藉可靠度分析探討不同規劃時期設計流量之決定

In practical planning for river improvements, the estimated design discharge was usually different according to different length of the data that was depended on design timing. For safety reason, the planners usually selected the larger value of estimator for the design discharge without worrying about the data length. In statistics, however, this way is not only in contravention of the method that the longer data length, the estimator is more precise, but also may not be economical. This study uses two methods to analysis the reliabilities of the estimated values from the shorter length of data, the estimated value from the longer length of data, theoretical value and the accuracy of the two estimated values comparing to the theoretical value. The first method is called points estimated method. Whether the estimated value from the shorter length of data is larger than that from the longer length of data or not, the probability of estimated value from the longer length of data in safety design is larger than those of the other two; The second method uses interval estimation. In order to solve the unreason results which is caused from a single value by using the pointed method, we chose the interval a=0.1, 0.5 to calculated the estimated values from the longer length of data. In each set of synthetic data, the first fifteen values are taken as the shorter length of data. The number of longer length of data will be sixteen increasing to forty-five. By means of several kinds of distribution functions and return period to analysis the reliability, the result shows that the reliability is between 0.6 to 0.95 when the longer length of data is chosen. So, no matter the estimated value of design discharge of longer data is smaller than that of the shorter one or not, as long as we chose the longer length of data, we will have safety design of river discharge in planning for the river improvement.