

ARE SOUTH AFRICAN ADMINISTRATIVE LAW
PROCEDURES ADEQUATE FOR THE
EVALUATION OF ISSUES RESTING
ON SCIENTIFIC ANALYSES?*

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*This article traces, from a critical perspective, the way in which the various courts that were seized of the matter reviewed the scientific approaches to the allocation of fishing quotas for sardine and anchovy in *Foodcorp (Pty) Ltd v Deputy Director General, Department of Environmental Affairs and Tourism: Branch Marine and Coastal Management & others*. The article explains the scientific basis that underpinned the allocations (Total Allowable Catches) made by the Department of Environmental Affairs and Tourism in terms of the Marine Living Resources Act 18 of 1998 in the early 2000s. It then considers the approach adopted by both the Cape High Court and the Supreme Court of Appeal to these allocations. In all except the first of these cases, the courts found the allocations to have been irrational in terms of the requirements of administrative law. The authors argue that this occurred because of a failure on the part of the respective courts to understand the science behind the quota allocations. The authors argue that there is a need for courts to be more open to seeking guidance from experts in the scientific community to ensure that these issues are properly understood in the future.*

I INTRODUCTION

Fisheries management issues brought on review before courts are typically multi-faceted, often involving scientific elements, and it is probably true to say that courts worldwide generally rule on the basis of whether due process was followed in arriving at their decisions. Such judgments under administrative law do however reasonably admit wider consideration in extreme

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circumstances, where it can for example be argued that the administrative decision made was manifestly irrational or unreasonable.¹

The cases under discussion below concern the setting and allocation of Total Allowable Catches (TACs) for the South African fishery for sardine and anchovy by the Department of Environmental Affairs and Tourism (DEAT). They are of interest (certainly to the scientific community at least) because, it will be argued, the Supreme Court of Appeal (SCA), and subsequently the Cape High Court, apparently failed to realise that their decisions overrode scientific analyses that had twice been subject to review by leading world scientists in the field, and did so on the basis of arguments readily demonstrated to be mathematically flawed.

This article gives an account of the sequence of events involved,² and then makes a suggestion for an improvement to procedures to better guard against repetition of such (arguably flawed) judgments in similar cases in the future.

II SETTING TACs FOR THE SMALL PELAGICS FISHERY

The regulation of fisheries in South Africa takes place under the Marine Living Resources Act.³ Section 2 of the Act sets out objectives and principles, which include the needs 'to achieve optimum utilisation and ecologically sustainable development' and 'to apply precautionary approaches in respect of the management and development' of marine living resources. The requirement for sustainability is usually effected through the determination by the Minister (typically annually) of a Total Allowable Catch (TAC) for a species, in terms of s 14. This is the maximum quantity of that species that may be caught during a twelve-month period (the usual period to which TACs apply) by the combination of all fishing sectors (eg commercial, recreational and subsistence). Under s 19, the Minister may grant rights to fish within a sector, but only for a fixed period of time. This then necessitates a process of allocation from time to time to successful applicants for rights to fish a certain species within the limitations set by the TAC, with a quota being allocated to each such applicant. The account that follows relates to this process of allocation for South Africa's major commercial fishery for small pelagic fish for the period 2002–2005.

The TACs for sardine and anchovy, the two dominant surface-shoaling species in this small pelagics fishery, are set on the basis of research vessel surveys conducted twice a year, which use hydro-acoustic methods to estimate fish abundance. The formulae developed to convert these survey results into TAC recommendations are known as Operational Management Procedures (OMPs).⁴

¹ See the Promotion of Administrative Justice Act of 2000, ss 6(2)(e)(vi), (f)(ii) and (h); and see generally Cora Hoexter *Administrative Law* 2 ed (2012).

² Not every event in what was a complex sequence is reflected below, but those omitted are not seen to be key to the main points at issue.

³ Act 18 of 1998.

⁴ See for example A D M Smith, K J Sainsbury & R A Stevens 'Implementing effective fisheries-management systems — Management strategy evaluation and the

Ideally, catches of sardine would be restricted to the larger adult fish, as only these are suitable for the more lucrative canned fish market. However, a difficulty arises because some bycatch of juvenile sardine is unavoidable in the fishery for anchovy, for which the product is almost exclusively fishmeal, which has a lower value per ton than canned sardine. Thus, a trade-off choice arises. For the same level of biological risk to the resources, the directed (mainly adult) sardine catch can be increased, provided that there is a compensatory decrease in the bycatch of juvenile sardine with anchovy, which in turn necessitates a decrease in the amount of anchovy that can be caught (and, naturally, vice versa).

This is illustrated by the trade-off curve for the average over time of the future annual TACs to be expected for the formulae in use from the 1999 season (OMP-99)⁵ — see Fig. 1.

