Abstract—Dam-break wave simulation over erodible embankment with steep slope topography using shallow water-Exner model has been studied by several researchers. For instance, in Makoto D. Ambara et., al., the semi-implicit staggered grid scheme is used to approximate this model. The results are shown good comparison of numerical result and experimental or observation data. In this paper, the parallel computing for minimizing the CPU time of the SWE-Exner model approximation is elaborated. Here, OpenMP is used to execute the program of erodible dam-break wave simulation in parallel and gives the information about speedup and efficiency with 2 different computers. As the results, computer with AMD Rayzen(TM) 2400 has the best result for speedup with 3.6821 times faster than serial and efficiency 92.0530% when the final time at t = 60s and Nx = 6400 points. Meanwhile, using computer Intel(R)Core(TM)i3-6006U, the speedup and efficiency of parallel computing is obtained 2.03233 times and 50.8083% of serial computing respectively.