



Tropentag, October 6-8, 2009, Hamburg

“Biophysical and Socio-economic Frame Conditions
for the Sustainable Management
of Natural Resources”

The Effects of the Current Cropping Pattern on the Sustainability of Ground-water Resources in the Darab Central Plain

SUDEH DEHNAVI, BEATRICE KNERR

University of Kassel, Department of Development Economics, Migration and Agricultural Policy, Germany

Abstract

The cropping pattern implemented in many regions of the world is not adapted to the ground-water resource restrictions in term of sustainable use. Ground-water resources are sensible to cultivation patterns, especially in arid and semi-arid regions. Darab central plain is a region confronted with ground-water level lowering. The research hypothesises that the cropping pattern is significantly enhancing ground-water depletion in this plain.

Due to ground-water level lowering, water availability in the Darab central plain (684.4 km²), in Iran's arid and semi-arid climate zone, is increasingly restricted. The ground-water level has dropped on average, by 1.36 metre per year. With an annual average precipitation of about 248 mm (during 1996–2006), farming in this area strongly draws on ground-water resources for irrigation, resulting in annual negative water budget of 41.47 million m³. Currently, some villages are starting to face drinking water shortage. As in some areas, there is not sufficient water for agricultural purposes, some farmers have lost their employment and live on governmental support or have to commute for work in the other areas or migrate to the cities where they often join the mass of underemployed.

The paper will present the effects of the current cropping pattern on the sustainability of ground-water resources in the Darab central plain. The cultivation area of different agricultural products and their water needs are compared with the amount of ground-water decrease in different areas. The amount of ground-water used for different agriculture purposes in proportion of the ground-water used for agricultural purposes in relation to the total available ground-water in the Darab watershed is calculated. For the analysis, secondary data, collected from governmental organisations of Iran, Fars province and Darab sub-province, are used. The results indicate that the current cultivation pattern of the Darab central plain has led to ground water depletion in this region. In particular wheat and maize production significantly affect the ground water level in Darab central Plain.

Keywords: Arid and semi-arid regions, cropping pattern, Iran, water shortage