

Production of organic fertilizer from water hyacinth (*Eichhornia crassipes* [Mart.] Solms) for organic farming and conservation of ecosystem in Lake Victoria basin

ABSTRACT

The Lake Victoria Basin (LVB) supports one of the poorest and most populous rural populations in the East Africa region. The increase in population and the dipping fish population, has forced the community around the Lake Victoria to seek alternative sources to complement their daily food needs. This has made large scale farming for food crops an imperative option to enable the community meet its daily food demands. Repeated use of the soil around the lake for large scale farming has led to deterioration of the soil quality and massive erosion. Chemical fertilizer which is readily available has been the alternative source of improving soil condition. Repeated use of chemical fertilizer in the catchment areas and around Lake Victoria has led to eutrophication of the lake waters causing the temperature to rise in the process affecting most freshwater animals. This process also encourages large volumes of algae and other biomass such as water hyacinth to flourish and in the process consume all the oxygen in the water causing ecological and social-economic problems, death of fish and other creatures in the water ecosystem. There is therefore an urgent need to revolutionize the agricultural systems by using alternative ecologically friendly and sustainable source of soil nutrients. With the right type of agriculture, emissions leading to climate change can be minimized and the capacity of nature to mitigate climate change can be harnessed to sequester significant quantities of atmospheric carbon dioxide especially in the soil. Global adoption of organic fertilizer has the potential to sequester up to the equivalent of 32% of all current man-made Green House Gas (GHG) emissions. Use of organic fertilizer sustains the health of soils, ecosystems and people. Water hyacinth is a free floating water plant which is predominant in Lake Victoria. The plant is also persistent and troublesome in the lake. Decomposition of this plant can act as a sustainable source of organic fertilizer considering its high turnover. This project intends to set up simple pilot facilities for decomposing water hyacinth in Kenya, Rwanda and Uganda to produce organic fertilizer. The fertilizer will be used by farmers around the lake and its environs to assess how effective it can be in crop production. Molecular biology techniques and morphological characterization will be used to identify common bean rhizobia in composite testing field in the Lake Victoria environs. Data for the study will be analyzed using ANOVA and means separated using Tukey's test at 5% level.