

## GENERATING THE HIGH-RESOLUTION ORTHOPHOTOS AND DIGITAL ELEVATION MODEL(DTM) FOR CONSTRUCTION OF SALINITY BARRIER ACROSS NILWALA RIVER

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### ABSTRACT

Due to the freshwater scarcity resulting from the increment of the sea level and followed exacerbated along with the deepening of the river beds through unregulated sand mining activities, it has been necessitated to have a salinity barrier across rivers in Sri Lanka. Having salinity barriers enable the upstream water drinkable and can use for agricultural purposes mainly while automatically sensing the salinity levels. Nowadays, with the convenience of modern technology, with high-resolution imagery different kinds of digital models can be prepared. The main purpose of this study is to provide the basis for identifying +1.0m contour and to demarcate the +0.6m contour (with respect to the MSL) and quantity of the exact inundation area during the gate close period of the Matara Stage IV water Supply Project. The resulting approach allows the acquisition of a rapid, standardized, and low-cost Digital Elevation Model (DEM) and high-resolution orthophotos. The selected research location was the Salinity Barrier (1) of the Nilwala River and the adjacent areas. After a thorough field inspection to identify information about obstacles, heights of man-made features, tree clusters, and terrain variations, with a questionnaire survey, an Unmanned Aerial Vehicle(UAV) Survey and a GNSS RTK receiver all the relevant data were acquired. Modern general digital photogrammetric technique and Pix4D Mapper software is used for data processing. The expected accuracy level of ground sampling distance was 1.98cm since the expected value was 2cm. And we received a vertical accuracy of 5cm as we expected. Ground truth information and transferred MSL value to the study area were used as the main quality control methods. This study showed that the exact inundation area was more enormous than the expected level from the previous preliminary studies and a vast area will be affected negatively if the salinity barrier is implemented rather than beneficial.

**Keywords:** *Unmanned Aerial Vehicle, Digital Elevation Model, Salinity Barrier, Nilwala River*