

Contribution of complex systems approaches to the development of a research capacity for the fishery sector in Guinea (West Africa)

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Fishery sectors are complex organized sets of diverse items, ranging from the nutritive plankton to the contents of the consumer's plate. In the management of these systems, complexity is generally considered as a source of variability or uncertainty that must be overcome, rather than an essential property. We present here a project for the building of a research and information capacity for the fishery sector in Guinea (West Africa) designed according to principles inspired from the complex systems approach.

The project and Guinean fishery sector were considered to be hierarchically embedded complex adaptive systems. A research system was designed as a set of adaptive research operations, each considered as a semiautonomous agent shedding light on a given aspect of the fishery sector. The project was considered as a construction enclosed in its own history (ontogeny) and we deliberately distributed operations so as to provoke the emergence of a final global outcome. Emphasis was placed on the environment of the research system more than on the realization of each operation. The aim was to make it possible to generate opportunistic contexts, which could be captured through the adaptive nature of the operations. Inspired by the fractal structure of some systems, we applied the same set of principles at all levels, from individual research actions to the whole system project and the entire fishery sector.

The system of operations led to a better understanding of the integrated dependencies of the fishery sector, a significant increase in the reactivity of research to new problems and challenges, the suggestion of integrated groups of actions, a wider audience for the dissemination of results and a common platform for discussions between the various stakeholders. Methodological questions are linked to this approach such as the necessary gamble on the production of unexpected emergent outcomes or the possible means to develop opportunistic contingencies.