

## Abstract

This research examines agronomic and socio-economic factors influencing soil erosion in the Masinga dam catchments. The study addresses soil erosion from a human point of view as opposed to the common and widespread "physical approach" that has in the past been used by many scientists. The following two null hypotheses formed the basis of this research; (i). There is no significant difference in the amount of soil loss between farms under different agronomic practices; and (ii). There is no significant difference in socio economic status between farmers whose farms are experiencing less and severe soil erosion in the study. Three sets of data including socio economic, agronomic and soil loss were collected from Kaihungu and Mathauti Sub-catchments in the Upper and Lower parts of the Masinga Dam Catchments. A questionnaire was used in the collection of the socio economic data and part of the agronomic data. Crop cover was estimated by visual observation while crop density was calculated from crop spacing measurements taken in the field. Soil loss data was collected using 26 soil traps during the Long and Short Rainy Seasons of 1992. Composite topsoil samples were collected from the upper decimeter of 26 sites. These were used in the determination of soil texture and fertility. Two non-parametric tests namely, Chi-square ( $\chi^2$ ) and Mann-Whitney U test analysis, there was not a significant difference in the amount of soil loss between farms under different crops and cropping patterns. That is, soil loss was high in farms where monocropping or intercropping was practiced. Similarly, soil loss was high in farms with medium crop density as well as in those with low and medium crop densities. The explanation for these findings is that none of the sampled farmers practiced a combination of all the required appropriate agronomic measures. Many of them adopted one or a few of the good agronomic measures thus making soils vulnerable to agents of erosion. The Chi-square ( $\chi^2$ ) results reveal that a large number of the farmers (88%) whose farms had a severe soil erosion problem experienced numerous intricate socio-economic problems hindering them from practicing the recommended soil conservation measures. These results indicate that there is a significant difference in socio-economic status between farmers whose farms experienced less severe and severe soil erosion in the Masinga dam catchments. On the other hand, farmers experiencing severe soil erosion were poverty stricken and resource poor. They owned small and fragmented farms, and had little or no access to extension services and credit and had little or no on-farm and off-farm income. On the other hand, however, the few farmers who did not experience severe soil erosion had relatively high on

and off-farm incomes, relatively large farms, access to agricultural extension services and were generally highly educated. The implication here is that the progressive farmers have surplus land and working capital. These can be contrasted with the "resource poor" farmers who can hardly invest on soil and water management in their farms. Based on the findings of this study, it is recommended that sustainable short and long-term solutions to soil and water management problems among the resource poor farmers be sought. These should initially take the form of increased subsidies and incentives among the farmers. Also, it is paramount for academicians to conduct more research in order to monitor and quantify the rate of soil erosion in the entire catchments from bare grounds should also be determined.