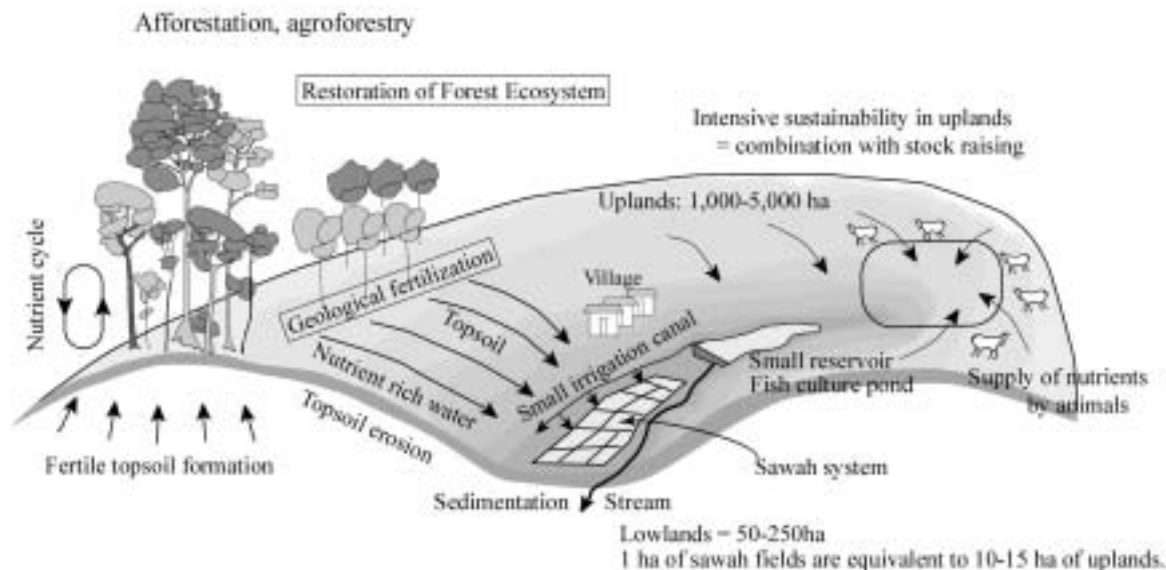


**Benchmark sites and concept of this research (本研究の実証調査地と集水域生態工学の基本コンセプト図)**



**Fig. 1. Two benchmark watersheds in Ghana and Nigeria countries with major ethnic groups in West African**



**Fig. 2. Watershed Ecological Engineering: Integration of Forestry and Sawah in a unit Watershed. Sawah is a functional constructed wetland.**

Fertile topsoil formation in forest ecosystem and sedimentation of eroded topsoil in lowland Sawah are the Geological Fertilization Process. The geological fertilization and well known biophysico-chemical processes under the submerged irrigated Sawah enhance the intensive sustainable productivity of Sawah system. As the results one hectare of Sawah has sustainable productivity equivalent to 10-15 ha of upland fields (Sawah hypotheses).