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Problems of Controlling Fishing Effort, with especial reference to the Northwest Atlantic

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I PROBLEMS OF CONTROLLING FISHING EFFORT, WITH ESPECIAL REFERENCE TO THE NORTHWEST ATLANTIC[3]

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(i) Introduction

1. This paper was originally prepared for discussion at the Mid-Year Meeting of the Standing Committee on Regulatory Measures of ICNAF (International Commission for North Atlantic Fisheries). It is reproduced here in the belief that many of the principles discussed are of fairly general application and will be of interest to those concerned with the management of fisheries in areas other than those of the Northwest Atlantic.

2. The biological aspects have been well described by previous documents submitted to ICNAF (the Templeman-Gulland report, 1/ the 1966 memorandum by the UK Commissioners, 2/ etc.). These have pointed out that while control of the sizes of the fish caught, by mesh regulation or otherwise, will continue to give some benefit to the fisheries in the Convention area, control of the amount of fishing (strictly the fishing mortality coefficient) is necessary to obtain the full potential benefits of rational management. These benefits may occur both in the form of reduced costs and as an increased gross catch.

3. Since part, and often the major part, of the potential benefit of reducing the fishing mortality lies in the possibility of reducing the costs of fishing, the effectiveness of a regulation must be considered in two parts - does it ensure that the desired level of fishing mortality is achieved; and does it allow this mortality to be caused at the least possible cost?

4. So far as the present paper is concerned, the first part will be considered as dealt with by previous deliberations of ICNAF. These concluded that in such a complex international fishery the primary control would be a total catch quota, set to achieve the desired fishing mortality, with shares allocated to member countries. This allows each country to arrange its national regulations in accordance with its particular problems and objectives, provided the national catch quota is not exceeded. The present paper will be concerned with examining some of the possible national arrangements whereby the national quota can be achieved.

(ii) Methods of controlling fishing

5. However the national catch quota is determined, it is almost certain that for a short period immediately following regulation the quota will be less than the catch that could be caught by the national fishermen if they were not restricted. It may be noted here that some of the major problems in the limitation of fishing effort arise from the need to reduce the amount of fishing from an excessive level. These problems might be eliminated or reduced if some control had been introduced earlier to prevent such an over-expansion. Consideration should therefore be given to the development of a suitable administrative framework which, while not interfering with the expansion of fishing on an under-exploited stock, will allow this expansion to be slowed down or stopped as the optimum level of fishing mortality is approached. The relatively smooth operation of the scheme regulating the South African west coast shoal fisheries during the early nineteen-sixties would seem to bear out this point.

1/ Templeman, W. and J. Gulland. Review of possible conservation actions for the ICNAF 1968 Area. Anu. Proc. int. Comm. Northw. Atlant. Fish., 17:48-84

2/ UK Commissioners. Note by the United Kingdom Commissioners on the Regulation of 1966 fishing effort. ICNAF Comm. Doc. 66/17

3/ Distributed February 1970 as FAO Fisheries Circular No.119

6. If the capacity of the fishery fleet is such that the effective amount of fishing is too large, fishing mortality can be reduced in four ways:

(i) allowing free fishing up to the time at which it is believed that the national catch quota has been reached

(ii) issue a limited number of licences, e.g. for the operation of a limited number of vessels, or for the capture of a limited quantity of fish

(iii) allow all to fish all the time (or most of the time) but limit the efficiency of operations. This method clearly prevents any reduction in the costs of fishing and thus loses much of the possible benefit of regulations. However, in one form or another (prohibitions on trawling, on the use of monofilament gill nets, limitation on the size of ship) such methods have been widely used, especially in national programmes of fishery management, but will not be considered further here

(iv) some combination of (i) and (ii)

7. Certain specific measures may not clearly fall into these categories. For instance, a closed season might be considered either as a special case of (i) or (iii). That is, timing and duration of the closed season might be chosen mainly to reduce, in effect, the efficiency of fishing. The duration of the open season may also be determined, near the beginning of each year, on the basis of the estimated capacity of the fleet; this may be considered an extreme case of the problem noted below (paragraphs 13 to 16) in fixing the closing date under a quota system.

