

Appendix 2:

Investigations in the Sakumo Lagoon, 1971, by Daniel Pauly

Following an invitation by Mr. E.A. Kwei, then Project Director of the Fishery Research Unit, to the author, an investigation of a small lagoon near Tema, the Sakumo Lagoon, was conducted from August to December 1971. During his stay in Ghana, the author was given manifold and friendly assistance by the various staff members of the Fishery Research Unit which is here gratefully acknowledged. The results of the investigation are summarized below. Numbers in brackets refer to the publications.

- a. The lagoon, of 1 km^2 surface area, was defined as "semi-closed". Because of its permanent, but limited communication to the sea, it belongs neither to the "open", nor the "closed" lagoon type. Salinity cycles and rates of water exchange with the sea resulting from this are presented. (1, 3)
- b. Some data for dissolved oxygen, seston, turbidity and primary productivity are given. (1, 3)
- c. The occurrence, distribution, and to a lesser extent the migrations and food of 25 species of benthic animals (annelids, crustaceans, molluscs) are discussed. (1, 3)
- d. 16 fish species or genera were found in the lagoon. In the course of the investigation, 4 groups of fishes

emerged:

- i. fresh-water fishes occurring only during the rainy season (e.g. Clarias).
 - ii. permanent inhabitants of the lagoon (e.g. Tilapia melanotheron)
 - iii. juvenile stages of marine fishes swimming into the lagoon after the rainy season (e.g., Mugil)
 - iv. marine fishes coming for short incursions into the lagoon (e.g. Lutjanus). Their food, average length and weight, their intestinal ratio are given as well as a representation of the food web in the lagoon. (1, 3)
- e. The food of Tilapia melanotheron, bottom mud, was studied, using mainly quantitative methods. The caloric and organic content, the grain size composition and the weight of the ingested mud were determined. The total amount of mud ingested daily and the feeding periodicity were determined by indirect methods. Other biological data are also given. The autecology of the fish is discussed. (1, 5)
- f. Samples of T. melanotheron infested with a parasitic copepod were handed over to a specialist who described the copepod as Paeonodes lagunaris nov. spec. (2). The infestation rate and intensity of P. lagunaris in the buccal cavity of T. melanotheron decreased with increasing salinity in the lagoon and with the length of the fishes. These phenomena

- were described quantitatively and discussed. (3)
- g. The fishery of the lagoon was described. A catch of 150 kg/ha/year was estimated, with a catch/unit effort of less than 1 kg/man/hour and a fishing intensity of 70-man hours/day/km² during the period of investigation. More than 90% of the catches consisted of T. melanotheron. The selectivity of the nets in use was shown by means of the condition factor (cf) of T. melanotheron. (1, 5)
- h. A scheme of extensive stocking of closed lagoon with fry (Mugil) caught by seine-netting along the coast is proposed as a possible means to increase the catches in those lagoons and as a first step toward their aquacultural use. (1, 5)

References:

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