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The confluence of water and power: water management in the Brantas river basin from the tenth to the sixteenth century CE
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Summary

The PhD thesis discusses the relationship between the central courts and local communities in the constructing and managing of water systems in the Brantas river basin between the tenth and the sixteenth centuries CE. Moreover, the study looks into what extend Java's specific *longue durée* conditions of topography and climate have determined these systems, exploring the temporal and spatial dynamics of the system. Nearby systems as existed in mainland Southeast Asia are compared with the systems in East Java. Although employing a comparative approach, the focus of this research is about East Java itself.

The primary sources that are used in my research are divided into two types of sources, namely old Javanese inscriptions and archaeological records. For the first group, around 80 such inscriptions have been studied, all of which relate to water management in ancient East Java and dating back from the eighth to fifteenth centuries. The second group of sources used are archaeological records. The archaeological remains I employ within this thesis are mainly found in the Brantas river basin, from its headwater to its delta, both in the highland and the lowland zones. The type of archaeological evidence includes canals, dams, reservoirs, tunnels, underground tunnels, ditches, wells, water pipes, water-spouts, as well as images shown by temple reliefs. These archaeological records were acquired through field surveys in 2016 (in Trowulan, Mojokerto, Sidoarjo, Pare, Kediri, and Malang) and through library research using academic studies, Dutch colonial reports, and related books.

An examination of ancient water management in mainland Southeast Asia is used to observe how a particular physical geography of river basins contributed to the shaping river-basin polities. A comparative approach was conducted by the method of cross-national comparison between ancient polities in Burma, Thailand and Cambodia at the one side, and in East Java at the other side. This method of comparison sought a better understanding of ancient water management in Southeast Asia. The exploration of water management in the said three regions of mainland Southeast Asia resulted in an affirmation of the assumption that the particular relationship between political power and water management is correlated with geographical characteristics, the state's economic base as an agrarian state, climate change, and the socio-political structure of the region.

The initial enhancement of the East Javanese water management was marked by the time when the Javanese political centre shifted from the Central Java to the East Java. The shift of the political centre triggered by a combination of a climate change and a volcanic disaster occurred around tenth century in Central Java. After the shift, the polity had to deal with new environmental challenges in the East Java, mainly because of the existence of Brantas river, although there was less instability than in Central Java. The basin of Brantas river where the political centres of the East Javanese kingdoms located from tenth to sixteenth century experienced dynamics of its hydrological systems which have evolved due to a variety of natural and anthropogenic influences, including changes in land and water use caused by human inhabitation, agriculture, climate change, modifications to water infrastructure, and water use.

On the basis of inscription records, the governmental system of East Javanese polity consisted of three levels, namely *kraton*—*watĕk*—*wanua*, or court—group of villages—village which in the system villages were autonomous. Moreover, the horizontal relations at the *wanua* level were much closer than the vertical relations between the *kraton* and the *watĕks*. Since a *watĕk* was a group of several villages, it was easy for the members of the *watĕk* to create networks and make horizontal connections. This system correlated with the water management system that the water management in the basin of Brantas river was influenced by the governmental system and naturally adapted its autonomous local authority. The East Javanese water management applied self-organizing principles of local communities as represented by local officials. Most water management activities, which are planning, constructing, maintaining, and securing infrastructure, were managed by local communities and local rulers. The responsibility for managing, maintaining, and securing were in the hands of local officials. The officials, such as the *hulair/hulu bañu*, *hulu wuatan*, *mananbañi*, *matamwak*, and *jukuñ*, worked for a local ruler such as a *rakryan* and so had the authority to control and regulate water resources and infrastructure. People surrounding the water infrastructure secured and protected water infrastructures from being destroyed by natural disasters or human action. The exceptions were occurred in two direct state interventions, in regulating logistics of water transportation and in securing agricultural land from a natural disaster. The motif behind these interventions due to avoid deprived revenues from transportation and crop taxes which might cause a shortage of liquidity.

The East Javanese Polities in the Brantas river basin should be considered a decentralized area consisting of scattered *watĕks* and villages. The research of this thesis strongly suggests that the East Javanese polities was perfectly able to control its realm by leaving the practical water management at the level of the *watĕks* and villages. By comparison to the polities of mainland Southeast Asia, the East Javanese polity merely oversees a political economy that was driven by the bottom-up initiative of local communities, so the East Javanese polity suggests and reflects a much more decentralized polity than the mainland Southeast Asian polities.