(iii) National quota regulation

(a) General

8. This method has some clear advantages. It is non-discriminating - or at least if there is discrimination, e.g. giving some advantage to those who can get the bigger share of the quota while the season lasts, the regulatory body is not explicitly involved in making a discrimination, i.e. between those who can fish and those who cannot, or in determining the share of those who can.

9. However, there are great economic disadvantages in an undivided national quota system in that there is, in its simplest form, no control of the size or fishing capacity of the fleet. (Fishing capacity may be defined, in the sense used here, as the fishing mortality that could be exerted by a fleet of vessels if it operates without restriction.) If the regulations achieved their objective in increasing the stock and the catch rates, and so make fishing more profitable, additional ships will be attracted into the fishery. The enlarged fleet will reach the desired catch quota more and more quickly, so that the open season becomes shorter and shorter. This effect, readily predictable in theory, has been observed in most fisheries where an undivided quota system of regulations has been used.

10. The long-term result will be that costs will rise with the shortening season until a new equilibrium position is reached, as before regulation, in which the costs of fishing are equal to the value of the catch, and the potential economic benefits of the regulation are lost. The increased costs will include increased catching costs, since the vessels may only be usefully occupied for a short time, and probably also increased costs after landing; for instance a large storage capacity may be required. Another element of costs which should be considered is the cost of administrating and enforcing the regulations.

11. This type of regulation can also affect the value of the catch. If much of the fish is marketed fresh a short season may cause a big drop in the average price. Therefore, if the economic benefits are to be obtained some form of entry limitation is required, either alone or in combination with a national quota system.

12. In addition to the dissipation of economic benefits through increased costs there are also practical and technical problems in putting a national quota scheme into operation. The first of these concerns the determination of the date after which fishing for the regulated species will not be permitted.

(b) Setting the closing date

13. To determine this accurately requires a good reporting system - monthly, weekly or daily - so that the regulatory authority can tell when the quota level is approached. An example of a simple system was that of the International Whaling Commission for baleen whaling in the Antarctic, which received weekly and, as the end of the season approached, daily reports of catches and closed the season when it was estimated that the quota would be reached. All catches of baleen whales then stopped. Enforcement was easy and relatively cheap, since there were two inspectors on each factory ship, who were also concerned with other regulations, e.g. size limits.

14. In other fisheries the determination of the closing date is more difficult. It may well be hard, without very good policing at sea, to enforce a closing date in terms of catching fish, that is, if a closing date is set as in the IWC there will be ships at sea with their holds half full of legally caught fish. If they later return to port, perhaps after nominally fishing for some unregulated species, it would be impossible to determine whether any fish had been caught illegally. One check would be from regular reports from each ship, so that only the quantity reported by the date of closure would be legally landed; however, this clearly gives a great incentive to mis-reporting.

15. For this reason IATTC in its regulation of the yellowfin tuna has based its closure on the sailing date. Any ship sailing before a certain date can continue fishing until her holds are full, and she returns to port. Vessels sailing after the closing date are not permitted to fish for yellowfin.

16. This system puts a much greater demand on the Commission's skills in fixing the closing date. Three elements should make up the quota - the fish already landed, those likely to be landed by ships at sea on the closing date, and fish caught incidentally after the closing date by ships fishing for other species. Only the first of these is known at the time the closing date is fixed.

(c) Enforcement

17. The foregoing considerations raise the question of enforcement. During the open season the only action required is the reporting of statistical data. An individual will have little incentive to mis-report his catch since any adjustments will make little difference to the total and hence to the closing date. Normal care will be needed for conversion of fish processed in various ways (gutted, filleted and frozen, salted etc.) to a standard form (round fresh weight), and for establishing the area of capture, but no special enforcement problems are likely.

18. If the closed season applies to all stocks of a particular species, or fish from the regulated stocks can be identified to the satisfaction of a court of law at the time of landing, then the chief enforcement problem concerns the date of capture. The magnitude of the problem depends, as noted above (paragraph 13) on the definition of the closed season. If all fishing for the regulated species is free up to a certain date and is then prohibited, enforcement at sea seems essential unless the vessels in the fishery make very short trips, e.g. inshore vessels landing daily. Other methods, allowing vessels already at sea to continue fishing, need control only at the point of landing.

