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Research on "water-based planting"in Ordos City based on further-up water saving and control of water use

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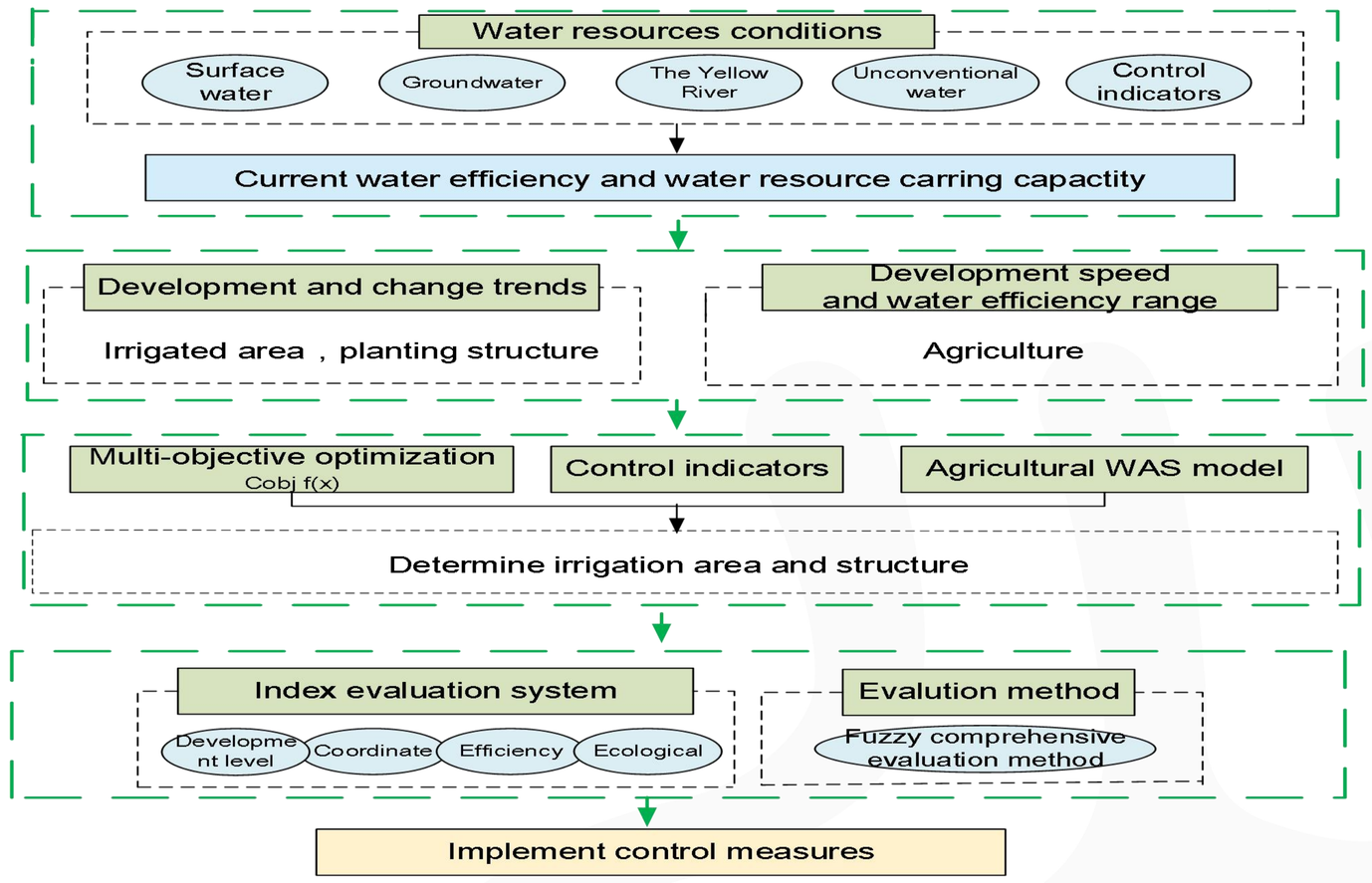
Objectives

