*J. Int. Environmental Application & Science,* Vol. 5 (1): 99-112 (2010)

# Performance of a Pumping System Handling Nile Water Hyacinth under Variable Operating Conditions

Mohamed F. Khalil[1], Sadek Z. Kassab[1,3], Ahmed A. Abdel Naby[1], Ali Azouz[2,*]

[1]*Mechanical Engineering Department Faculty of Engineering, Alexandria University Alexandria, 21544, Egypt;* [2]*The Petroleum Projects and Technical Consultation Co (PETROJET), Egypt;* [3]*Present Adress: Mech. Eng. Dept., Collage of Engineering and Technology, Arab Academy for Science and Technology and Maritime Transport, Alexandria, Egypt*

*Received January 18, 2010; Accepted March 10, 2010*

**Abstract:** The present experimental study deals with the effect of varying the operating parameters on the performance of a recovery pumping system handling Nile water hyacinth. Pump suction inclination angle, water height above pump inlet, inlet suction cone diameter, and pump flow rate are the operating parameters considered in the present study. Experimental results are presented for Nile water hyacinth recovery rate, NRR. In Addition, NRR is predicted by a general empirical correlation, using the obtained experimental data, as function of the operating parameters used in the present study. Within the operating range of the considered parameters, the obtained results show that the Nile water hyacinth recovery rate increases with the increase of pump suction cone inlet diameter ratio and water-Nile water hyacinth mixture flow rate ratio. It decreases with the increases of the inclination angle of the centerline of the pump suction cone with respect to the vertical plane. The effect of varying water-Nile water hyacinth mixture height ratio above the pump suction cone inlet (submergence height ratio) on the Nile water hyacinth recovery rate depends on the range of this height ratio.

***Key Words:*** *Water hyacinth, Nile River, Centrifugal pump.*

[*]*Corresponding: E-Mail: azouz19680409@yahoo.com ; Tel: +20125156513; Fax: +2035921853*