19. If some stocks of the same species remain uncontrolled during the closed season, enforcement will depend either on control at sea or on being able to establish the origin of the fish when landed. In the Pacific tuna fishery demands have been made, unsuccessfully as yet, to pass the burden of this on to the fishermen, by requiring those purse-seiners wishing to catch yellowfin tuna outside the IATTC regulatory area during the closed season to carry, at their expense, an independent navigator to observe their position and to certify that fishing is indeed done outside the regulatory area.

(iv) Licensing or the allocation of shares

20. The application of the second method of control outlined in paragraph 6, allowing free fishing by some fishermen but preventing others from fishing the regulated stock at all, requires two separate although not entirely independent decisions. A decision has to be made concerning firstly the measure in which the licence is expressed, and secondly which fishermen are to be excluded from fishing the regulated stock.

(a) The unit of measurement

21. In some ways the most natural unit for licensing is the vessel. A licence could then take the form of the right to exploit the regulated fishery with one particular vessel or one vessel unspecified, or one vessel of a particular type specified in greater or smaller detail, e.g. a 200 ton trawler, with an engine of not more than 500 hp.

22. The justification of using the vessel rather than catch as a basis for licensing is that the vessel is the natural basic operating unit. Also control is easier - a limited number of licensed vessels can fish, and unlicensed ones cannot. These practical advantages of vessel licences, rather than a licence to catch a certain quantity, are particularly marked when the fishing industry is composed of a large number of separate units, especially skipper-owners, rather than a few big concerns. A large concern operating a number of ships can adjust the number to its catch quota, making adjustments if necessary towards the end of the season; most of the active ships can then work at full capacity throughout the year. A man operating one ship has less flexibility - there is a certain quantity of fish he can catch (or a certain fishing mortality he can cause) if the ship fishes at full capacity - a bigger catch quota cannot be used, and a smaller quota means that the ship is working at less than full efficiency, unless good alternative employment is available. This aspect is not confined to small operations; one of the problems facing the Norwegians in Antarctic whaling as the quota was reduced was that in some seasons their share, based on a fixed percentage of the total, was too large to be harvested by a single expedition (factory ship plus associated catchers, supply ship etc.), and too small to support two expeditions.

23. Licensing in terms of the vessel does raise major problems of ensuring that the quota is not exceeded. Previous reports to ICNAF have noted the difficulties of using a standard measure of effort to estimate fishing mortality, due to the tendency of the fishing power of the individual vessel to increase from year to year. This tendency will be increased under a simple vessel licence scheme. For example, if a fisherman has a licence to operate one trawler he will then build the biggest one feasible, even if this is not necessarily the best one from other viewpoints for the fishery. This might be controlled by limiting the size to so many gross tons; then a bigger engine would be fitted. In turn the nominal horsepower might be controlled, but the engine ran flat out (the extra catch making up for increased maintenance and replacement costs). Though the framer of the regulations may catch up with the ingenuity of the fisherman, it is more likely that the latter will keep one jump ahead. In any case the vessel and gear and the methods of operations will be designed more to maximise the catch within

the limits of nominal effort set by the regulations, than to maximise the catch from a given total of costs or to minimise the costs of taking a certain catch. To this extent the fishery will operate at less than its possible efficiency, and the magnitude of this inefficiency is likely to continually increase.

24. There seems, in fact, no easy answer to the problem of maintaining the true fishing mortality at the desired (economic) level through control of nominal fishing effort. The more obvious changes in fishing power, e.g. by the building of larger vessels, can be easily observed and either prohibited, or better, taken into account in determining the total number of licences. Some of the biggest improvements, however, are not so easily observed; for example, the German technique of mid-water trawling for post-spawning cod at West Greenland greatly increased the catches per vessel. Clearly it would be both undesirable to prevent this development and difficult to enforce such a prohibition if desired, but if the amount of fishing were controlled in terms of number or size of vessels, the new technique would mean that the desired mortality (and national catch quota) would be greatly exceeded. Thus the licence scheme which best assures that no more and no less than the national quota is achieved is one in which the licences are expressed as proportions of the national quota.