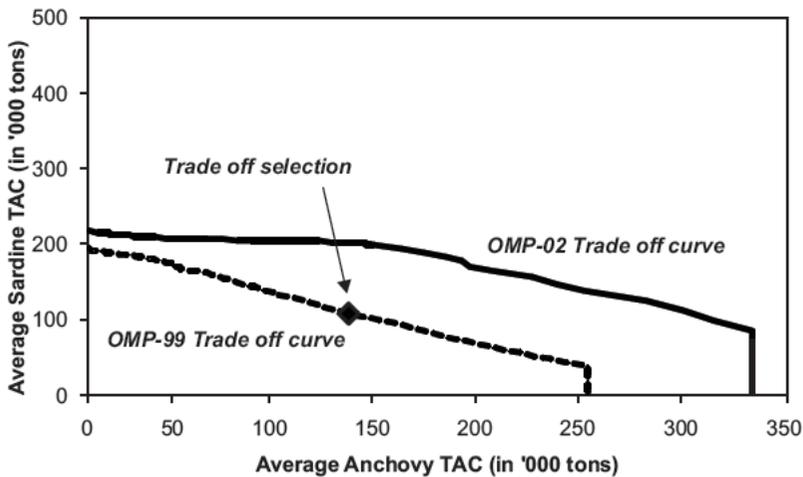


Figure 1. The anchovy vs adult sardine trade-off curve for the average over time of the future annual Total Allowable Catches (TACs) to be expected, as evaluated in 1999 and in 2002. The point indicated on the former reflects the trade-off selection made for implementing OMP-99.

There is a range of possibilities from which to choose for management of the fishery. One could select a point towards the upper left of the curve, which would provide formulae leading to high directed sardine TACs on average, but very little anchovy; conversely, a selection towards the lower right would mean high anchovy TACs on average, but little directed sardine catch. Fig. 1 shows the particular trade-off selection made in 1998 by the

Australian partnership approach' (1999) 56 *ICES Journal of Marine Science* 967; D S Butterworth 'Why a management procedure approach? Some positives and negatives' (2007) 64 *ICES Journal of Marine Science* 613.

⁵ J A A de Oliveira & D S Butterworth 'Developing and refining a joint management procedure for the multispecies South African pelagic fishery' (2004) 61 *ICES Journal of Marine Science* 1432.

management authority (without objection at the time from industry representatives) to provide TACs under OMP-99.

(a) 2001

Two important changes to the management of the small pelagics fishery were introduced in 2001. First, a process for reallocation of access rights for the following four years was undertaken. Secondly, increases in sardine abundance (see Fig. 2) necessitated a revision of the formulae for TAC recommendations, leading to a new (and more optimistic) trade-off curve for future annual TACs (OMP-02⁶) as illustrated in Fig. 1.

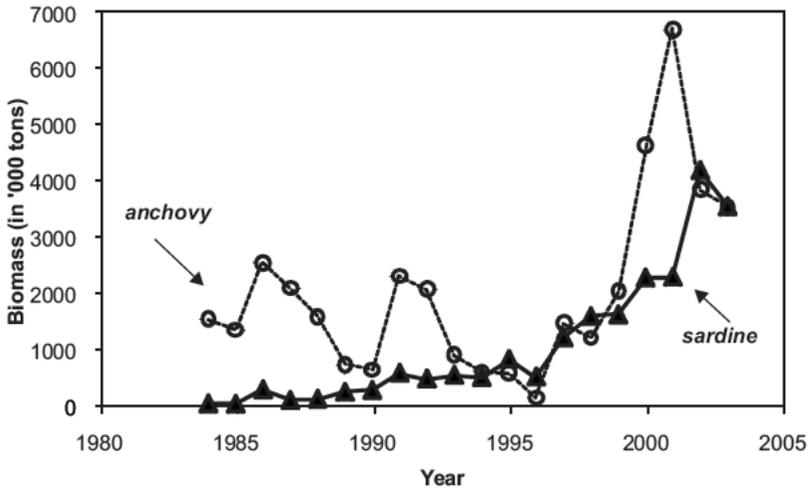


Figure 2. The time series of hydro-acoustic survey estimates of November sardine and anchovy biomasses from the inception of the surveys to November 2003.

It is important to appreciate that these trade-off curves show anticipated TACs *on average*. The actual annual TACs for the two species will fluctuate considerably and near independently, given marked variations in abundance from year to year (see Fig. 2). Fig. 3 provides an indication of the likely extent of this TAC variation.

⁶ Ibid.

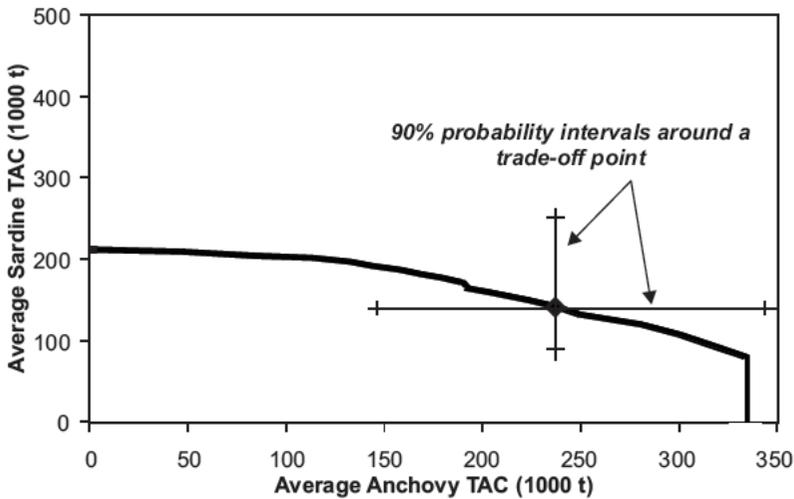


Figure 3. The OMP-02 trade-off curve, showing a possible trade-off point. The bars show 90 percentiles reflecting the extent to which the annual TACs set over time would be expected to vary about their average values.

