

## WATER RESOURCES CARRYING CAPACITY AND ITS ASSESSMENT

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Recent years, water resources planning, development and management have been basically driven by supply oriented approaches. Due to overuse, water issues have become rigid constraint on the sustainable socio-economic development in many areas.

Water carrying capacity is a valid index to identify supportable human activities by water resources under certain living standard in specific region. The concept of water resources carrying capacity (WRCC) was put forward when dealing with water resources planning, development and management. The purpose of study on WRCC is to provide analytical tools to seek the trade-off between water resources development, social-economic sustainable development and environmental and ecological protection, thus present suggestions about future regional planning. Basically, it is expressed by the bearable economic scale and population under specific level called carrying level.

In this paper, the definition of WRCC is stated through analysis of the basic meaning of carrying capacity and current study productions in this field. Available natural water resources and production efficiency of water use are two decisive factors of water carrying capacity. WRCC always depends on the level of comprehensive efficiency of water utilization. Given the total water resources is reliable, the technical level and average production value per person determine the value of WRCC.

Therefore, a method is presented which can quantitatively calculate the critical threshold value under different living standard. Figure 1 shows the major process of this method. It estimates the available water resources for the production enterprise with the subtraction of uncontrollable floods and necessary ecological water demands from the total water resources. Then through the analysis of industrial structure in specific carrying level, the comprehensive water consumption of all major production sectors under specific carrying level. By comparison of available water resources to production enterprise and the water consumption per unit GDP, the total bearable economic scale is figured out. In term of the average GDP per capita under such carrying level, it is easy to calculate the bearable population. After necessary calibration and iterative checking the preallocation to domestic water demands, the rational WRCC represented by total economic scale and population can be provided.

According to the method, a case study for an island demonstrates the concrete approaches in this methodology.

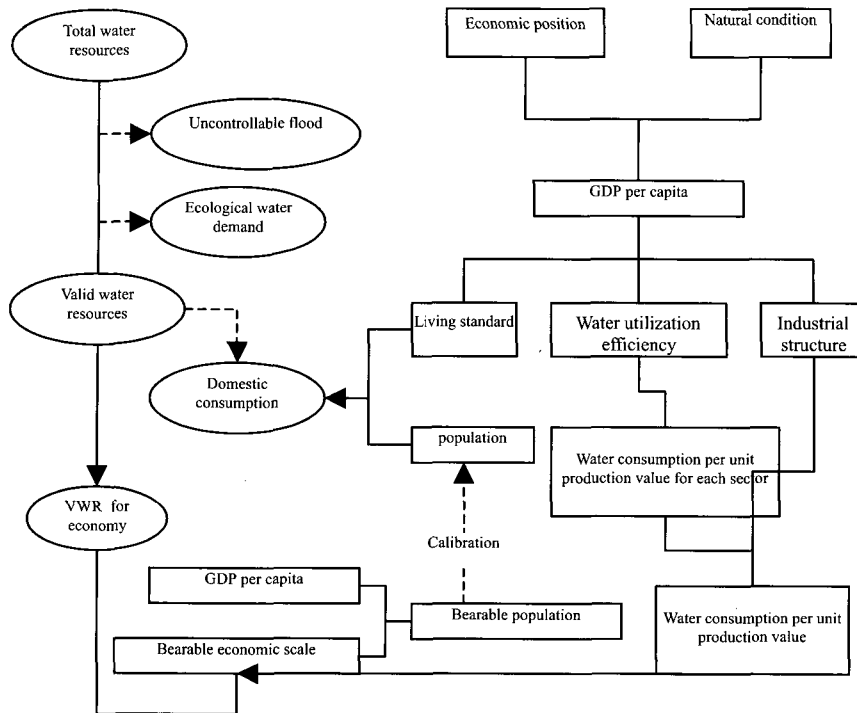


Fig. 1 computational framework of calculation for WRCC

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