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The most perfect ecosystem: The QANAT KAREZ salt leaching oasis of the ancient silk road, as the model of aquaculture and chemical engineering to transform our present-day food agriculture

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M R Bloch salt archive, Israel

More than 150,000 thousand, QANAT, KAREZ sweet water distribution systems including more than 200,000 kilometers of tunnels still exist in the Middle East, Central Asia and Mediterranean basins. Since the Islamic agricultural revolution which took control of these mountain watershed sources, they are operated incorrectly losing uncontrolled quantities of spate irrigation water. The original ancient design was to direct water to arid zone SABKHA endorheic basins in order to leach salt deposits by dissolving, recrystallizing and precipitating the salts as pure thick strata of salt crust. The tunnels are used today only for domestic and local agricultural water supply. The engineering

and construction of these systems involved an extremely heavy investment, in extreme desert conditions. The human cost of building the tunnels and boreholes could only have been justified by the value of the salt products resulting from the irrigation and surge flooding mechanisms. This forgotten technology which included a fish and fish waste recycling process for ancient "hanging garden" hydroponics, is no longer in use. The misunderstanding has caused the misuse and inefficiency of the water supplies of many communities which still rely on the ancient Qanat.

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