Representatives of the industry were approached to provide advice on their preferred selection amongst the options along the OMP-02 trade-off curve. However, they were unable to offer a single and agreed view, commenting that because of past investment patterns, some companies would prefer greater anchovy catches, whereas others would prefer more sardine.

Previously, rights in the fishery had been allocated as percentages of TACs, so that if, say, the TAC for sardine increased, all holders of sardine rights benefited by the same proportion. Coupled to the trade-off selection, however, this raised a problem for the DEAT. Leave aside for the moment the fact that the re-allocation process might change a company's percentage share of one or other TAC. If a company held and retained a 5 per cent share of the sardine TAC, and a trade-off point towards the upper left of the OMP-02 curve in Fig. 3 was selected, that 5 per cent holding would translate into many more tons being allocated to them in quota than if a point on the lower right of the curve had been chosen instead. The DEAT opened itself to litigation whatever choice they might have made, as a selection towards the upper left would be seen as disadvantaging those companies preferring anchovy, and one towards the lower right discriminating against those preferring sardine.

A new approach was therefore implemented which allowed each company separately to choose its own preferred point on the trade-off curve. This was effected by letting each company specify its own preferred ratio (on average) of sardine to anchovy catch (corresponding to selecting its own preferred selection on the trade-off curve to best suit its needs), and awarding each a right as a percentage of the fishery as a whole. Each year a company would be allocated quotas calculated as if they were the only participant in

the fishery, with the associated TACs then scaled down by multiplying by their percentage share of the fishery as a whole. TACs for each resource followed by adding together the quotas allocated to each participant.

Broadly, the purpose of the scheme was that if one company changed its preferred ratio more towards sardine, say, it would receive higher sardine and lower anchovy quotas in terms of tons through a corresponding increase in the sardine and decrease in the anchovy TAC. Other companies maintaining their preferences would be unaffected by the change implemented by the first, as their quotas would remain unchanged in tonnage terms.

(b) *Implementation for 2002*

During 2001, a process was followed to convert sardine and anchovy quotas allocated to companies for 2001 into percentage shares of the fishery as a whole and the preferred species ratios (*rat1*) which could be inferred from these quotas. All those applying for rights for the 2002–2005 period (including potential ‘new entrants’ who did not have allocations for 2001) were required in their application forms to state their preferred species ratio (*rat2*) for that coming period.

By the end of 2001, the re-allocation process had led to revised awards of percentage shares in the fishery as a whole to all successful applicants.⁷ There was however concern that some such applicants might not have fully comprehended the implications of their specification of a preferred species ratio on their original application form, and the likely quota levels into which this would translate. A meeting of all successful applicants was thus held early in 2002 to explain this, and to allow each applicant a once-off opportunity to amend their preference.⁸ At that time these applicants were encouraged to modify their selections away from holdings that reflected exclusively (or near exclusively) one species only, towards mixtures of both species. This was to allow the applicants better capabilities to ride out periods when one of the species fluctuated appreciably downward in abundance, so that the associated quotas were substantially reduced. The resultant modified ratios are termed *rat3*.

Changes requested from *rat2* to *rat3* included some very large swings from anchovy towards sardine, moving the average trade-off point on the

⁷ A process allowing appeals to these allocations followed.

⁸ The reason that this explanation and opportunity for change did not take place earlier was that the DEAT was particularly conscious of not discriminating amongst applicants. Prior to allocations being finalised, the very large number of applicants meant that it was impractical to hold a meeting that all could attend to explain the implications of different preferred ratio selections. This was therefore delayed until the lesser number of successful applicants had been finalised. It is our view that that the SCA in *Foodcorp (Pty) Ltd v Deputy Director General, Department of Environmental Affairs and Tourism: Branch Marine and Coastal Management & others* [2005] 1 All SA 531 (SCA) para 16 appears to have misunderstood the nature and purpose of this exercise. This decision is discussed more fully from part IV of this article below.

OMP-02 curve (see Fig. 3) appreciably towards the left, and to an extent considered to be wasteful of the anchovy resource for little further gain in sardine catch. The DEAT therefore imposed a cap of fifteen percentage points on the extent to which any rights holder could increase their sardine/(sardine + anchovy) proportion in modifying from *rat2* to *rat3*. Ratios incorporating this cap are termed *rat4*. This capping process meant that Foodcorp was not allowed to increase their sardine:anchovy ratio to the full extent that they had requested.

