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ECOSYSTEM-BASED FISHERIES MANAGEMENT: THE ROLE OF THE SIAP PROJECT[2]

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While pre-industrial fisheries in Africa and elsewhere usually had the capacity to extirpate some freshwater and coastal fish populations, it is only since the advent of industrial fishing, about a century ago, that the sequential depletion of coastal then offshore populations of marine fish has become the standard operating procedure.

In the late 19th Century, in the North Sea, where British steam trawlers were first deployed, it took only a few years for the accumulated coastal stocks of flatfish and other demersal groups to be depleted, and for the trawlers to be forced to move on to the Central North Sea, then further, all the way to Iceland.

This European expansion and a similar process emanating from North America led after the Second World War to massive increases of fisheries catches in the North Atlantic, the North Pacific, as well as in South East Asia and Northwest Africa. By the late 1990s, the last large shelf areas previously not subjected to trawling had been depleted, as were most of the oceanic seamounts. All that is left now for further expansion of bottom trawling are very deep (1-3 km) populations of demersal fish, whose extremely low growth rates, associated with life spans of over 100 years, essentially precludes sustainable exploitation. Hence, in the absence of legal protection, they are subjected to 'pulse-fishing' by distant water fleets of various industrial countries, i.e., to rapid depletion of their biomass, without even the pretence of some form of responsible fishing. In any case, these 'new fisheries' cannot mask the decline of global fisheries catches that occurred in the 1990s (visible if one ignored the Chinese marine fisheries catches, which are actually far less than reported officially to FAO).

Similarly worrying trends are occurring in open water ecosystems, where long-lining for tuna and other large pelagic fishes depletes these systems of large predators including sharks, now feeding an insatiable Asian soup fin market. Also, purse seining around floating objects (i.e., natural or artificial fish aggregation devices) has made previously inaccessible small tunas and associated organisms vulnerable to fishing, thus prompting fears of a drastic decline of fish populations previously thought largely immune to our depredations.

The change in demersal and pelagic ecosystem structure resulting from such serial depletions can be quantified in various ways, one of them being through the decline of the trophic level in the landings of fisheries. This establishes that catches in most parts of the world, including North West Africa, are not sustainable, as they increasingly rely on fish originating from the bottom of marine food webs, i.e., on the prey of larger fishes.

Considering these and related trends will require a move away from the single-species assessment and management discussed above, toward what is now known as 'ecosystem-based management.' Notably, this requires leaving enough 'forage fish' for exploited populations of large predators (if these are to remain an exploitable resource). Moreover, ecosystem-based management will require routine use of marine

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protected areas (with no-take zones at their core) to allow rebuilding and maintenance of now depleted populations of slow-growing fishes.

For such management to be put in place, a convincing case must be made that the bleak picture of global fisheries presented applies to the region for which a change in management regime is being proposed.

This defines the task of the EU-funded project "Fisheries Information and Analysis System" usually referred to under its French acronym SIAP (Système d'Information et d'Analyse des Pêches), covering the sub-region that includes the Cape Verde, Gambia, Guinea, Guinea-Bissau, Mauritania, and Senegal (to which Sierra Leone has recently been added), and which is devoted to assembling and analysing the extant and historic data usable for assessing the status of the fisheries, fisheries resources and ecosystems in the member countries.

For this purpose, SIAP was designed, via its three main modules, to access three key types of data: (1) times series of catches, more detailed and complete than those supplied by the governments to FAO, and contrasting the lower catches of large specimens of high-value species made previously with the often high catches made presently of lower value fish species, and of invertebrates; (2) time series of abundance from historic trawl surveys, commonly indicating much reduced fish biomasses on the major fishing grounds of the member countries; and (3) diet composition and other biological data, used in conjunction with the data in (1) and (2) to construct trophic (Ecopath) models of each of the member countries' major fisheries ecosystems.

Jointly, the results of the analyses to be conducted in these three modules will provide, for each country, a reliable synthesis of the long-term impacts of fishing on the marine ecosystems of the region, and hence of the option still available for their sustained exploitation.

Thus, the SIAP project will help choose between two futures: one which would continue with business as usual, including the present trends of capacity and serial depletion of fisheries resources, as manifested in the fishing down marine food web phenomenon, and as occurs in the region. The other would lead to a form of fisheries management involving strong action being taken to maintain the ecosystems upon which the fisheries are based. This would include ecosystem-based criteria for the operation of local fisheries, and the licensing of foreign ones, and a strong reliance on spatial closures (including relative no-take area) as a tool for resource conservation.

The SIAP project has organized, with a number of partners, an international symposium, held in Dakar, in June 2002, at which these options and their biological, economic and societal implications were debated. We hope that the SIAP project as a whole will be as successful as this symposium was.