The present study investigated the sedimentation problems in Masinga Reservoir. The study investigated the possible contribution of sedimentation by human activities in the catchments, the amount of sediment is distributed, and finally the expected life span of the reservoir.

Sediment concentration data for five River Gauging Stations (RGS) upstream Masinga Dam were used for analysis. In addition to these, hydrographic reservoir resurvey data were used in computing the actual sediment deposited in the reservoir for the first seven years of impoundment (1981 to 1988).

Short-term sediment rating curves were drawn for each RGS for the period 1981 to 1984.these were used together with their corresponding long-term flow-duration curves for the period 1970 to 1984 in computing the total sediment inflow into Masinga Reservoir.

The results obtained for the total sediment discharging into Masinga Reservoir was used in computing both the trap efficiency and the expected economical life of the reservoir.

A program, MARESM (Masinga Reservoir Sedimentation Model), as developed by the author and based on Constant Factor Method was used in computing the actual sediment deposited in the reservoir for the period 1981 to 1988.

The present study revealed that:

(a) The total annual sediment inflow into Masinga Reservoir is less than the actual volume of sediment deposited (8.6×10^6 m^3 and 13.3×10^6 m^3, respectively).

(b) The trap efficiency of Masinga Reservoir wall range from 98% to 75% during its expected economical life, in which 90% of its original capacity will have been lost;

(c) The expected economical life of Masinga Reservoir is some 200 years;

(d) On the average, Masinga Reservoir lost about 6% of its original capacity during the first seven years of impoundment; and

(e) Most of the sediment deposition has occurred within the backwater region and areas in which tributaries and ephemeral streams join with the reservoir.

From the findings of this study, it is recommended that future studies should be based on the determination of the actual sediment already deposited in the reservoir, with special reference to the contribution by the ephemeral streams to reservoir sedimentation.