

**Establishment of a district cooling system using deep sea water potential at
Mtwara/Mikindani municipal council
Goodluck Rulagora
Master of Science (Energy Engineering)
University of Dar es Salaam, College of Engineering and Technology, 2016**

Refrigeration systems are used for providing cooling and dehumidification in summer for personal comfort. District Cooling System is the production and distribution of cooling from a central facility to multiple buildings. Cooling and refrigeration account for about 15% of total electricity consumption worldwide and as much as 30% in highly developed countries with a warm climate. Sea water is a renewable energy source that could be used for District Cooling. The recent study of trends in mean Sea levels indicates falling Sea level in Tanga, Dar es Salaam and Zanzibar. However, sea level is rising in Mtwara. At a depth of 1000 m, 10 nmi or average of 19 km from the sea shore of Mtwara/Mikindani Municipal Council, Sea Water of temperature 6 °C will be obtained which is suitable for Air Conditioning application. Seawater Air Conditioning is certainly regarded as one of the best emerging technologies to cover up conventional Air Conditioning systems. By using economic equation, Sea Water Air Conditioning investment is viable as it recoups the capital invested approximately in 20% of its life span, hence ensures capital investment security and profit through approximately 80% of its life span. Another area which must be included in future work is hybrid systems involving the use of conventional system (Chillers) and sea water especially along the coast of Dar es salaam, Tanga and Zanzibar where required depth is not available for Sea water Air conditioning. Compared to conventional system of the same cooling capacity, Sea Water Air Conditioning system cuts about 81% of the total power consumption and reduced carbon emission to the great amount.