**Submission: Qatar University**

**Multi-Scale Spatio-Temporal Analysis of Fish Mobility using Hyper-Spectral Imaging and Management of Coral Reef fishers for Arabian Gulf**

**Awase Khirni Syed**

Spatio-temporal scale is an effective method for studying trends in various surface processes. A new methodological paradigm for integrating hyperspectral remote sensing data on different spatial and temporal scales to study the temporal variability/stability of key fish species in Arabian Gulf. This study would help us in rehabilitation projects and understanding the factors involved in degrading ecosystems at large Spatio-temporal scales. We investigate the current and historical states of the fish in Arabian gulf regions and the factors affecting their growth or decline in numbers. We intend to use electrofishing and habitat mapping techniques clubbed with hyperspectral imaging data to understand fish mobility in Arabian gulf region. We intend to replicate these studies across various geographies to understand fish behaviour in the Red Sea, Gulf of Aden, Arabian Sea and other large ocean bodies. The study also aims to provide a means to explore various techniques using hyper-spectral imaging to identify/survey different species on a spatio-temporal scale and provide predictions of their population growth and decline because of various factors being human, rising climatic conditions, etc. The study will also help present simulation of fish behaviours based on their current ecosystem and large marine ecosystems. This would help in predicting aquaculture harvesting for commercial fishing industries in real-time.