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The Quantitative Assessment System for Brine Resource Industry Based on Sustainable Development Theory: a Case Study on Xitai-Jinaier Lake, Qinghai, China

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Salt lake resource is one of preponderant and strategic mineral resources in China. Some important chemical elements contained in brine are highly significant to both agriculture security and national security. Given the research gap of lacking quantitative and comprehensive assessment system of salt lake resource in China, it is critical to set up a scientific as well as practicable assessment system with the purpose of evaluating objectively whether the salt lake resource extraction mode is suitable for the resource carrying capability, and identifying the restrictive factors affecting the sustainability of brine industry. The establishment of such assessment system are of great strategically significance to scientifically determine the development mode and path as well as the scheme of resource allocation in the future.

Based on the sustainable theory and in-depth understanding of the features of salt lake ecosystem, regional background and development status of brine industry in Qinghai province, the study sets up an assessment indicate system contained 1 target layer, 4 criterion layers, 9 sub-criterion layers and 60 indicators from natural, economic and social dimensions. In order to exam the feasibility and operability of this assessment system, 30 selected indicators and a hierarchical entropy multi-objective decision analysis model were applied to evaluate a targeting case: Xitaijinaier lake in Qaidam, Qinghai, China. The evaluation results show that the sustainability and competitiveness of the brine industry in Xitaijinaier salt lake remain low regardless of the good endowment of resources, and the rate of multipurpose utilization should be improved significantly. The paper concludes with a discussion on how to achieve sound and effective brine management in Xitaijinaier Lake as well as

in Qinghai.

Key words: Salt Lake resources, sustainable development, index system, Qarhan Salt Lake

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