

Saudi Arabia News (3)

Part 3: The Demonstration Project of Large-Scale Desert Greening by the Japan Petroleum Energy Sector (PEC)

Development of water treatment technology - water circulation system for decomposition and removal of concentrated NH₄-N(Riyadh)

The demand for this technology has derived from the recent trend of fisheries promotion in Saudi Arabia. With this technology, NH₄-N can be decomposed and removed from the water once used for inland tank farming of tilapia 'Oreochromis Niloticus' which can survive both in freshwater and brackish water (up to 10,000 ppm). Thus the purpose of this project is to develop and demonstrate water-saving freshwater fish farming technology with the water recycling system. Moreover this project aims eventually to establish a water-saving agro-fisheries system by incorporating the techniques of intensive fish farming as well as hydroponics.



Development of water-saving irrigation technology

1) Water-saving irrigation technology using perforated tubes (Riyadh)

This project aims to demonstrate the underground irrigation technology by using perforated tubes (brand name: Leaky Pipe, see figure below) buried underground. In this way, there would be very little water evaporation and salt accumulation on the ground surface, which normally cannot be avoided in the conventional irrigation methods (e.g. with sprinkler or drip irrigation). This underground irrigation system can be used for growing lawns for sports grounds etc.



2) Technology to form impermeable layer with polymer solution (Riyadh)

This is to develop a technology to form underground impermeable layers by infiltrating polymer solution into the soil. The solution will react with the polyvalent cation in the soil and form a hemispheric impermeable layer, through which water will not seep down easily. This layer can be formed at any depth, and with this method it is expected that irrigation water can be retained longer in the root zone of crops without draining fast, and also accumulation of salt on the ground can be prevented.

3) Water-saving irrigation with water-holding materials (Riyadh)

The sandy soil of arid land has a very poor water holding capacity, and the climatic conditions are such that it lacks enough microbes and organic substances for vegetation to flourish in the soil. In attempting greening in such environment, the only water available for plants is that provided artificially by irrigation. This project aims at increasing the water-holding capacity of the soil by using artificial water-holding materials, industrial materials such as water polymer as well as natural water-holding materials made of organic substances such as peat moss. The appropriate conditions are being studied for mixing these materials with the soil according to target plants.

4) Research and development of water-saving irrigation systems and selection criteria of water supply and sewage appliances (KACST HQ)

Water resource utilization and management in arid lands is not possible without water-saving technologies. Here criteria for assessing water-saving appliances are being developed as part of such technologies. By developing a database on various appliances, the project aims at easing the process of selecting appropriate water supply and sewage appliances for efficient water resource management in Saudi Arabia.

5) Development of irrigation planning and rehabilitation methods for the purpose of water resources conservation in Saudi Arabia (KACST HQ)

80-90% of the groundwater use in Saudi Arabia is for agriculture, and a great deal of such water is not being used efficiently but wasted. Under these circumstances, this project consists of four main activities: (a) development of management and assessment systems in irrigation planning; (b) development of an overall analysis model in the field of irrigation water use system, groundwater resources and planning; (c) field visits and inspection; and (d) proposal for the rehabilitation of existing irrigation plans. It aims at promoting more efficient water use and thus improving the country's water resource management. At present necessary facilities are being set up and these research projects are just starting to take off seriously. Incidentally, at the time of writing (December 1999) when the issue of Arabian Oil Company's oil drilling concession in Khafji oil field, which was to expire in February 2000, was a major news item in newspapers, the government of Saudi Arabia requested an extension of the large-scale greening project.

(Please note that we failed to mention the above project numbered (5) earlier in AAINews Vol.25 and introduced it here for the first time.