Agricultural proportion of Ordos City as high as 70%, large water intake with low economic contribution is the main reason for the low comprehensive water efficiency. Implement the rigid constraint system of water resources and promote the refined management of water resources in Ordos City, the core lies in the agricultural further-up water saving and control of water use. According to the water resources conditions and the current situation of agricultural water use of Ordos City, the coordination relationship and characteristics of water resources and agricultural development was analyzed, and the agricultural water use indexes, efficiency control indexes and development scale in different regions reflecting the high-quality economic and social development and the spatial balance of water resources were proposed. By controlling the scale, structure and water consumption, under the condition of ensuring the key objectives, implement agricultural water saving and efficiency, optimize water allocation and improve water efficiency, so as to ensure the ecological civilization construction and high-quality development of Ordos city.



Technology roadmap

Methods

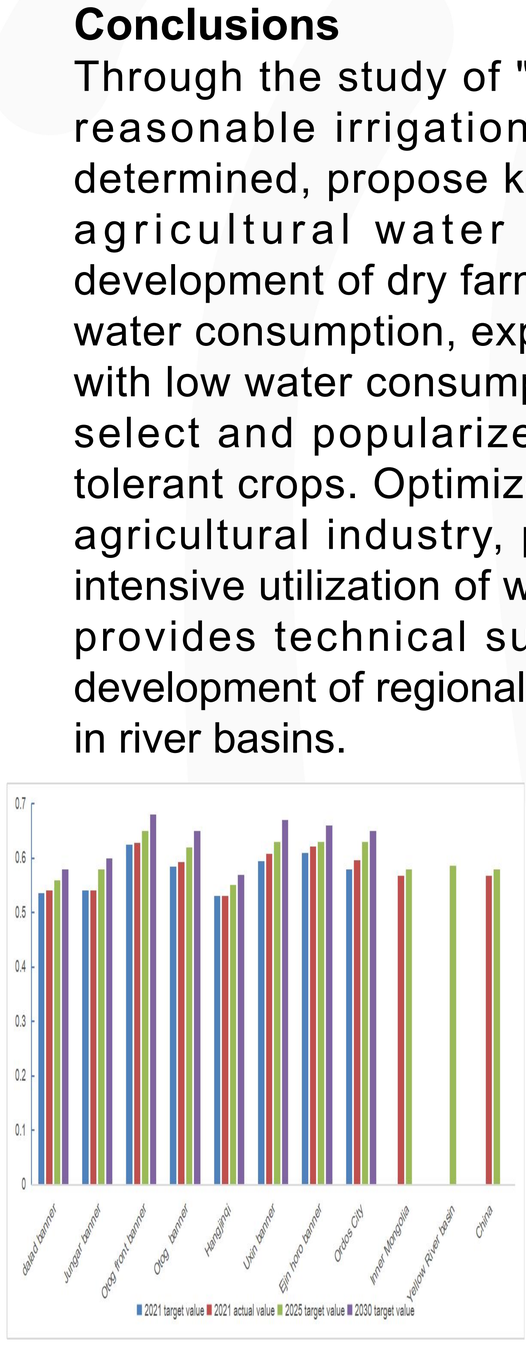
According to the water resources conditions and the current situation of agricultural water use of Ordos City, the coordination relationship and characteristics of water resources and agricultural development was analyzed, and the water demand for agricultural development in the planning year was estimated； under the premise of ensuring the red line of land use, taking the carrying capacity of water resources as the bottom line, build a multi-objective optimization model； based on the characteristics of the water supply project and the agricultural water consumption situation in Ordos City, the agricultural WAS model construction was completed, Agricultural water allocation results in Ordos City in 2025 and 2030 were obtained from water demand prediction and multi-objective optimization control calculation. On the basis of water consumption constraint and coordination analysis, the rational allocation of water consumption in different regions was optimized, and the control results of agricultural water consumption in different regions and the corresponding development scale scheme are put forward.

