

From New Atlantis to New Alliance: Society, Science, Governance and the Ecosystem Approach to Fisheries

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At the onset of the third millennium, the world fisheries are ongoing a progressive change that affects science, governance and the sector itself as the Ecosystem Approach to Fisheries (EAF) is slowly being implemented. In this necessary and difficult endeavour, the fishery sector is not alone. The poor performance of fisheries is only one element of a general diagnosis of failure in sustainable use of all renewable resources and a worrying degradation of the human environment, illustrated by the recent Millennium Assessment. Altogether, the future looks grim and dark prophecies of cataclysms of biblical magnitude, to happen within a century, are being made regarding the fate of terrestrial, oceanic and atmospheric environments.

To some extent, the situation recalls the end of the first millennium, when Armageddon and the Last Judgement were expected to happen. Both before, during and after these periods of tense societal concern about the future of Nature and mankind, philosophers, religious leaders and scientists have argued about the nature of science, its interaction with government, societal values and religion and its role in the betterment of society. The myth of Atlantis in the Antiquity and the vision of Francis Bacon in the New Atlantis, in the 17th century, are examples of the myths and utopias developed as a response. The similarity between the societal principles and epistemological issues contemplated then, in these utopias, and now, under EAF, is striking.

The key epistemological and governance issues underpinning the implementation of EAF results from the recognition of the complexity of socio-ecological systems and the absolute requirement to achieve both the human and environmental wellbeing. This complexity has significant consequences for the science and governance co-evolution as well as the fishing industry. The latter is an issue of importance not dealt with, though, in this presentation.

The effective recognition of the complexity of the fishery system and its interconnections with its broader political, social, legal, and environmental environment requires a series of simultaneous and interconnected shifts towards: (i) more complete and interconnected information systems; (ii) combined use of simple and complex models to deal simultaneously with operational and strategic issues; (iii) a much stronger inter-disciplinary framework for scientific enquiries (iv) strongly participative assessments and decision-making processes, (v) complementing deceptive mathematical predictions with socially elaborated precautionary foresight (vi) elaboration of a broader range of policy options, (vii) stakeholders capacity building for a more effective participation; (viii) institutional oversight, auditing and systematic evaluation of research and management performance. One central implication of this New Alliance (*sensu* Prigogine) is the need to develop a much stronger interface between natural and social sciences, and between them and society through more integrated advisory processes, in a post-modern vision of the science and management relation.

The process of change that has started involves ecosystems clocking on long-term oscillations, evolutionary and other changes. It also involved modifying cultural traits and social behaviour. It can only happen at a speed that is affordable in terms of the resources needed, and compatible with the resilience and flexibility of the human and natural communities involved. One danger is in trying to achieve too much, too hastily, tumbling on institutional or ecological rigidities. Another is in getting discouraged by the perspective, paying merely lip service. The balance needs to be found in affordable transitional pathways for change, in both research and management institutions, compatible with industrial adaptation.