

## Modelling of Reservoir Network For Flood Control Using Nonlinear Reservoir Routing Model

### Abstract

Network of reservoirs has become a standard hydraulic construct for multipurpose use. In this work, we present a formulation based on nonlinear reservoir method and coupled tank approach to model the reservoir network for flood control. The network of reservoirs consists of both detention and retention pond which give rise to nonlinear system of ODE for the  $m$  reservoirs in the network. The inflow consists of rainfall runoff in each sub catchment and discharges from the adjacent reservoirs. On the other hands, the outflow consists of infiltration and discharges. The nonlinear system obtained is linearized about the normal operating height of each reservoir in the network. The discharge term on the last equation is dropped in order to allow all the runoff captured into it. The establishment of relationship between the area of catchment and area of reservoir give room for the estimation of the forcing function in terms time of concentration rather than in terms of area of the reservoir which is difficult to obtain in an existing network. Two sets of solutions are presented, one at the convergent point and the other the best solution in respect of the lowest point in the reservoirs.