CIVIL 466 - Water resources engineering and management

Practical Work : Case study - Hydropower optimal water allocation and financial study

Spring 2024

Groupe 2 :

Moea Geffard Lemaître
Matteo Thomé
Pierre Demey
Margaux Cochard

Supervisors :

Junjia Kang
Giulio Calvani

1 Introduction

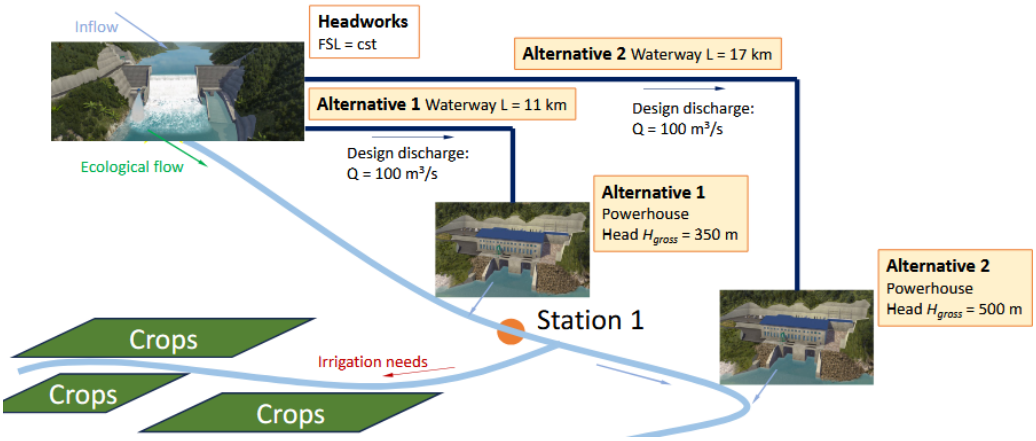

FIGURE 3.1 – Diagram presenting the two alternatives.

2 Gross water need

2.1 Irrigation net water need

The mass balance equation relates the water stock variation with incomes and outcomes :

$$\Delta S = Q_{in} - Q_{out} = P - Q - Irr - ET$$

Neglecting losses nor interception during precipitation and considering the reserve

3 Optimal water allocation

In this part, we will perform numerical simulations to assess two project alternatives from both ecological and energetic efficiency standpoints. The objective is to construct the Pareto frontier and evaluate the proposed allocations based on their proximity to this frontier. This analysis will be conducted for each project alternative individually, resulting in two separate simulations, and will account for both wet and dry year periods.