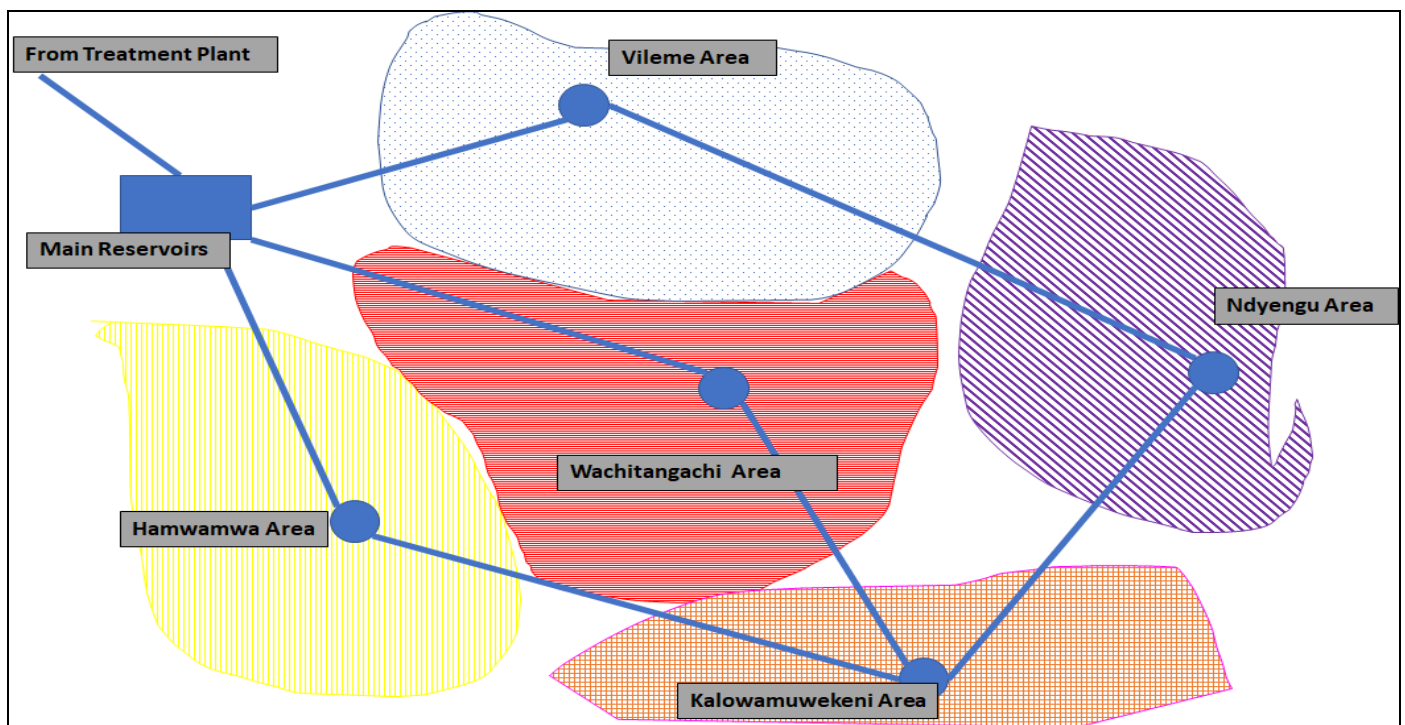


**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF ENGINEERING**  
**DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING**  
**CEE 4412: ENVIRONMENTAL ENGINEERING I**

**ASSIGNMENT NO. 02.**

**DUE DATE: 27/08/2021 17:00HRS**

A water supply system is being designed for Chaona District which is a new district in Luopili Province. The layout of the district is presented in Figure 1. The demographic data for the various areas within the district is presented in Table 1. It is anticipated that the design and construction works will take a period of five years. The life span of the project is anticipated to be 20 years. Design the required diameter of the Trunk Main to adequately convey the water from the treatment plant to the main reservoir. Where information is not given, make and clearly state your assumptions.



**Figure 1: Layout of Chaona District**

**Table 1: Demographical data for the various areas in Chaona District**

Area	Type of Area	Size of Area (Ha)	Population Density (No./Ha)	Coverage (%)	Population (No.)
Vileme	Medium Cost	100	-	-	70,000
Wachitangachi	High Cost	120	-	-	80,000
Ndyengu	Low cost	52			120,000
Kalowamuwekeni	Peri-Urban	30	250	70	-
Hamwamwa	Low Cost	35	120	70	-