CHAPTER 1

INTRODUCTION

1.1 Background of Study

In this study, water consumption of WSTP needs to be determined. WSTP is a process of water treatment through several steps which begins with the water intake, aeration, mixing, flocculation, sedimentation, filtration and backwash. WF approach was used in this study as a tool to assess the amount of overall water consumption for the WTP.

For years, Life Cycle Assessment (LCA) has been used to evaluate a wastewater treatment plant and all the impacts are evaluated from the construction process to operation and until the dismantling process (Corominas et al., 2013). There are four phases in LCA, firstly is setting goal and scope definition phase, secondly the inventory analysis phase, thirdly the impact assessment phase and lastly is the interpretation phase (The International Standards Organisation, 2006). In this assessment, the most importance phase that also an adapted method from LCA is the impact assessment phase. However, LCA is a broad impact assessment tool and in LCA, all environmental impacts those are connected with a product or service have to be assessed (Klöpffer, 1997). As for example, LCA of building sector must be assessed from the early stage which is before the construction begins until the demolishing and transportation of waste materials stage (Cabeza, Rincon, Vilarino, Perez, & Castell, 2014). Basically, LCA is used to estimate the broad environmental impact such as global warming, eutrophication, acidification, human toxicity, pollution and many more impacts based on standard methodology named ISO 14040 (The International Standards Organisation, 2006). As seen, LCA is not focusing on specific impact like the impact on water resources of particular development or service. However, the importance of water uses and impacts are being assessed in LCA but LCA does not quantify and map indirect

water use that involved along the supply chain in water resources management (Boulay, Hoekstra, & Vionnet, 2013). In term of sustainability of water resources, it is not fare if not assessing on overall water resources.

Hence, the aim of this study is to introduce a WF approach in order to determine the sustainability of the services category through the WF accounting for WSTP. Therefore, the sustainability of WSTP will be able to be assessed.

1.2 Problem Statement

The environmental industry deals with a tremendous amount of problems, of which determine its productivity and being eco-friendly. This study can offer many advantages in saving the usage of water in future. The reason to create water footprint is when there is not enough water in the world. And the reason of not enough water is when there is increase in population. When the population increase, the usage of water also increases, so thus the degradation of water quality of the similar water sources. When there's too many factory that dispose of waste into the river or sea, the water that can we use will be lesser than before. It is believed that the climate changing occurrences like La Nina and El Nino are also the reason that might contribute to the water shortages and eventually the water stress.

1.3 Objective

The objectives of this research are as the followings;

1. To determine the water footprint of Water Supply Treatment Process (WSTP) at Semambu Water Treatment Plant (WTP).
2. To determine the water availability of the involved river for water intake (Sungai Kuantan)
3. To determine the effect of land use development to the water supply sustainability.

1.4 Scope of Work

This study focuses on sustainable of water supply due to the land use development at Kuantan, Pahang. One of the Water Supply Treatment Plant (WSTP) in Kuantan basin that has been selected is Semambu WSTP. The source for water intake involved for the Semambu WSTP is Sungai Kuantan. All the data used in this study was secondary data obtained from several local authorities such as Pengurusan Air Pahang Berhad (PAIP), Department of Irrigation and Drainage (DID) and others. All the calculations in this study were in accordance to Water Footprint Manual.