Sea Around Us

Lessons from a reconstruction of catch time series for Mauritania

by Didier Gascuel

For a fisheries scientist, Mauritania is probably one of the world's most fascinating countries. It is a very poor country, a desert for the bulk of its territory. Landing for the fist time at the airport of Nouakchott, the capital, is a shock: how can people live here, in the middle of nowhere?

But in fact, this is a country of very enterprising people, and there are natural resources: large iron deposits in the desert, recently discovered oilfields on the shelf, an intensive upwelling along the coast, and a large, extremely productive shallow, the 'Banc d'Arguin.' As a result, Mauritania's coastal waters are (or have been) among the world's richest fishing grounds, and the fishery sector is of huge importance to the country's economy. In 2005, official landings were estimated at around 720,000 tons, representing 6 % of Gross Domestic Product, generating 30 % of the value of Mauritanian exports and 30 % of the state's revenue (IMROP 2007).

The fisheries statistics available from Mauritania, at least those submitted to FAO, leave much to be desired, however. While a fisheries monitoring system, based on logbooks, sampling at landing locations, and onboard observers has been developed by the Mauritanian national fisheries institute (IMROP) in the 1980s, its implementation has faced difficulties, and a complete database is available only since 1991 for the industrial, and 1997 for the small scale fisheries. Only scattered and heterogeneous statistics were published earlier, covering short periods. I have attempted to harmonize these different datasets, and to generate, in the process, a 'catch reconstruction' (*sensu* Zeller *et al.* 2006) of the industrial pelagic and demersal fisheries, and of the artisanal fisheries, covering the years 1950 to 2005 (Gascuel et al., in prep.).

Seven lessons emerge from this reconstruction

1. Even if estimates remain uncertain, notably for the 1950s and 1960s, the catch reconstruction is extremely useful in that it provides a first picture of long term catch trends by the various fisheries which have exploited (what became) the Mauritanian EEZ. The FAO statistics are really deficient in this regard. The main reason for this is that the bulk of the catch is due to foreign fleets, and thus is not reported by Mauritania to FAO. Of course, the foreign boats have to declare their catches. Their declarations, however, refer to larger FAO fishing areas, not the Mauritanian EEZ. Thus, in FAO statistic, neither the catch by country, nor the catch by area gives information on the catch taken from the Mauritanian EEZ.

2. The results I obtained can be compared with the catch estimates by the *Sea Around Us* project database (see www.seaaroundus.org). The latter relied on Watson *et al.* (2004), who allocated the FAO catch by (groups of) species to ½ degree cells, and regrouped these into different EEZs. This case study of Mauritania was the first

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independent test of the results obtained by Watson *et al.* (2004), and it passed the test with flying colours: total catches in the Mauritanian EEZ from the *Sea Around Us* are very close to my estimates of the official landings of the industrial fisheries (which should roughly resemble the FAO data). On the other hand, a detailed look allows identification of the limitations of the method of Watson *et al.* (2004), which requires local knowledge for validation. Thus, I found that demersal catches off Mauritania were overestimated in the *Sea Around Us* database, while pelagic catches were underestimated. The main reason is the fact that the fisheries history differs between Mauritania and its neighbours, particularly Senegal. Mauritania has no tradition of fishing, and its resources have been exploited by mainly foreign countries targeting the small pelagic fishes. On the other hand, small scale fisheries targeting demersal resources developed very early in Senegal. Thus, the demersal and pelagic catches to be allocated between these two countries do not simply depend on their fishable areas. The method, however, allows for the incorporation of information such as provided here, and thus it should be possible to correct the result in a subsequent catch allocation.

As a consequence, the overall picture of Mauritanian fisheries is strongly modified

3. Several hundred thousand tons of small pelagic fishes, recorded in the IMROP database during the 1980s and 1990s have simply disappeared from the statistics reported to FAO. These had been caught by foreign boats (particularly from Eastern Europe), operating on the basis of special agreements as 'Mauritanian chartered boats.' Thus, they probably should have been declared as Mauritanian catches. But they were not, and neither do they appear (or only partially) in the landings reported by the foreign countries in question.

4. As in many other developing countries, official landings are also underestimated due to a large amount of undeclared by-catches and neglect of the small scale fisheries. Indeed, the latter have always been considered insignificant in Mauritania. This was more or less true before the early 1990s, when a few hundreds 'pirogues' were involved, with annual catches under 15,000 t. However, since then, their number has increased nearly ten-fold, generating catches of around 80,000 t, of which 60,000 t are demersal fish and invertebrates. Obviously, a 'small-scale' fishery of such magnitude is a major economic factor, whose impacts on the ecosystem can no longer be ignored. As for the by-catch, it has been so far ignored because the vessels report overwhelmingly the species they target, and for which they have a license. As if shrimp trawlers caught only shrimps, and the cephalopod fishery only octopus! Taking into account the undeclared by-catches leads to an increase of the industrial demersal catches by a factor of over 1.7.

