

Export-oriented Porcelain Economy in Song-Yuan China: Production Strategies, Networks, and Interaction at Dehua

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Export-oriented mass production is often associated with modern western economies, but similar production systems had already developed prior to the modern era. The emergence and development of the large-scale, intensive production of export porcelain in Southeast China during the Song and Yuan period (960-1368 CE) is considered to be one of the most conspicuous examples of the export-oriented economies in the premodern era. Evidence of mass production abounds in southeast China in the forms of massive dragon kilns. The products of these kilns have been widely discovered in ancient shipwrecks and terrestrial sites along ancient maritime routes. Despite the existence of large-scale, export-oriented mass production and the widespread of Chinese porcelains all over the world, the study of porcelain production in southeast China has yet to be incorporated into anthropological and archeological comparative studies of craft production and specialization. Current research on porcelain production in China primarily focuses on the chronological study of porcelain products under a culture-historical framework. These studies often use the production region, which refers to a cluster of kilns located within a specific geographic area (usually the area of a county), as an analytical unit and regards the few excavated kilns as “representative” for the whole region. Little research has yet to be conducted to document the relationships and interactions between kilns within a production region.

This project focuses on porcelain production at Dehua, a county located in an inland mountainous region of Quanzhou in southern Fujian in southeast China. Along with the expansion of maritime trade networks and the development of Quanzhou as a maritime trade center during the Song and Yuan dynasties, Dehua quickly emerged as one of the premier production centers of export porcelain. The prosperity of porcelain production at Dehua even attracted the attention of foreign travelers, such as Marco Polo, who mentioned a city near the port of *Zai-tun* (Quanzhou) called *Tin-gui* (possibly Dehua), where fine and cheap porcelain wares were manufactured in large quantities. Archaeological surveys at Dehua have discovered a total of 42 kiln sites dated to the Song and Yuan periods. These kilns were enormous in scale as well, with the evidence of the Qudougong *dragon* kiln being over 57 meters long.

Rather than just looking at porcelain products from the few excavated kiln sites, this research aims at examining the production networks and technological interactions between kilns at micro levels. By investigating ceramic products and kiln furniture from 19 kilns at Dehua, this project seeks to answer the following questions: (1) How connected was porcelain production at Dehua? Were kilns highly connected with each other or highly isolated in terms of ceramic-making technologies? (2) How centralized was porcelain production at Dehua? Were kilns in a non-hierarchical production network, or certain kilns emerged as centralized kilns by controlling key resources or technology? (3) Was there any localized production community at Dehua? If so, what factors may contribute to the clustering? To identify patterns of interaction between kilns at Dehua, this research adopts a social network analysis (SNA) approach. Kiln sites are considered as actors (“nodes”), and the connections (“edges”) between them are measured based on inter-kiln similarities in stacking techniques and glaze recipes. A guiding premise in this study is that the more similar the production technology (i.e., stacking techniques and glaze recipes) between kilns, the more likely it that they have frequent interactions.

Preliminary results from stylistic analysis of kiln furniture and compositional analysis (pXRF and LA-ICP-MS) of a large number of ceramic products from the 19 kiln sites suggest that there were two distinct production communities at Dehua and that kilns within the same production community are highly connected in terms of stacking techniques and glaze recipes. Different kilns within the same production community might use raw materials from the same source and employ similar recipes and glaze-making technologies, resulting in significant compositional similarities between kilns.

The project faces several challenges. (1) One of the biggest challenges is how to determine the date of each kiln site accurately. Although archaeological research on Dehua porcelains has a strong emphasis on building chronological frameworks based on the excavations of two kiln sites—Wanpinglun and Qudougong, precise dating of the two kiln sites is still under debate due to the very limited dateable materials available. For other kilns that have not been excavated, it is more difficult to know the precise production date. Archaeological discoveries of Dehua ceramics from several 12th-13th century shipwrecks—such as the Nanhai I shipwreck, the Huaguangjiao I shipwreck, and the Java Sea Shipwreck—provided some insight into the dating of Dehua ceramics of the Song and Yuan dynasties. However, more refined work and more datable materials are still needed to determine the precise production dates of the kiln sites at Dehua. (2) Another challenge is how to sample and quantify ceramic productions from a kiln site. Due to the enormous size of the kiln sites at Dehua, it is challenging to conduct statistical analysis of ceramic products based on archaeological surveys. Moreover, because ceramic artifacts found at the kiln sites are wasters, such as flawed, over-fired, or under-fired sherds, stylistic analysis of sherds collected from the kiln sites may not provide an accurate picture of the production assemblages.