

# Groundwater Resources of Iceland - Availability and Demand -

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## ABSTRACT

*The availability and hydrogeological nature of groundwater in Iceland is very different in the geologically younger formations - Late Quaternary and Recent, as compared to the geologically older formations - Tertiary and Early Quaternary. In the former ones the bedrock is highly permeable, while active and open fissure swarms enhance the permeability as well as creating a strong anisotropy. This results in a concentration of the groundwater flow appearing in springs or groups of springs with an unusually high discharge. In the latter formations the exploitable groundwater is mostly restricted to sedimentary aquifers with a limited yield, which is also subject to seasonal fluctuations. The groundwater in Iceland is generally low in chemical contents and free from pollution.*

*Extraction of freshwater for public and private uses has been steadily increasing during the last decades, and in the last years in an almost explosive way, due to the rapid development of large-scale fish farming in the country. This has intensified the difficulties in freshwater supply and may in due course lead to conflicts in the exploitation of freshwater, which sooner or later will call for some centralized administration of this important national resource.*

## INTRODUCTION

In Iceland freshwater has been considered an easily available and inexpensive commodity. This is understandable in view of the low population density - 2.5 inhabitants/km<sup>2</sup>, and high precipitation - about 2000 mm/year. But in recent years the demand for a reliable supply of clean freshwater has been rapidly increasing. Some prime factors that influence this development are:

- Population growth is rather high, with an annual average of more than 10 per mil in the last decade (*Hagstofa Íslands, 1984; Baldursson, 1987*).
- Standard of living is getting higher. In recent years the private consumption has been higher than in the other Nordic countries (*Hall and Pétursson, 1987*).
- New and more strict quality demands are being made in the fish processing industry.
- An exceedingly fast growing and both qualitatively and quantitatively water-demanding fish farming industry (*Sigurðsson and Einarsson, 1986; Rannsóknaráð ríkisins, 1986*).

In the meantime the consumption of freshwater per capita has been amongst the highest in the world. As it gets still higher, the imbalance between the rate of exploitation and that of hydrological investigations is made still more difficult to resolve.

The freshwater resources in Iceland are mostly restricted to groundwater, as surface water is frequently polluted by dirt and mud. The source of dirt