III *FOODCORP (PTY) LTD v DEPUTY DIRECTOR GENERAL, DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM: BRANCH MARINE AND COASTAL MANAGEMENT & OTHERS (C, 2003)*⁹

Foodcorp sought an order in the Cape High Court to set aside the decisions of the Deputy Director General, DEAT, regarding the allocation of quotas for small pelagic species. Its motivation included two key contentions: that it had been inappropriately disadvantaged because its percentage share of the sardine TAC had decreased; and that the method used had failed to take due account of the difference in value between sardine and anchovy.

In dismissing the application, the court (Van Zyl J) commented (inter alia) that:

- ‘There is no merit whatever in the suggestion that the [DDG] did not apply his mind in making his decision or that his decision was arbitrary, unreasonable or procedurally unfair’;¹⁰ and
- ‘This is indeed one of those cases in which due judicial deference should be accorded to a policy-laden and polycentric administrative act that entails a degree of specialist knowledge and expertise that very few, if any, judges may be expected to have.’¹¹

In the case of *Hichange Investments (Pty) Ltd v Cape Products Company (Pty) Ltd t/a Pelts Products & others*¹² Leach J, in the Eastern Cape Division, made similar comments in an arguably similar situation relating to the causes and consequences of pollution. He stated that answering the questions raised in that case on matters of science required functionaries appointed by the legislature who were hopefully possessed of the necessary scientific background, and that ‘this Court would probably not be prepared to interfere by granting an order effectively usurping their powers and functions’.¹³

⁹ [2003] ZAWCHC 72 (12 December 2003).

¹⁰ Ibid para 66.

¹¹ Ibid para 68.

¹² 2004 (2) SA 393 (E).

¹³ Ibid at 412I.

IV *FOODCORP (PTY) LTD v DEPUTY DIRECTOR GENERAL, DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM: BRANCH MARINE AND COASTAL MANAGEMENT & OTHERS (SCA)*¹⁴

Foodcorp then brought aspects of their earlier application before the Supreme Court of Appeal. Inter alia the SCA judgment (per Harms JA, with Scott and Brand JJA, and Erasmus and Jafta AJJA concurring):

- laid emphasis on ‘glaring anomalies’ reflected by differing percentage increases in sardine quotas awarded to certain companies for 2002 compared to their allocations for 2001;¹⁵
- stated that ‘[o]ne does not need to understand the “complex processes, mathematical or otherwise”¹⁶ to realise that at least some of the results produced by the simple application of the formula [referring to OMP-02] were irrational and inexplicable and consequently unreasonable’;¹⁷
- also stated that ‘[m]isallocations in respect of three important commercial fishers must affect allocations in relation to all the other quota holders. On a recalculation they may get more or less of the TAC’;¹⁸
- implied that the Deputy Director General had failed to apply his mind adequately to whether the outputs of the OMP-02 formulae were reasonably justifiable.¹⁹

Consequently, the SCA set aside the order of the Cape High Court, and ordered ‘fresh determinations of the distribution of the pelagic TAC (and thus the individual rights allocation in the commercial small pelagics fishing industry) in respect of the 2005 season’.²⁰ In essence the SCA accepted Foodcorp’s original contention that it had been inappropriately disadvantaged because its percentage share of the sardine TAC had been decreased.

V MATHEMATICALLY FLAWED REASONING

That the SCA failed to understand the underlying basis for the allocation system linked to OMP-02 seems evident from their repeated reference to ‘the (pelagic) TAC’.²¹ Because of the trade-off between the sardine and the anchovy TACs (Fig. 1), and the opportunity allowed to all companies effectively to exchange between their sardine and anchovy allocations through specifying their preferred species ratios, the TACs themselves were not externally fixed, but instead depended on these selections. The hypo-

¹⁴ [2005] 1 All SA 531 (SCA).

¹⁵ Ibid paras 15, 17 and 18.

¹⁶ Quoting the court a quo (*Foodcorp (C)* supra note 9) para 68.

¹⁷ *Foodcorp (SCA)* supra note 14 para 18.

¹⁸ Ibid para 20.

¹⁹ Ibid para 19.

²⁰ Ibid para 21.

²¹ Ibid para 20, and the order of the court.

thetical example in Table 1 of a fishery with only two participating companies, with one (A) electing to change its preferred ratio but the other (B) not, illustrates this.

Table 1: A purely illustrative example of how a change in one company's (A) preferred ratio leaves another's (B) tonnage allocations unchanged, so that it is not disadvantaged even though its allocation of the sardine TAC expressed as a proportion (given in parentheses) decreases.

Pre-change

	Sardine	Anchovy	Ratio
Company A	60 (40%)	120 (60%)	1:2
Company B	90 (60%)	80 (40%)	9:8
TAC	150	200	

Post-change

	Sardine	Anchovy	Ratio
Company A	80 (47%)	80 (50%)	1:1
Company B	90 (53%)	80 (50%)	9:8
TAC	170	160	

Note that A's change in ratio towards sardine leads to an increase in the sardine TAC, with a compensatory decrease in the anchovy TAC. Importantly however, A's change of ratio does not affect B's allocation in terms of tonnage.

