The water-energy nexus of regional outsourcing production in China

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Abstract

Growing water scarcity and energy crisis have been two of the most pressing issues currently facing China, given its rapid urbanization and burgeoning industry. Water and energy are two essential resources intertwining with each other during the whole production process as well as embodied in the economic trading network. Considering the disparity of development condition in various regions of China, the affluent regions prefer to outsource resource-intensive production to backward regions. Therefore, the water-energy nexus in outsourcing production turns out to be crucial for regional balanced development as well as efficient resource management. The linkage analysis, which derived from input-output analysis, could evaluate the backward and forward linkage effect of a certain sector in a trade network, which clearly illustrates the correlation between sector with the whole economic system, and detect the major importer or exporter inner an economic system as well as the nexus effect between water and energy resource embodied in the outsourcing production activity. This research uses linkage analysis approach to evaluate the water-energy nexus in outsourcing production among different regions in China, trying to detect key regions and important production pathways. The results turns out that Hebei and Shandong are essential resource exporter in terms of water-energy nexus, and Guangdong, Jiangsu and Zhejiang turns out to be important resource importer. Considering the outsourcing production, Guangdong, Jiangsu, Zhejiang, Shandong and Shanghai are five typical regions rely on water-energy resource outsourcing to support domestic development. According to our research, the water-energy nexus in multi-regional trade network could be clearly revealed, therefore providing a solid basis for regional development policies and resource protection policies.