(b) <u>The allocation of licences</u>

25. The other major problem in licensing concerns the allocation of licences. Whatever unit the licence is measured in its possession is the title to receive a share in the potential economic benefits generated by the regulation. These benefits may be compared to a series of income flows which will increase until fishing mortality is reduced to its optimum economic point and the fish stock increased to its new equilibrium level. Thereafter, subject to annual fluctuations due to natural factors such as variations in year-class etc. the benefits will remain constant. In theory, if the licensing authority wishes to appropriate all the potential benefits of the scheme then the total annual value of the licence fees should be equal to the annual surplus generated. Effort can, therefore, in theory be reduced in this manner, the fees charged in each year easing out the marginal units of fishing effort.

26. Because of the economic distress now common in many North Atlantic fisheries it seems that the share of the total potential benefit accruing to the industry should be fairly large, especially in the initial period. In this manner it may be possible for governments to reduce and finally to eliminate the subsidies which, in some form or other, are a common feature in the fisheries of many North Atlantic countries.

27. In practice, the introduction of a scheme for the allocation of a national catch quota offers to governments a number of possibilities. The problem is, however, administratively more difficult when the regulation is of a stock which is already depleted. This arises from the fact that the global quota in the first year of the scheme's operation will inevitably be less than the catch in the year before the regulation is introduced. It is, as already mentioned, administratively much easier to prevent the entry of excessive effort than to reduce effort which is already being exerted.

28. Most of the schemes for the limitation of fishing effort which are presently in existence have, however, issued licences to all fishermen (or vessels) currently operating at the time of the scheme's introduction, and for political reasons it seems difficult to initiate a scheme on any other basis. These licences could be, in effect, permits to operate existing vessels (vessel licences), or to take a certain proportion of the national quota, presumably based on past performance (catch licences). The scheme which seems to present the least immediate administrative problem is to issue vessel licences. However, since this would imply no immediate reduction in fishing capacity, some additional regulatory measure would be necessary to ensure that the national catch quota is not exceeded. While this procedure makes regulation more complex, with two separate processes - issuing vessel licences to control the fishing capacity and setting a catch quota to control fishing mortality - this may not be too inconvenient.

29. It is clear, however, that if in the first instance the licences are issued to all persons in the industry, and if the fleet is to be run down by attrition, the licences cannot be made transferable until the optimum fleet capacity has been attained, otherwise there would be no decrease in capacity. Retiring fishermen or vessel owners would merely sell their licences to other fishermen or even to new entrants, and fishing would thus be maintained at the same intensity.

30. Such a system also offers no incentive to withdraw until the point at which licences become transferable and convertible into cash. If the reduction in fishing capacity is left to a process of attrition (i.e. death and the natural wastage of vessels through loss, etc.) the required reduction in fishing capacity could take decades to achieve. At the same time the process of attrition, not accompanied by some forms of compensation, will give rise to injustices and loss to those forced by old age, illness, etc. to drop out of the industry, before free transfer of licences is permitted. Thus it seems almost certain that governments will be obliged to re-purchase the licences, and this can be done in a way designed to bring about the desired rate of contraction in catching capacity. The extent of such a scheme, and the priority given to it will depend on the extent of the reduction in capacity that is required. A re-purchase scheme is probably less important in ICNAF fisheries, where a reduction in mortality and in capacity of 10-30 percent is being discussed, than in, for example, the Pacific salmon fisheries where a reduction of perhaps 90 percent would be necessary to allow the remaining units to fish at full efficiency. Once fishing capacity has been reduced to the optimum level the major problem then becomes the administration of the scheme in a manner which is both fair and which at the same time does not ossify the structure of the industry.

31. One of the major problems concerns the transferability of licences and the related question of new vessel construction, as well as of improvements to existing vessels and gear. Clearly a licence attaching to an old and relatively inefficient vessel cannot be directly transferred to a new, more powerful vessel. Under a scheme of vessel licensing the transferability of licences requires, therefore, the solution of problems associated with the inter-calibration of vessels of different characteristics and using different gears.

32. Many of the difficulties incurred in the rationalisation of a fishery with excess fishing capacity may be avoided if the licences are expressed in terms of catch. This should enable the licence holder to choose the most efficient vessel and gear and to operate it in the most effective manner. Also, provided licences are transferable, their expression in terms of catch will encourage the development of the most efficient units. For example, if a fisherman acquires catch licences which had been used to operate two old and inefficient vessels, he can immediately use these licences for the operation of a new vessel without the technical and other problems involved in exchanging vessel licences described in the preceding paragraph. Such a system also eases the problems of new entrants, since the licences would be transferable from the outset and purchasable in the open market.