The example also shows that Foodcorp's argument that their reduced percentage share of the sardine TAC necessarily prejudices them does not follow. Although B above is not prejudiced by A's change of preferred ratio, B's percentage share of the sardine TAC has nevertheless dropped from 60 per cent to 53 per cent *because* A's change has led to an increase in the sardine TAC.

Similarly, the SCA's inference of large increases in percentage terms in a company's sardine allocation from 2001 to 2002 necessarily reflecting unreasonableness²² does not follow. The allocation system allowed — indeed, for sound strategic reasons, which have been explained in part II, *encouraged* — companies holding anchovy alone to 'swop' some of this for sardine (and vice versa), corresponding to infinite (but not therefore unreasonable) percentage increases in their sardine allocations. (Note that any increase from zero, however small, will always be infinite if expressed in percentage terms.) Hence for the issue at hand, percentage changes in quota allocations were simply not an appropriate metric upon which to base evaluations of the OMP-02 allocation approach.

The SCA used strong words to condemn the system of allocation underlying OMP-02, but these were based on reasoning that was mathematically flawed, as explained above. There was nothing irrational or inexplicable in the original allocations, which had been carefully considered, and made in terms of an

²² Ibid paras 15 and 17.

approach which had been endorsed by two independent reviews by leading world scientists in the field (on which see the discussion below).

VI FRESH DETERMINATIONS IN 2005

In motivating its fresh determinations for 2005, the DEAT drew attention (diplomatically) to the implications of the allocation system for comparisons in terms of percentages as explained in the preceding part of this article. It further pointed out that the adoption of OMP-02 had involved an important strategic decision concerning use of the sardine resource. Earlier OMPs had capped the maximum sardine TAC at amounts that would satisfy the maximum market capacity for canned product. However, the increase in sardine abundance across the turn of the century (see Fig. 2) meant that continuation of this strategy would waste the resource, as further sardine that could be used for fishmeal (for which South Africa's requirements at the time necessitated imports) would remain unutilised. Thus 'swops' of anchovy for sardine were to a large extent confined to fishmeal rather than increasing can-able product, with much lower value per ton differentials for the former.

By that time, a further appreciable increase in sardine abundance (see Fig. 2) had resulted in replacement of OMP-02 with OMP-04.²³ Fig. 4 shows how the OMP-04 trade-off selection was made — essentially in a way that maintained each rights holder's percentage shares of the sardine and the anchovy TACs.

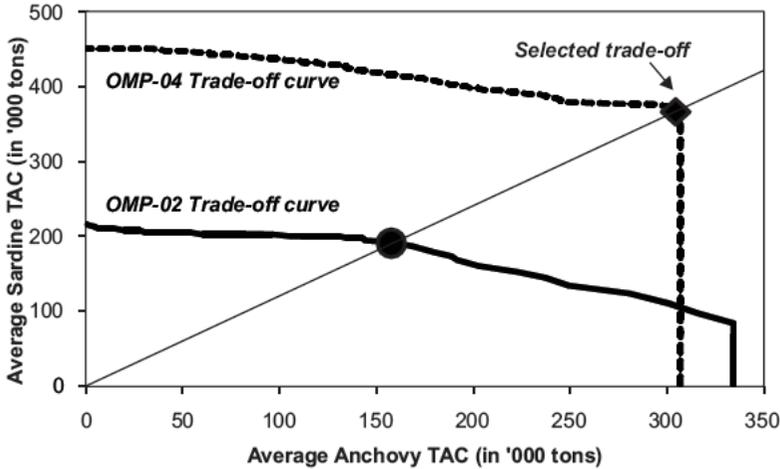


Figure 4. The OMP-02 and OMP-04 trade-off curves. The straight line shows how the trade-off selection for OMP-02 was used to make this selection for OMP-04.

²³ C L de Moor, D S Butterworth & J A A de Oliveira 'Is the management procedure approach equipped to handle short-lived pelagic species with their boom and bust dynamics? The case of the South African fishery for sardine and anchovy' (2011) 68 *ICES Journal of Marine Science* 2075.

This biological re-evaluation also allowed reconsideration of the cap imposed on changes in preferred ratios in 2002 (i.e. the use of *rat4* rather than the requested *rat3* — see above). In the fresh determinations, this cap was removed, so that all companies, including Foodcorp, were given allocations exactly in terms of their requested preferred ratios (*rat3*). This resulted in a small increase in Foodcorp's percentage share of the sardine TAC.

VII *FOODCORP (PTY) LTD v DEPUTY DIRECTOR GENERAL, DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM: BRANCH MARINE AND COASTAL MANAGEMENT & OTHERS (C, 2005)*²⁴

Foodcorp applied to the Cape High Court to set aside the DEAT's fresh determination of the 2005 TAC allocation, contending that it was unreasonable and irrational. Instead, it sought reductions to the sardine quotas awarded to some other companies to increase its own tonnage and percentage share of the sardine TAC.

In responding papers it was pointed out that under OMP-04, the reductions in sardine allocations (and consequent increases in anchovy allocations) to those other companies that were sought by Foodcorp would see the sardine TAC reduced in such a way that although Foodcorp's sardine allocation would increase in percentage terms, it would remain virtually unchanged in terms of tons.

