IMPACTS OF FOREST COVER AND CLIMATIC FACTOR TO WATER QUALITY OF RIVER ECOSYSTEM IN INANAM LIKAS RIVER BASIN (ILRB), KOTA KINABALU, SABAH.

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ABSTRACT

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Forest cover and climate change may impact river water quality by affects the amount of sediment concentration, soil texture, precipitation and fluctuating water temperatures of rivers. The aim of this study is to determine the river water quality status in Inanam Likas River Basin (ILRB) and the future of river water quality which can be correlated to the effects of forest cover and climatic factor. This study focuses on the analyses of river water quality by determining the Water Quality Index Sub-Indices (WQI_{sub}) on the basis of the physical and chemical parameters. Sampling was carried out three times which involving four stations along the ILRB. The sampling stations were labelled as Station 1, Station 2, Station 3, and Station 4. The parameters water temperature (°C), pH, salinity (ppt), depth (m) were measure *in-situ* using an multiparameter YSI Model, Depth sounder, pH probe and Refractometer accordingly. Determination of the concentration levels of total nitrate were measured *ex-situ* in laboratory using UV-Vis Spectrophotometer with wavelength 220nm. Therefore, sediment and soil texture also conducted in ex-situ while result for climate was from the secondary data. Overall, river water quality of ILRB was in class III, which has the value of WQI_{sub} 70.21 and corresponded to classification of slightly polluted and average water quality. The value of air temperature and precipitation showed a change in the period of 2007 to 2016, while the sediment also show that station 1 has the highest sediment. From statistic test using SPSS IBM 21 shows that there is correlation between water quality level, forest cover and climate change variables, which sediment ($r = 0.144$, $p < 0.05$) and precipitation ($r = 0.096$, $p < 0.05$). Therefore, the fluctuation of forest cover and climate change variables of sediment and precipitation will affect water quality level.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Water is a vital element of all natural resources and is vitally important for life, where most of the territory is covered with water. But the availability and quality of freshwater in many parts of the world is increasingly threatened by excessive use, abuse and pollution. The river is important not only for humans but also for the surrounding ecosystem, including fish, plants and animals. While, the surrounding ecosystem determines the water quality level is damaging to the upper and lower surface of the river ecosystem if the water rate is poor.

The effect of forest cover variations in the average current flow is well known and global data have shown that the increase in forest cover decreases the volume of the total flow absorption scale. Forests are the basis of livelihood and the development of humans and other organisms and play an important role in maintaining the overall carbon balance in combating climate factor and the protection of biodiversity (Feng *et al.*, 2016).