33. The duration of licences requires consideration. In the simplest situation these may be permanent, but governments may consider it desirable for a definite term to be set for a licence. This minimum duration should be a fair proportion of the economic working life of a vessel, otherwise rational planning of new construction would be difficult. The period might be 10-20 years, with five or ten percent of the licences being renewed each year.

34. If licences are valid only for a period, then once the stocks have been rebuilt under management, fishing should be highly profitable, and there should be a large number of applications for new licences - very much more than the number of available licences. One way to reduce the number of applications to approximate equality with the number available is to charge a sufficiently high licence fee. If vessel licences are used and a number of different types and sizes of vessel are concerned, then the fee

should vary with the characteristics of the vessel. The pattern of this variation will, if licences are large, have a considerable influence on the way in which the fishery develops. For example, if fees increase only slowly with the vessel size, there will be an incentive to build larger and larger vessels. If the objective is to harvest the national quota at least cost, it is probable that the licence fee should be in proportion to the total costs of the vessel. Though it may be difficult to measure these precisely, a fair estimate can be fairly rapidly obtained and used as a guide to the pattern of licence fees.

(c) Enforcement

35. Some of the problems of enforcement already mentioned in connection with an undivided national quota are applicable also to the enforcement of regulation by licensing. These include the problem of identification of the regulated species, as well as the need for the conversion of fish processed in various ways to a standard form. Licensing as a form of regulation, however, raises some special problems of its own.

36. The details of enforcement of regulations for ships with licences depends on whether licences are in terms of volume of catch or of the vessel. For the latter it is a matter then for the specification, e.g. gross tonnage, carrying capacity, etc., to correspond with the terms of the licence. This can be done in port, and need not be done frequently and therefore should be both cheap and relatively easy.

37. Enforcement of a catch licence is less easy. Unlike the checking of the catch under a national quota system, there is considerable incentive to under-report catches. This will require continued inspection at the landing places, and for factory ships and others landing processed fish, clear definitions of conversion factor from say skinless fillets to the standard form (round fresh weight).

38. Enforcement of the regulations for vessel without a licence raises exactly the same problems as the enforcement of the closed season under a national quota system, and requires no special discussion.

(v) Diversion of effort to other species

39. A likely effect of the limitation of fishing effort on a given stock, whether by national quota or by licensing, is the diversion to another stock. The effects are not always predictable and may not necessarily be beneficial. The most critical factor is the degree of exploitation of the alternative stock. If this is also heavily fished the diversion of effort may not add to the total catch from the area, nor will it reduce the total costs of fishing; but if the alternative stock is under-exploited, the total catch from the area will be increased.

40. For example, the new US fishery for yellowfin in the Eastern Tropical Atlantic has received much of its incentive from the closure in the Eastern Pacific under the regulations of IATTC. Whether or not such a diversion of effort is desirable depends on the degree of exploitation of the alternative stocks. It may be that the new US Atlantic tuna fishery adds little to the total world tuna catch, though increasing the US share.

41. The diversion from a regulated fishery may not necessarily aid the long-term development of an efficient fishery on the alternative stock. For instance, in the North Pacific many of the US and Canadian halibut vessels are used in other fisheries - salmon, bottom trawling, etc. - during the off-season. For these alternative fisheries they are less suitable than specially designed vessels, but the existence of the large halibut fleet has inhibited the development of specialist trawlers.

42. Further discussion of these points is difficult without reference to particular cases. It is sufficient to note here that one advantage of a licensing scheme is that if it is felt desirable it can be used in a purposive way deliberately to divert effort to an under-fished species. A limitation, or the need for limitation, implies that there is surplus capacity, in working or fixed capital (ships, etc.), that can be used elsewhere - not necessarily in fishing. If one alternative is to exploit another stock of fish that is under-exploited, the choice of licence holders or the relative magnitude of licence fees may be made so as to encourage the diversion of the surplus to that stock. This may be done quite explicitly, e.g. a condition of granting a licence to a company may be that it undertakes at least some trial fishing on the new area.

