Can We Improve Flood Protection?

Background:

Annual flooding in Indonesia especially in the capital city Jakarta is not inevitable anymore. Ciliwung river, the most famous Indonesian river that flows along 3 big cities such as Jakarta, Depok and Bogor has played big role in the city flooding since 20th century [1]. It has been concerned as it appears to be occurring more and more frequently for these past 5 years. In this report, I am going to investigate the flood that occur in Depok floodgate on early January 2020. Using the height, river-flows and time parameter obtained from the Jakarta-flood statistic website [2]. These data are needed to find the Flood Excess Volume (FEV) or the total volume of water that cause the flood which eventually need to be mitigated.

Aims:

- Create the hydrographs (3 panels graph which shows correlation between time, height and river flow) on excel and analyse the graph to obtain the Flood Excess Volume (FEV).
- Investigate different flood-mitigation schemes, include the cost and feasibility of each scheme.

Results/Current stage:

- Obtained and analyse the data. Implement FEV formula (Blue shaded area) and code in Excel to receive the graph with 10% error rate (grey shaded area).

- Find one alternative mitigation plan that include 4 different schemes such as build reservoir upstream, 0.6m flood walls, tree planting and build floodway. (include cost per %)
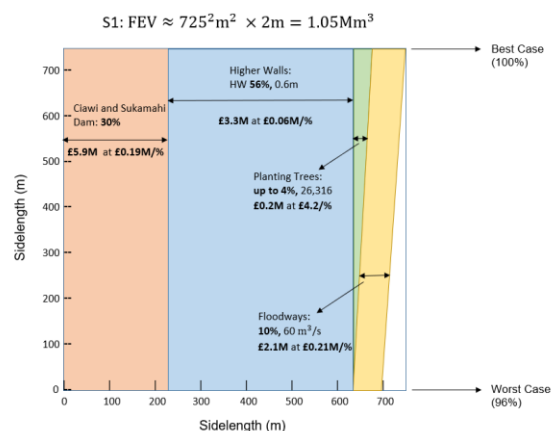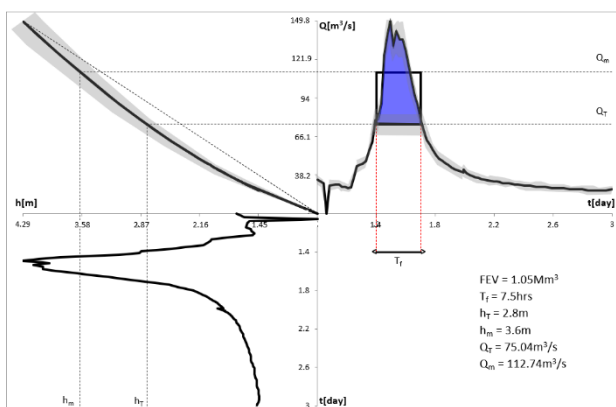
Future work:

- Get the proper error rate and plot it. (Already emailed the EA)
- Put more alternative plan for the mitigation scheme.

Reference:

[1]https://books.google.co.uk/books?hl=en&lr=&id=UcXXmiFdP1QC&oi=fnd&pg=PR7&dq=sejarah+banjir+ciliwung+jakarta+skripsi&ots=ariOy5MCP3&sig=XRUEYyPKnTwQr6z2_G0lSdnRUMM#v=onepage&q=sejarah%20banjir%20ciliwung%20jakarta%20skripsi&f=false

[2] https://data.jakarta.go.id/dataset/data-tinggi-muka-air-dki-jakarta-tahun-2020