

Social-ecological Learning, Indigenous Knowledge and Innovation as means for addressing the vulnerability, adaptation and resilience to change in the dependence on ecological systems, by artisanal fishers of the African Great Lakes Region: the Lake Victor

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Up to the early 60's, way after the time of the European expeditions (e.g. the Royal Expeditions), the ecological systems around the basins of the African Great Lakes, consisted of pristine equatorial vegetation (e.g. mahogany) and high quality waters (e.g. pH of 6.5-8.5); these natural resources held their conditions. Human population was small (e.g. about 8 million in Kenya), with a very low recruitment (e.g. average of 3 children per mother) due to several tropical disease infections (e.g. malaria); marrying more than one wife was associated with wealth and possession of wide land. Crude artisanal fisheries included fish such as the endemic tilapia (e.g. *Oreochromis variabilis*); the diversity of fish faunal was rich (e.g. over 500 species recorded for Lake Victoria, Kenya). Dominant fishing gear was the reed-kraal and vessel, the tree-trunk dugout; artisanal fishers never ventured off-shore in order to harvest the required fish tonnage. Then, there was an about turn beyond the early 1960's, after the introduction into Lake Victoria of the Nile perch (*Lates niloticus*) fishery. The fishery took place in off-shore areas, thus, requiring large wood-paneled vessels (e.g. canoes), efficient fishing gear (e.g. nets), and more labor intensity. The huge-bodied Nile perch was blamed for including smaller fishery in its diet and thus contributing to their (e.g. *Haplochromis*) depletion. Clear-forest activities began: wood was needed to smoke-dry (preserve) the oily Nile perch meat and to build the large canoes (e.g. outboard motored). As a result of exposing the once pristine forest land to direct solar radiation, top soil cracked, lost water table and got eroded and lost. Normal conditions harboring many tropical water borne pests and diseases got discouraged. Human population exponentially (e.g. birth rate of 4 for Kenya; 2010 population is nearing 40 million) increased, resulting in further forest clearing and burning (e.g. the East and Central Africa carbon emission contribution) for agriculture. Due to the economic growth afforded to people by the booming Nile perch and agricultural industries, a new pattern in the number of wives to marry and children to bare by each artisan changed (e.g. average of 3 wives per man and 5 children per wife). Riverine and lacustrine (shore line) fisheries also declined due to siltation. In 2010, the natural Lake Victoria fisheries are declared 'dead' by the artisanal fishers; and any observer can see the forests sprouting back. Poverty has prevailed and the artisanal fishers no longer practice efficient polygamy. In order to cope with the change in the social-ecological systems, the fishers have embarked on the use of indigenous knowledge in improving fishing vessels and gear, beyond the scopes of the governing maritime policy or law. The Government of Kenya has responded by encouraging the artisans to invest in skills for pond aquaculture or lake cage culture. International (and Diaspora) partnership is highly encouraged to take advantage of the climate conducive for aquaculture in the Africa Great Lakes Region. The paper is aided by statistics in tables and figures (i.e. charts, graphs, photos and illustrations) where appropriate.