Results

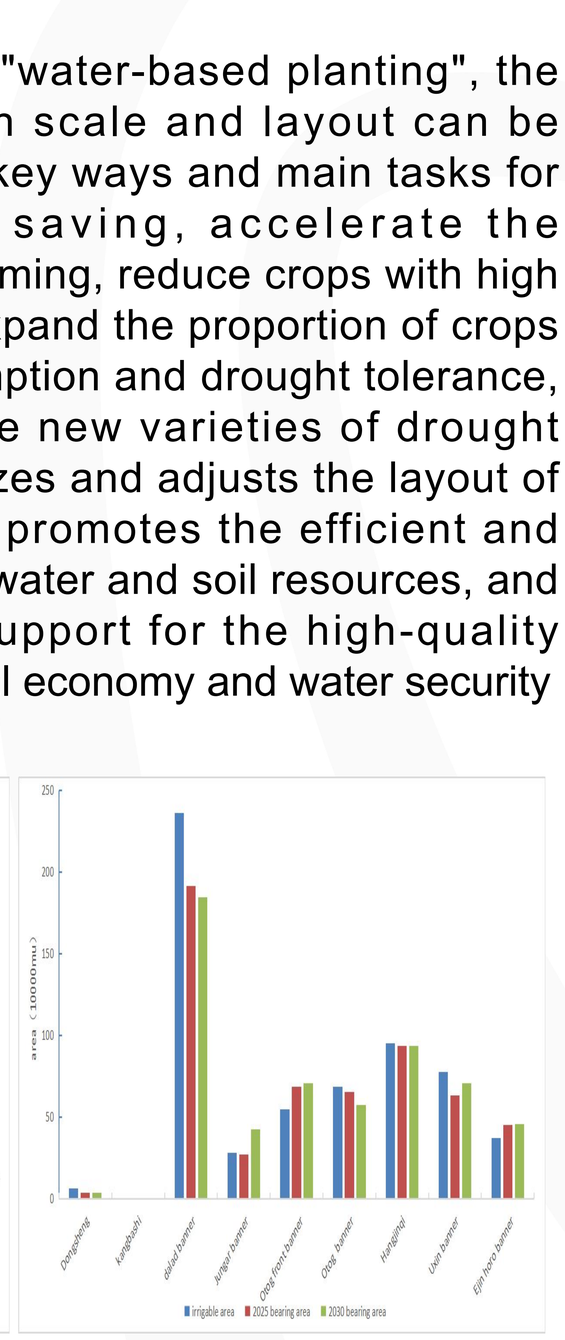
By 2025, the total agricultural water demand will be 1.297 billion m^3 under the planned irrigated area, by 2030, it was 1.277 billion m^3.Combined with the water supply prediction results, calculated the configuration of water through the WAS model construction, on the basis of water constraints and coordination analysis, through the agricultural structure adjustment and water saving, the amount of water allocated in agriculture was decreased, the water resources shift from agriculture to users with better efficiency and higher security requirements such as Industry and life, and the ecological water situation has been improved. By 2025 and 2030, the agricultural scale of Ordos City will be controlled at 5,624,900 mu and 5,740,700 mu respectively, and the water consumption will be controlled at 1,010 billion m3 and 1,014 billion m3 respectively. The expected effect evaluation result is excellent, that means Ordos City has significantly improved the agricultural water structure and the appropriate scale of city and cultivated land.

Conclusions

Through the study of "water-based planting", the reasonable irrigation scale and layout can be determined, propose key ways and main tasks for agricultural water saving, accelerate the development of dry farming, reduce crops with high water consumption, expand the proportion of crops with low water consumption and drought tolerance, select and popularize new varieties of drought tolerant crops. Optimizes and adjusts the layout of agricultural industry, promotes the efficient and intensive utilization of water and soil resources, and provides technical support for the high-quality development of regional economy and water security in river basins.



Compliance of irrigation water utilization coefficient indicators



Compliance with bearing area