5. As a consequence, the overall picture of Mauritanian fisheries is strongly modified. So far, it was thought that the industrial fishery for small pelagics overwhelmingly dominated the fisheries sector. While this is still true in term of tonnage (indeed Mauritania has one of the world largest reduction fisheries, where the catch is used for making fishmeal), this may not be true in term of value or value added, as the demersal fisheries

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(industrial and small-scale), catching higher-priced species such as hake, octopus, shrimp, etc., have much higher catch than previously thought.

6. Having established that demersal resources are important, we must then deal with the fact that these resources suffer from tremendous overexploitation. The industrial demersal fisheries developed in the late 1960s, mainly targeting octopus, whose abundance increased at that time, probably due to the previous overexploitation of bottom fish, notably porgies (family Sparidae). Since then, total demersal catches have remained around 180,000 t, albeit with a huge increase of fishing effort. For instance, the number of industrial trawlers grew from around 150 in the early 1980s to 300-350 in the late 1990s/early 2000s. Of course, their fishing efficiency has also increased, which further increased effective effort. In the process, various species groups have been successively exploited, then overexploited. This was probably the case for several fishes belonging to the Sparidae community in the 1960s and 1970s. Octopus has been overexploited since the mid 1980s, which induced a decrease in cephalopod landings from a maximum of 55,000 to presently about 35,000 t. Catches of coastal Scianidae reached their maximum in the 1990s and are now decreasing too. Now, it is turn of the mullet and shrimps. Overall, the demersal biomass has been strongly depleted: at present, it is about 25 % of what it was in 1982, when regular trawl surveys began (Gascuel et al., submitted). This corresponds to the loss of 20,000 t per year.

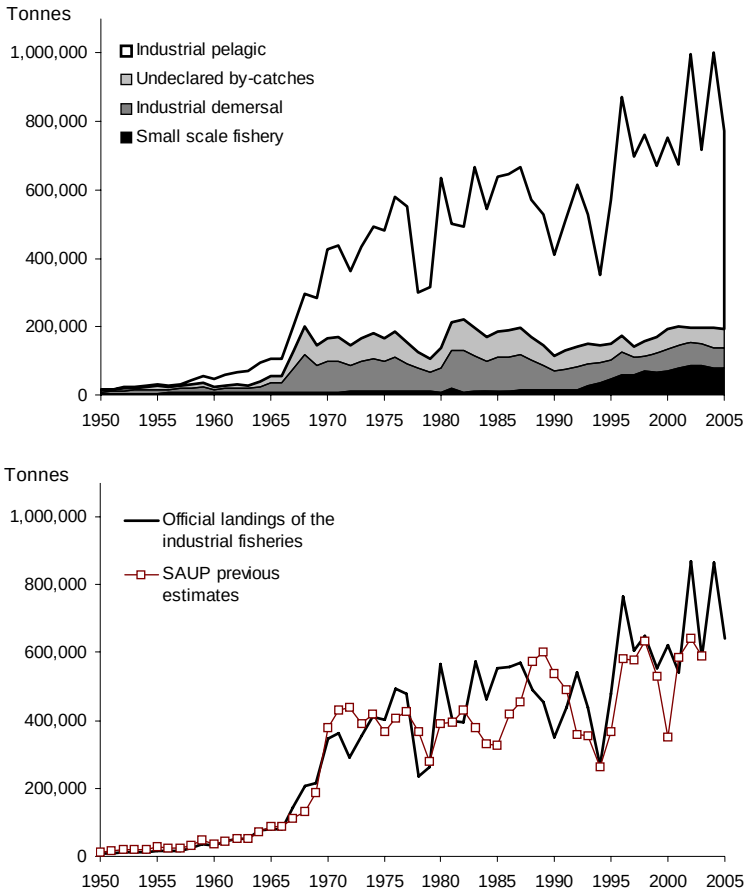

Figure 1 – Reconstruction of the catch time series off Mauritania. Top: desegregation by fisheries. Bottom: comparison with SAUP previous estimates

Mauritania is a very clear case study of an inequitable allocation of fisheries resources

Moreover, the biomass of top predators has been reduced by a factor of 8 to 10 and up to 20 for the most affected species. The mean trophic level of the catch, and its biodiversity decreased, inducing a higher sensitivity to climatic variability.