In ruling for Foodcorp, and referring the matter back to the DEAT for urgent fresh determination of allocations, the court (Davis J), *inter alia*:

- again focused on percentage-of-TAC based arguments; no response was offered to written evidence provided of their mathematical inappropriateness;
- stated that '[h]aving a lower percentage than that which was allocated at the time of the 2001 [sardine] TAC, will result in [Foodcorp] suffering prejudice';²⁵
- also stated that the DEAT's fresh determinations hardly differed from previous ones, and consequently 'appear to be no less irrational, inexplicable and unreasonable than those which were considered by the SCA'.²⁶

Thus, in essence, Davis J seems to have based his decisions on the same flawed mathematical reasoning as had the SCA.

VIII SETTLEMENT

Leave to appeal this Cape High Court ruling before the SCA was granted, but in the meantime out-of-court settlement discussions were initiated. These resulted in agreement to fix the 2005 allocations using OMP-04, but with preferred ratios (in the form of sardine/[sardine + anchovy] propor-

²⁴ 2006 (2) SA 199 (C).

²⁵ *Ibid* at 209D–E.

²⁶ *Ibid* at 209H–I.

tions) limited to change by no more than 25 percentage points towards sardine from the values (*rat 1*) that were inferred to have applied implicitly in 2001.

This resulted in little change to the TACs for 2005. However, Foodcorp's allocation of the revised sardine TAC increased somewhat in percentage terms, while their anchovy allocation reflected a corresponding decrease. For some other large companies, the effect was the reverse.

IX FUNDAMENTAL SCIENTIFIC CONCERNS

The processes related above and some of their outcomes raise certain more fundamental concerns from a purely scientific perspective.

Both the SCA and the subsequent Cape High Court decisions effectively overruled scientific analyses that had been subjected to two separate international peer reviews. First, the OMP-02 related approach had been considered by an international stock assessment workshop held in Cape Town in November 2001,²⁷ with the recommendations of a high level invited international panel being incorporated in the version of OMP-02 ultimately implemented the following year. Attendance of this workshop was open to members of the small pelagics fishing industry, some of whom took this opportunity. Furthermore, the analyses had been separately reviewed by an international panel of examiners when submitted as a University of Cape Town PhD thesis by José de Oliveira.²⁸

This does not intend to suggest, of course, that the analyses (and their reviewers) were necessarily fool-proof and infallible, nor that they should have been accepted without question by the courts. However, what is of concern is that the primary basis which both courts in this matter seem to have used to term the scientific analyses irrational, and hence to overrule them, was mathematically flawed, and seems to suggest that the basis of the overall approach used was not understood.

While the litigation played itself out, desirable interactive discussions between scientists and industry on the allocation issue and its possible links to future OMP development had to be suspended for a lengthy period of some three years.

This is not the only recent fisheries case in which the Cape High Court has effectively ruled on scientific issues in a questionable manner. In the matter of *West Coast Rock Lobster Association & others v The Minister of Environmental Affairs and Tourism & others*,²⁹ the court (Davis J) showed commendable concern³⁰ that the first respondent had granted interim measures (effectively

²⁷ Report of the BENEFIT Stock Assessment Workshop, University of Cape Town, 18–24 November 2001 (BENEFIT Programme).

²⁸ J A A de Oliveira *The Development and Implementation of a Joint Management Procedure for the South African Pilchard and Anchovy Resources* (PhD thesis, University of Cape Town, 2003).

²⁹ [2008] ZAWCHC 123 (7 October 2008).

³⁰ *Ibid* para 50.

allocations beyond the scientifically recommended TAC) that might place excessive pressure on the resource concerned. Nevertheless, the court went on to conclude,³¹ effectively on the grounds that fisheries is an inexact science and hence that projections are subject to error, that the first respondent's decision was not unjustified.

Was the court fully aware of the serious (and arguably dubious) precedent created by this interpretation? The South African Marine Living Resources Act requires the Minister, in exercising power under the Act, to have regard inter alia to 'the need to apply precautionary approaches in respect of the management and development of marine living resources'.³² While there is certainly debate in scientific circles about the extent of precaution that should be shown in decisions, there is nevertheless no disagreement that the intent of the Precautionary Principle,³³ to which the Act intends to give effect, is that the greater the degree of scientific uncertainty, the larger the reduction that should be made of, say, a TAC below the value following from a deterministic calculation which ignores such uncertainty. Certainly the adoption of the Precautionary Principle sought to avoid repetitions of past problems in environmental management as a result of uncertainty being argued as a reason to postpone more restrictive decisions. The court's interpretation in this case ran completely contrary to this intent. Uncertainty had already been factored into the TAC calculation concerned. Thus the only basis on which the court could have ruled as it did, while remaining consistent with the provisions of the Act, was by demonstrating that the extent of uncertainty for which allowance had been made was unreasonably large.³⁴

X A WAY FORWARD?

