Consideration of target safety level for seawall to protect against tsunami

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"How safe is safe enough?" is a question which is frequently asked and difficult to answer. It is especially difficult when making a decision about low-frequency high-consequence risk. Conventionally, life safety, e.g., death rate, is a major concern when discussing and make a decision about the target safety level. Recently, it is beginning to be recognized that other viewpoints, such as economic consideration or regional continuity, might be critical, especially when the indirect consequences in case of failure are much larger than the direct consequences. In this study, a decision making about target safety level of engineering system against low-frequency high-consequence event is discussed. Safety level of seawall, i.e. seawall height, is used as an example, which is going to be reconstructed along the coast of tsunami inundated area during Tohoku Earthquake in 2011 to protect against future tsunamis. Life quality index is used to discuss the minimum life safety level of seawall. Then, it is compared with the optimal safety level obtained from the economical optimization.