7. Mauritania is, finally, a very clear case study of an inequitable allocation of fisheries resources. Almost all the large fishing countries of the world have exploited Mauritanian waters. Octopus and demersal fishes have been targeted by Japanese, then by Spanish, Korean and Chinese vessels. Pelagic fishes have attracted vessels from Russia, Ukraine and other eastern European countries and, more recently, Dutch vessels. The Mauritanian industrial fisheries remained limited in spite of several attempts to develop national or joint ventures, especially during the 1980s. Of course, foreign countries have to pay for licenses or fishing agreements. Presently, 30 % of public receipts come from the EU – probably not a good basis for exerting national sovereignty. But the main part of the catches was and is still not landed in Mauritania. Rather, the foreign vessels offload in the Canary Islands (i.e., in Spain), or directly in their country of origin. Mauritania benefits neither through jobs, nor value added. As for the small-scale fishery, we saw that it was very limited for a long time, and that it has developed only since the mid 1990s, partially in competition with industrial fisheries – and

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only after the resources were much reduced.

Conclusion

The context in which Mauritanian fisheries scientists operate, and try to assess stocks and fisheries is thus very challenging. Perhaps the very recent development of an oil industry will make it possible for Mauritania to acquire more weight in international negotiations and to manage its fisheries resources, and the access of foreign fishing fleet to its waters in a more equitable fashion, i.e., so that more of the benefits accrue to Mauritania. There is no doubt that international scientific cooperation will remain useful in this process.

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References

IMROP, 2007. Rapport de synthèse du 6ème Groupe de Travail sur l'évaluation des ressources et l'aménagement des pêcheries de la ZEE mauritanienne. Document Imrop, 26p.

Gascuel, D., *et al.* in prep. The reconstruction of catches data series in the Mauritanian EEZ (1950/2005). *Fisheries Centre Research Repo*rts.

Gascuel, D., *et al.* submitted. The decline of demersal resources in North-West Africa: an analysis of Mauritanian trawl survey data over the last 25 years. Submitted to *African Journal of Marine Science*.

Watson, R., *et al.* 2004. Mapping global fisheries: sharpening our focus. *Fish and Fisheries* 5: 168-177.

Zeller, D., *et al.* 2006. Reconstruction of coral reef fisheries catches in American Samoa, 1950 – 2002. *Coral Reefs* 25: 144-152.

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Selected recent publications

Alder, J., and D. Pauly. (Editors) 2006. *On the multiple Uses of Forage Fish: from Ecosystem to Markets.* Fisheries Centre Research Reports 14(3), 109 pp.

Berman, M. and Sumaila, U.R. 2006. Discounting, amenity values and marine ecosystem restoration. *Marine Resource Economics* 21(2), 211-219.

Chuengpagdee, R., D. Preikshot, L. Ligouri and D. Pauly. 2006. A public sentiment index for ecosystem management. *Ecosystem*s 9, 463-473.

Kaschner, K., R. Watson, A.W. Trites and D. Pauly. 2006. Mapping world-wide distribution of marine mammal species using a Relative Environmental Suitability (RES) model. *Marine Ecology Progress Series.* 316, 285-310.

Morato, T., R. Watson, T.J. Pitcher and D. Pauly. 2006. Fishing down the deep. *Fish and Fisheries* 7(1), 24-34.

Palomares, M.L., E. Mohammed and D. Pauly. 2006. European expeditions as a source of historic abundance data on marine organisms. *Environmental History.* 11 (October), 835-847.

Palomares, M.L.D., K.I. Stergiou and D. Pauly. (Editors) 2006. Fishes in Databases and Ecosystems. *Fisheries Centre Research Reports* 14(4), 95 pp.

Pauly, D. 2006. Major trends in small-scale marine fisheries, with emphasis on developing countries, and some implications for the social sciences. *Maritime Studies (MAST)* 4(2), 7-22.

Sumaila, U.R. and D. Pauly (Editors) 2006. Catching more bait: a bottom-up re-estimation of global fisheries subsidies. *Fisheries Centre Research Reports* 14(6), 114 pp.

Sumaila, U.R., J. Alder, and H. Keith. 2006. Global scope and economics of illegal fishing. *Marine Policy* 30, 696-703.

Watson, R., C. Revenga and Y. Kura. 2006. Fishing gear associated with global marine catches: I Database development. *Fisheries Research* 79, 97-102.

Watson, R., C. Revenga and Y. Kura. 2006. Fishing gear associated with global marine catches: II Trends in trawling and dredging. *Fisheries Research* 79, 103-111.

Zeller, D., S. Booth and D. Pauly. 2006. Fisheries contributions to GDP: Underestimating small-scale fisheries in the Pacific. *Marine Resource Economics* 21(4), 367-386.

Zeller, D., S. Booth, P. Craig, and D. Pauly. 2006. Reconstruction of coral reef fisheries catches in American Samoa, 1950 – 2002. *Coral Reefs* 25, 144-152.

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