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Benefits and impacts of re-use of agricultural drainage water in Egypt to land degradation and food security

Egypt is not plentiful in agriculture resources, whereby the total cultivated land is only 3.6 million ha, and total renewable freshwater is only 62 Billion Cubic Meter (BCM) for 104 million people (the annual water resources in Egypt depend mainly on the Nile water (55.5 BCM), 5.5 BCM groundwater, and 1.3 BCM of rain water that falls on the agricultural land in the Delta, in addition to reuses of wastewater about 20 bcm) . Agricultural drainage water contains appreciable amounts of salts, residual fertilizers and pesticides which have negative impacts on soil properties and food productions. Most of the groundwater in Egypt is non-renewable except for the shallow groundwater in the Nile valley and Delta lands and its fringes in addition to some depression sources and oasis like Wadi El-Natron in the west Delta (the Valley of Sodium salts) and Siwa oasis south of the northwest coast of Mediterranean.. The water shortage in Egypt exceeds 42 BCM/year with Egypt's water share per capita being 600 m/year. This severe shortage of water resources and arable lands in addition to growing population are one of the reasons why Egypt is one of the largest food importers in the world. Egypt is the biggest importer of wheat (12 million tons/year), and fourth importer of maize at 8.5 million tons/year and the seventh biggest importer of edible oils in the world, with a

gap, reached 100% of lentil, 70% of broad bean, and 32% of sugar and 60% of red meat, butter, and milk powder. There are several impacts of food and water insecurity and socioeconomic impacts such as the soaring price of food, and small and tiny farm. More than 80% of land tenure and ownership is less than 0.8 ha in addition to very low share land per capita not exceeding 0.14 acres and continuous increase in poverty rate, which reached 27.8% at the end of the year 2016. To deal with this food insecurity, Egypt counts on major reclamation projects for an addition of more than 1 million acres as an extension to the present agricultural land located in North Sinai, at Toshka in the southwest valley and the Oweinat project in the far south of the western desert near the border with Libya. Agriculture related policies in Egypt should be reformed to plan and advance increased food production especially the essential crops such as wheat, maize, sugar, lentils and broad bean, oilseed, and meat and dairy products. Moreover, Egypt should make serious efforts to find new sources of water to combat water shortage, which may include untraditional sources such as desalination of seawater, treated sewage and treated industry water, and reclaimed agricultural drainage water, and also develop and renovate the whole agricultural system.

Biography

Nader Noureldeen Mohamed is a professor at Cairo University in the field of Natural Resources, Food security expert, Desertification and Reclamation. Throughout his short career thus far he has participated in several projects, either academic, career oriented or private. For each project he has completed and gained a new experience and vast knowledge, the purpose of this document is to highlight the various types of work he has done, exposure, knowledge and experience gained. All work represented here is work conducted entirely by myself or work he was in a position to supervise, influence and present as a team effort.

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