

# Acadja Fisheries Enhancement Systems in Benin: Their Productivity and Environmental Impacts

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AcadjaS are "brush park" type installations that are found in several West African coastal lagoons (Welcomme 1972). In Benin, acadjas originated in Lake Nokoue and the Porto-Novo lagoon complex at the beginning of the century. They continue to flourish in some of the lagoons in Benin, where fish production by acadjas represents between 15 and 30% of fish landings. The number of acadjas in Lake Nokoue and the Porto-Novo Lagoon was estimated at 12218 in 1996, covering an area of 6691 ha (Gbaguidi and Djanato 1997). Welcomme (1972) reported 6407 acadjas (surface area 156 ha) in 1970. In 1959, there were 35661 acadjas covering 433 ha. Acadja fish production in the two lagoons totaled 4 060 t in 1959, 838 t in 1970 (Welcomme 1972), and 6134 t in 1998. While the number of and areas covered by acadjas have increased, their productivity has decreased: 5.625 t.ha<sup>-1</sup>.year<sup>-1</sup> in 1959; 3.9 t.ha<sup>-1</sup>.year<sup>-1</sup> in 1970; 4.1 t.ha<sup>-1</sup>.year<sup>-1</sup> in 1981; and 1.92 t.ha<sup>-1</sup>.year<sup>-1</sup> in 1998. One of the principal causes is the yearly decrease of the density and the quality of branches used to make acadjas. Welcomme (1972) reported the use of 12 to 16 branches.m<sup>-2</sup>. Nowadays this density is 3-7 branches.m<sup>-2</sup> and the wood used is not from the same hard species as before.

Acadjas function by artificially replicating the habitat favored by certain fish spe-

cies. They offer shelter from predators, suitable places for breeding and, above all, a high abundance of food: as periphyton on the surface of the branches and as a bottom fauna enriched by decaying wood. *Sarotherodon melanotheron* is the dominant species (77.3%) caught. The total length of individuals caught in acadjas varies from 9 to 30 cm (mean 17.4 cm; n = 589). The second and third most dominant species in the catches are *Chrysichthys nigrodigitatus* (17.3%) and *Tilapia guineensis* (2.1%).

One of the advantages of acadjas is the possibility of natural restocking of the environment. Acadjas spread fish larvae and fry around the entire ecosystem. As a result, the yields of fishes caught with nets and through other fishing techniques near the acadjas in the lagoons of Benin have improved. However, acadjas have some negative environmental impacts. The mangroves of lagoons in Benin are being destroyed to supply wood for acadjas and this deforestation continues in other areas of the country. Moreover, water flows and exchange in the ecosystems with acadjas are reduced because of the accumulation of branches. This also accentuates pollution. These problems could be solved partially by establishing wood plantations around the lagoons and the reorganization of this fishing method.

## References

- Gbaguidi, A. and M. Djanato. 1997. Enquete cadre plans d'eau du enin. D/Peches. Cotonou, Benin.
- Welcomme, R. 1972. An evaluation of the acadja method of fishing as practiced in the coastal lagoons of Dahomey (West Africa). *I. Fish BioI.* 4:39-55.

## Discussion

*Ms. Entsua-Mensah:* How successful has been the program of replanting mangroves in Benin?

*Dr: Laleye:* It has been going on effectively.

*Dr: Kouassi:* Do you limit the size of the fish that are caught in the acadja?

*Dr: Laleye:* The size depends on the species and the net that the fishers use to fish in the acadja. With *S. melanotheron*, there is no problem with the size as they are good-sized fish, but with *Chrysichthys*, 70-80% of them are caught before they attain first maturity.

*Mr: Agbogah:* In efforts to replant mangroves, did you consider the idea of providing woodlots, especially using acacia?

*Dr: Laleye:* We have provided these, but the fishers insist that the mangroves are better; hence, they continue to cut them.

*Mr: Kwarfo-Apegyah:* Is acadja a system of culture? Are the benefits of acadja more than the environmental damage it can cause? Should you continue advocating its use?

*Dr: Laleye:* It is not aquaculture because in aquaculture you are sure of what you culture, and that is not the case with acadja. I think acadja is good as long as the fishers are well organized. As for the benefits, acadja ensures that there will be some production from the waterbody.