

## Entrepreneurial options for capacitive electro dialysis in the West Bank, Palestine

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### ABSTRACT

The research conducted within the Palestinian Dutch Academic Cooperation on Water (PADUCO) program confirms that capacitive electro dialysis (CED) has the potential of becoming the next innovation in water purification. It uses less energy (<0.5 kWh/m<sup>3</sup>) than reverse osmosis (3–10 kWh/m<sup>3</sup>) and is, in particular, promising for local small-scale use, since it produces clean irrigation or drinking water not continuously, but in batches. The current prototype produces 2 m<sup>3</sup>/d for irrigation and 1.6 m<sup>3</sup> for drinking water. Additionally, research has been conducted on options for entrepreneurship, taking into account a conducive context of required policies and institutions. These to an extent appear to be a condition for a successful introduction. The present publication aimed to research the feasibility of using this CED device for four types of use: irrigation for small farmers and large-scale farmers and small-scale and large-scale drinking water companies that presently use reverse osmosis. Preliminary results showed that medium-sized water companies may most easily introduce the technology and that in the long-term small-scale water companies and small-scale farmers may benefit most from the new technology. A scenario for an improved entrepreneurial approach for drinking water companies and farmers is also developed considering their level of sophistication and the further development of the CED system towards large-scale production (of the CED system itself) and user-friendliness. At present, medium drinking water companies and medium farmers appear to be better positioned for the adoption of the new CED technology, as they produce and operate on a higher level of sophistication. Especially for the small farmers but also for small drinking water companies, more training and support, also with capital investment, is required. This can succeed if government agencies, Non-Governmental Organizations, investors, and other stakeholders align their efforts to that purpose, in this way creating a conducive policy and institutional environment. For the initial introduction of the CED system and in order to make it affordable, introduction for humanitarian purposes, refugees, Bedouins could be the first step.

**Keywords:** Capacitive electro dialysis; Drinking water; Irrigation water; Entrepreneurship; Farmers; Governance

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