The point at issue here does not concern court judgments regarding administrative decisions, even when these include scientific elements, when these are based solely on due process considerations. Rather, it relates to the situation when such judgments extend, perhaps unwittingly, to decisions on the merits of scientific arguments.

Viewed from the perspective of scientists, the judgments discussed above, which appear to us to have been flawed as a result of errors of understanding of the underlying science, must be a concern. Perhaps naively, given our

³¹ Ibid para 51.

³² Section 2(c).

³³ Report of the United Nations Conference on Environment and Development (Rio de Janeiro, 3–14 June 1992), Annex I, Rio Declaration on Environment and Development, Principle 15.

³⁴ We note that the matter was subject of an appeal to the Supreme Court of Appeal: see *West Coast Rock Lobster Association & others v Minister of Environmental Affairs and Tourism & others* [2011] 1 All SA 487 (SCA). The appeal was argued on grounds narrower than in the original application and was disposed of by that court largely on procedural grounds. As a result the SCA did not deal with the substance of the allocations issue.

background, we suggest below how these concerns might be addressed to avoid repetition of such argued errors. We do so with the intent of promoting debate on an issue that may well be of wider relevance than the specific field to which the examples given above belong.

In scientific circles, relatively complex analyses of the nature of those above typically require an iterative mode of presentation and discussion for their clarification, but we doubt that typical administrative law court proceedings in South Africa could afford the time for this.

We thus put forward the suggestion of the appointment of one or more scientific or technical experts as assessors to assist the judge when such issues arise, for which we understand that there is at present no formal allowance in the pertinent South African Law. This is not without precedent in marine litigation procedures. For example, the world's primary international legal instrument governing marine matters, the United Nations Convention on the Law of the Sea (UNCLOS), makes specific allowance for this in its procedures for the resolution of disputes by the International Court of Justice, the International Tribunal for the Law of the Sea, or a specific arbitral tribunal appointed to address the issue concerned.³⁵

In the USA, Rule 706 of the Federal Rules of Evidence³⁶ grants judges the authority to appoint such an expert. Thus, for example, Justice Kessler of the US District Court, District of Columbia, appointed Dr W M Getz of the University of California at Berkeley as the court's technical advisor in a fisheries case 'to explain highly technical and scientific issues related to the imposition of a remedy'.³⁷

We are not suggesting that fisheries-related issues alone be singled out for such a process, for which there would anyway seem to be a case for more general application. Nevertheless, we would assert that the relatively high potential for litigation to eventuate over fisheries management decisions does

³⁵ UNCLOS, art 289, which reads: 'Experts: In any dispute involving scientific or technical matters, a court or tribunal exercising jurisdiction under this section may, at the request of a party or proprio motu, select in consultation with the parties no fewer than two scientific or technical experts chosen preferably from the relevant list prepared in accordance with Annex VIII, article 2, to sit with the court or tribunal but without the right to vote.'

³⁶ Fed R Evid 706. 'Court Appointed Experts. (a) Appointment. The court may on its own motion or on the motion of any party enter an order to show cause why expert witnesses should not be appointed, and may request the parties to submit nominations. The court may appoint any expert witnesses agreed upon by the parties, and may appoint expert witnesses of its own selection. An expert witness shall not be appointed by the court unless the witness consents to act. A witness so appointed shall be informed of the witness' duties by the court in writing, a copy of which shall be filed with the clerk, or at a conference in which the parties shall have opportunity to participate. A witness so appointed shall advise the parties of the witness' findings, if any; the witness' deposition may be taken by any party; and the witness may be called to testify by the court or any party. The witness shall be subject to cross-examination by each party, including a party calling the witness.'

³⁷ *Conservation Law Foundation v Evans* 203 F Supp 2d 27 (DDC 2002).

argue for more attention to be given to addressing procedural issues in this area than more standard metrics such as the (relatively low) economic importance of fishing to the South African economy might otherwise suggest. This potential arises from the multi-faceted nature of fisheries, coupled with the inexact nature of the associated science. Many stakeholders groups are involved, often with near-diametrically opposing interests, such as the fishing industry and Environmental Non-Governmental Organisations (ENGOS), leading to a wide scope for differing views and consequent conflicts.

In the USA, for example, the active case load of the National Marine Fisheries Service in the early years of this century exceeded 100 matters, consuming a considerable portion of the Agency's resources. This had grown by an order of magnitude since the mid-1990s, primarily as a result of three factors: expanded legislation, the growing involvement of ENGOS, and earlier over-capitalisation of US fisheries.³⁸ The last was related to the 'Americanisation' of these fisheries, as foreigners were excluded over time following the imposition of 200 nautical mile exclusive economic zones in the mid-1970s under UNCLOS. It led to overharvesting and consequent disputes under the sustainability criteria of the US Magnuson-Stevens Act³⁹ and related legislation. Although greater care taken by the Agency in terms of following process requirements has more recently improved their record of success in such litigation, and reduced their active case load, this still totals close to 100.

