGRAM AT VIET NAM INSTITUTE OF METEOROLOGY, HYDROLOGY AND CLIMATE CHANGE

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1. Achievements in PhD training

As one of leading national institution in Viet Nam, Viet Nam Institute of Meteorology, Hydrology and Climate Change (IMHEN) has been training high-level professionals for the country since 1982. It is considered as one of the best prestige training unit. The Institute is also the unique one in Viet Nam launching Climate Change and Sustainable Development PhD Program.

In 1982, Viet Nam Institute of Meteorology, Hydrology and Climate Change was assigned by the Government to provide post-graduate education and training professional fields including meteorology, climatology, hydrology and oceanography. In order to meet the increasing demand and requirement on education and training of other professional fields, IMHEN has been allowed by the Ministry of Education and Training to launch Natural Resource and Environmental Management PhD Program since 2011 and Climate Change and Sustainable Development PhD Program since June, 2014. By 2017, there has been 48 PhDs graduated from IMHEN in the fields of Meteorology and Climatology, Hydrology, Oceanography, Natural Resources and Environment. There are other 49 PhD candidates studying and researching at IMHEN. Graduated PhDs from IMHEN are highly qualified and meet the requirements of their agencies.

Currently, postgraduate training program at IMHEN has 28 faculty members, including 01 professor, 08 associate professors and 19 PhDs graduated both domestically and internationally.

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Most of them are leading experts in meteorology, hydrology, environment and climate change in Viet Nam. Faculty members of IMHEN are also participating in undergraduate and postgraduate training in meteorology - climate, hydrology, hydraulics, water resources, oceanography, climate change in other training institutions such as: University of Natural Sciences, Center for Environmental Resources Research - Viet Nam National University, Ha Noi University of Resources and Environment, Thuy Loi University, Ha Noi National University of Education, National University of Ho Chi Minh City, Da Nang University,... Besides, they are also participate in postgraduate training with international universities like: UN University (Japan), University of Cologne, University of Dresden (Germany), Asian Institute of Technology (AIT) (Thailand), Monash University (Australia),...

Hydrology and Water Resources PhD Program at IMHEN has a long training history Since 1980s, IMHEN has focused on intensive training in hydrological calculations, hydrological design, mathematical modeling and the application of new technologies and techniques in hydrological on water resources research. By the late 1990s, the number of PhD candidates in hydrology and water resources increased together with the expansion of professional fields. The quantity and quality of supervisors has been improved and many new research directions have been applied such as: reservoir operation system; forecasting and warning natural disasters; urban hydrology; river dynamics; applying of GIS and remote sensing in hydrology and water resources,...

In order to accommodate with the Viet Nam strategy for science and technology development, there is a demand to broaden

research topics for PhD education and link PhD training to scientific research. Additionally, there is a need to quickly reach the advanced level in the region, approach the topic of International Hydrological Programme (IHP) in each period.

Many new training fields have been established such as integrated river basin management, flash flood warning, developing decision support system, ecological hydrology; water economy, the impact of climate change on hydrology and water resources.

In order to accommodate with the training requirements, IMHEN has developed a system of lectures, courses, doctoral topics updated with the newest knowledge and information.

The system of reference books is supplemented as follows: Urban Hydrology; Flash floods; Impacts of climate change on water resources; River dynamics; Statistics in hydrology; River hydraulics; Integrated water resources management etc.

By 2017, there are 12 Hydrology and Water resources PhD candidates graduated and 6 PhD candidates studying and researching at IMHEN.

2. Strategic orientation

In coming years, IMHEN aims to remain as a leading research and training institution in Viet Nam in the fields of meteorology, hydrology and climate change. Therefore, IMHEN's PhD program need:

- To focus on updating training contents; to actively develop a mechanism for close coordination with agencies of the Ministry of Natural Resources and Environment for training. Training must be linked to the high demand of human capacity in industry as well as the society. A detail plan to broaden training fields at IMHEN need to be developed.

- To continue stepping up international co-operation in scientific research, technological development and human resource training; to strengthen the exchange and learning experiences from advanced countries in international scientific conferences and seminars to introduce and popularize scientific and technological research achievements of Viet Nam; to facilitate the support of international scientists to support research and solve problems in

Viet Nam. Studying and developing training cooperation models with prestigious international training institutions in order to raise the quality and training position of the Institute. This will provide access to the world's leading standards of academic education and the potential for collaborative research in the fields of hydrology. It also provides a platform for the exchange of professors and lecturers, which is a key activity in IMHEN's professional work. Inviting the hydrology and water resources leading experts in universities and training institutions in the world to participate in teaching and coordinating doctoral training at the Institute.

- To establish close relationship with IHP, follow IHP VIII topics in training.

- To improve facilities, libraries, computers, etc.

- To achieve these strategic objectives, Hydrology and Water Resources PhD Program will focus on specific criteria:

Advanced: To reach the training level of hydrology and water resources doctoral training program at some advanced training institutions in Asia and in the world;

Systematic: Inheritance, developing doctoral training program of the Institute, referencing and inheriting training programs in hydrology and water resources of other training institutions in country and abroad;

Interdisciplinary: Interdisciplinary direction with the fields of water resources, agriculture, environment,...

Inter-college transfer: The training program must be advance and inter-college transferable.

3. Conclusions

Hydrology and Water Resources PhD Program at IMHEN is being strengthened in accordance to the regulations of the Ministry of Education and Training. In order to improve the competitiveness of PhD training, it is necessary to attract high quality, enthusiastic and creative human resources. In addition, IMHEN's Hydrology and Water Resources PhD Program should focus on disaster prevention and mitigation, water resources management and other key professional fields to provide more knowledgeable researchers and skillful staffs on hydrology and water resources.