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Integrated water resources management using the DPSIR approach, (Case study: Najaf Abad basin, Iran)

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With increasing population and limited water resources in arid and semi-arid countries such as Iran, there is an increasing need for better management of water resources and not looking at the balance of resources and water consumption alone. Based on the current needs, water resources management has been shaped by pattern shift and Integrated Water Resources Management (IWRM) has been introduced as a dominant paradigm. IWRM is a comprehensive approach, Moreover considering water resources and consumption, the other variables like economic, environment and social status is discussed. In this regard, in order to evaluate the water resources systems, a set of markers is required in order to provide such a group of markers using the DPSIR framework. The DPSIR process is an analysis based on the causal-causal relationship of factors for policy-making and management planning. The DPSIR framework or the Driving forces Pressure State Impact Response is presented to a better understanding of complex systems, including the studied system. In other words, the integrated look upon this method helped us to accurate identify the system in all of aspects. Hence, in this study, the DPSIR assessment and management framework was implemented in one of the tense areas of Iran, socially named Najaf Abad. The results of research on the status of water resources in the Najaf Abad aquifer showed that the stimuli have been identified, and the pressures in the studied area have led to a decrease in groundwater level and water quality decline. After determining the state of the system, the pattern of consumption of industry, cultivation and domestic use was introduced as a driving force of the system and by analyzing the hydrological parameters of the system pressure indicators. Furthermore, in this study the effects of the system were analyzed in the environmental, economic and social sectors.

The main purpose of this study was to investigate the system's capabilities, identify the driving forces and drivers and the roots of pressure in order to evaluate the Najaf Abad aquifer system to introduce a suitable framework for adopting management policies to reduce system pressures. Finally, the results indicate improvement of system conditions by applying non-structural and managerial solutions and scenarios, such as modifying the cultivation pattern, increasing the level of farmer's education, increasing efficiency and reducing groundwater exploitation. The use of the DPSIR analysis in this paper links the driving forces to environmental pressures-water resources and economic and social issues, system responses, and national laws-as a useful tool for planning and deciding upon the use of water resources within the basin.