

# **Hanoi Urban Transformation in the 19-21<sup>th</sup> Centuries: An Area Informatics Approach**

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The project Development of Area Informatics: With Emphasis on Southeast Asia (FY2005-2009) aims to create a new discipline called “area informatics,” an approach that integrates the interdisciplinary field of informatics with area studies, which encompasses all academic disciplines, including natural ecology, environmental studies, human ecology, sociology, history, cultural studies, economics and political science. One of the core research topics of this project is the process of urban formation in Hanoi in the 19th and 21st centuries. This research aims to explain the history of urban development in Hanoi, which has been the capital of Vietnam for 1,000 years, and to digitize the research process and its results for publication.

To explain the process of Hanoi's urban development and transformation based on the hypothesis – *“Through the continual filling in of lakes and ponds formed by the riverbed of the old Red River, Hanoi achieved significant urban development and transformation during the Nguyen Dynasty period”* – generated by a historian Yumio Sakurai, research into this process was furthered through spatial analyses of various data gathered during the project, including maps, satellite images, cadastral map and historic ruins and vestiges, carried out using GIS (Geographical Information Systems) and RS (Remote Sensing) technologies.

The specific methods and procedures for proving the hypothesis are as follows. First, a broad survey of urbanization and transformation from the latter half of the 19th century through the beginning of the 20th century was undertaken. Second, the evidence for and substance of “significant urban development and transformation” must be investigated. To do this, (1) first a 1:2000 vector map that would serve as a reference was created based on maps and satellite images. Then GIS technologies were used to compare and analyze such features as buildings, levees and land cover in the period 1873-1936. In addition, (2) in order to look down and understand characteristics of Hanoi’s transformation on descriptions and events described in the cadastral document with corresponding to historical maps based on the viewpoint of spatiotemporal transition, it was necessary to accurately grasp the administrative classifications, especially village locations and boundaries that existed in the pre-colonial period and the French colonial period onward. An informatics approach including GIS technology and Network theory were attempted in order to restore the

provinces, districts and villages. Next, (3) the geographical and topographical environment and conditions required for a discussion of Hanoi's urban formation were investigated.

In this presentation, the analyses of Hanoi's urban transformation in the 19th and 21st centuries as described above with the main emphasis on the urbanized city, the water area, and the pre-colonial villages are discussed together with an Area Informatics approach.