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Mainstreaming climate change for sustainable mega water projects in Egypt

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Egypt and other participating countries in United Nations Framework Convention on Climate Change (COP 21) have reached agreement for the first time ever, to limit global temperature increases below 2°C. Egypt has an ambitious 1.5-million-feddan project to set up new communities. The project should improve irrigation at new and will depend on solar energy for water pumping. Conventional energy resources establish a significant commitment on the environment and economy. Providing energy demand should be without adding to climate change. Significant reductions in greenhouse gas (GHG) emissions are necessary to limit the magnitude and extent of climate change. This paper aims to reach sustainable climate targets. Environmental performance of solar photovoltaic for water pumping in 1.5-million-feddan project is examined. The study identifies the effectiveness of Clean Development Mechanism as a tool for assessing environmental impacts of this mega project. Relative to baseline, project scenarios of the utilization of the fossil fuels and the solar photovoltaic technology have been assessed. The net difference in GHG emissions between scenarios due to existence of the project has been estimated. The greenhouse gas (GHG) emissions throughout all stages of the life of PV technologies have been determined. Results compared with GHG estimates by fossil fuel heat indicated that life cycle GHG emissions are higher in conventional sources as compared to Solar photovoltaic (PV). The results indicated that the examined solar photovoltaic technology offer substantial contribution to climate change by effectively producing limited amounts of GHG emissions, which are close to zero. Significant reductions in life cycle GHG emissions are achieved in the operation of the 1.5-million-feddan project. PV technologies are considered “Clean Development Mechanism” because their operation does not generate any carbon dioxide. The paper concludes that the solar photovoltaic technology is a sustainable renewable energy option to mitigate climate change. PV combats greenhouse gas emissions and contributes to mitigating climate change and to promote sustainable development (SD) in Egypt. In this regard, solar photovoltaic (PV) appear to be the most efficient and effective solutions for clean and sustainable energy development for 1.5-million-feddan project in Egypt.

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