Could South Africa find itself repeating this US experience? Some factors mitigate against this possibility: broadly speaking, South Africa has fewer and less complex Acts, and the Marine Living Resources Act does not attempt the degree of technical prescription concerning sustainability requirements to be found in the US Magnuson-Stevens Act. On the other hand, though, recently there has been a growing presence and level of activity in marine matters of international ENGOS in South Africa, and the process of post-apartheid redistribution of fishing rights to better favour the previously disadvantaged, including subsistence users (which has already led to a number of cases before the courts), is not yet at an end. With most South African fisheries fully or over-exploited, sustainability considerations will likely come under pressure as decision makers struggle to meet the competing demands of these different user groups.⁴⁰

³⁸ *Courts, Congress and Constituencies: Managing Fisheries by Default. A Report by a Panel of the National Academy of Public Administration for the Congress and the U.S. Department of Commerce National Marine Fisheries Service* (July 2002).

³⁹ Magnuson-Stevens Fishery Conservation and Management Act, 16 USC § 1801 et seq, as amended by the Sustainable Fisheries Act of 1996, US Pub L No 104-297, 110 Stat 3559 (1996) and The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, US Pub L No 109-479, 120 Stat 3575 (2007).

⁴⁰ A topical example is the furore that developed in the Cape Town press late in 2010 when Government heavily reduced the season length for recreational rock

What is evident from the array of fisheries-related cases considered in the US is the great number in which scientific and technical issues play an important role,⁴¹ which argues for the importance of refining legal procedures in South Africa to be well structured to deal efficiently and effectively with these.⁴²

XI POSTSCRIPT

Because of the unpredictability of natural resource fluctuations, there is an unavoidable element of (hopefully intelligent) gambling in the manner in which fishing companies plan for the future. In their actions in the matter discussed above, many companies were certainly influenced, probably to a large degree, by the dramatic increase in the sardine resource that occurred at the turn of the century (see Fig. 2). In their efforts to trade anchovy for sardine, they were gambling that this higher sardine abundance would continue for a reasonable period.

Somewhat ironically, given the litigation and other actions pursued by some companies to give effect to heavier gambles on this possibility, the outcome proved unfavourable to them. Fig. 5 (which appears on the next page) extends Fig. 2 to show survey estimates for sardine and anchovy biomasses since the time of this litigation. While the anchovy resource has remained buoyant, the sardine suffered a period of seven years of below average recruitment subsequent to the peak around the turn of the century. Consequently, while anchovy TACs have remained high, sardine TACs have had to be substantially reduced, and from 2009 to 2011 have been set at the minimum of 90 000 tons considered necessary (subject to the population not declining yet further) to maintain canning operations without some companies being forced into liquidation.

lobster fisheries to be able to continue to accommodate 'interim relief' allocations to subsistence fisheries, while attempting to remain within sustainability limitation. For example, see J Yeld 'Caught between a rock and a hard place — the Government battles to allocate kreef quotas that will not further harm dwindling numbers' *Cape Argus*, 1 December 2010.

⁴¹ Op cit note 38.

⁴² Shaheen Moolla (FEIKE Natural Resource Management Advisors) has recently brought s 19bis of the Supreme Court Act 59 of 1959 to the authors' attention. This allows, subject to the consent of the parties, for the appointment in civil proceedings by any court of a provincial or local division of a referee to carry out scientific investigations which the court considers that it cannot itself conveniently conduct. See for example *Distinct Investments (Pty) Ltd v Arhay CC; Bloom v Das Neves & another* [1997] 2 All SA 513 (W), where this section was employed (albeit in a commercial matter where an expert auditor's assistance was required). It may be that this provides a mechanism for the approach we seek. If that is indeed the case, we would suggest that South African courts should make readier use of this mechanism in situations such as those on which we comment above.

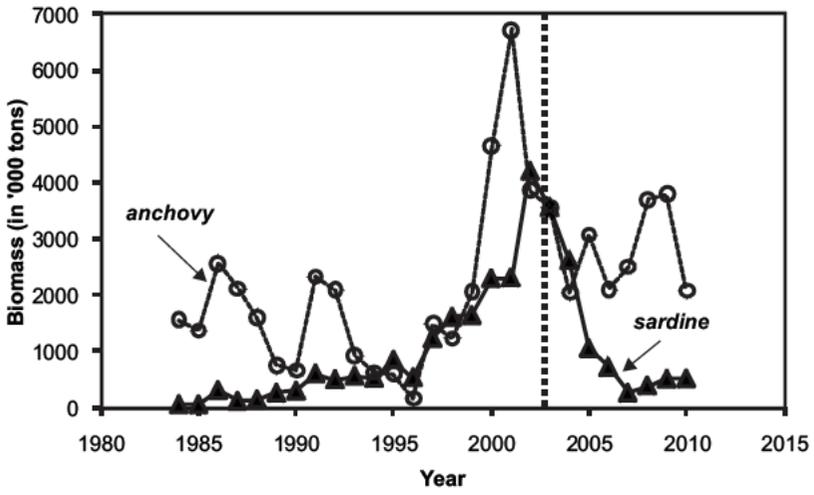


Figure 5. An extension of Figure 2, now showing November sardine and anchovy biomass estimates since the height of the litigation to 2010.