Integrated water resources management needs to balance all the aspects of economy, society, resources, environment and ecology, and an integrated model is desired for the purpose which should include the functions of hydrology, environment and ecosystem simulations, water resources allocation, and macro-economy analysis etc. By coupling a distributed hydrological and water quality model (WEP-L), a water resources allocation model (ROWAS) and a multi-objective decision-making model (DAMOS), we established an integrated model of hydro-environment and socio-economy for water resources management in the water-stressed Haihe River Basin in the Northern China. The model was validated by comparing the simulated results and the observation data of river flow, reservoir water level and groundwater level. After establishing future scenarios considering socio-economic development, hydro-meteorological condition, land use change and water diversions from the Yellow River and Yangtze River, we applied the model to study water resources management issues in the basin like water consumption control target, restoration strategy of the overexploited groundwater aquifers, increase of river critical flow and flow into the Bohai sea etc. We concluded that the water cycle under impact of human activities can be simulated by the integrated model, the combination of water allocation and hydro-environment simulation makes the simulation more useful than before and provides a support tool to decision-making, though the scaling-matching work among the modules with different scales needs a further study.