43. Less direct ways can also be used. For example, if a range of sizes of ships are fishing an inshore ground, which is over-exploited, while more distant grounds are neglected, it may be desirable at first to restrict licences for the near grounds to the smaller vessels (assuming that they can only fish near port), thus forcing the larger vessels to seek new grounds. In the short run, this would increase the economic effectiveness of the fleet as a whole, even if the larger vessels were the most suitable also for the nearer grounds. In the long run, however, it would be necessary first to reduce the small-ship fleet to that giving the optimum level of fishing mortality, and then gradually to allow the larger ships back into the fishery as replacements for the smaller ships.

(vi) By-catches in other fisheries

44. Catches made during the closed season while fishing for other species can present a major problem. Whaling is a special case where the species can be clearly identified before being caught; some other fisheries are to a greater or lesser extent confined to one species but trawling, the main method in the ICNAF area, inevitably catches a range of species. For the best uses of the resources as a whole, fishing on any under-exploited stock should be encouraged and this aspect is discussed more fully in the preceding section. Sometimes the value of the incidental catches of the regulated species is sufficient to make the difference between a profitable attractive fishery, and an unprofitable one; for example, the allowance of 15 percent yellowfin has probably increased the amount of fishing of skipjack in the Eastern Tropical Pacific during the closed season for yellowfin; conversely, the ban on landing trawl-caught halibut probably inhibited the development of a large local otter-trawl fishery in the North-east Pacific.

45. Another reason for permitting the landing of incidentally-caught fish is that few fish would survive if returned to the sea, so in the short view these could be no benefit to the regulated fishery, and a loss to the fisheries as a whole. There are exceptions: halibut are fairly tough, and a proportion will survive, and it is commonly supposed that in a slightly different context nearly all undersized lobsters and crayfish will survive if returned to the sea.

46. The existence of a right to sell incidentally-caught fish will have some effect on the pattern of fishing on the unregulated species, making it more attractive to fish where the regulated species is abundant. This will tend to increase the incidental catches, which is in itself not necessarily bad, provided they are taken account of in setting the quota. There may, however, be cases where in the long run the existence of an allowance will increase the amount of the regulated species which are discarded. This may be happening in the regulatory area of IATTC, where there is a 15 percent yellowfin allowance when fishing for skipjack. Because yellowfin fetches a high price some fishermen will ensure they will use the full allowance by fishing specifically for yellowfin during the early part of their trip, and then turn to skipjack. Then any yellowfin occurring in mixed schools etc., or misidentified will have to be dumped. This last problem seems to be less important in the ICNAF area, where the 10 percent allowance for regulated species caught with small-meshed trawls seem to have introduced no special difficulties.

(vii) Conclusions

47. The paper is not intended to provide more than some background material, and to provoke some discussion at the 1970 meeting of STACREM. It does not pretend to provide a precise guide to how limitation of the amount of fishing could be controlled in any specific situation. However, some general conclusions may be drawn, the chief of these being that, as might be expected, there is no one simple method that can be applied in all situations.

48. The measurement of the amount of fishing (strictly fishing mortality) can be in terms of catch (output), or fishing effort (input). The former involves short-term problems of taking into account year-to-year fluctuations in the abundance of the stock. The latter has possibly more serious long-term problems of taking into account (without discouraging) technical improvements in vessels and gear, including better searching techniques.

49. Control by a single national quota raises fewer problems at the time control is introduced, since it is generally non-discriminatory. However, in the long run the potential economic benefit will probably be dissipated by the entry of new capacity to the fishery, a shortening of the fishing season, and increased costs. Conversely, a limitation of entry, by a licensing system, offers better long-term prospects, but may raise serious social and other problems when it is introduced. It is suggested that if a general solution exists, it may require some combination of methods. For instance, the detailed control in a given year may be by a quota set in terms of catch, but the total capacity may be controlled by a licence system, in terms of vessels.

50. It is clear that much more study requires to be done on this field. In particular a detailed analysis and comparison should be made of the economic and social effects and the practical problems met in schemes already in existence. It is hoped that FAO will soon be involved in such a study, to enable it better to provide advice to several of the developing countries which are already meeting the need for regulation in their own fisheries.

II SUMMARY REPORT OF DISCUSSION AT MID-YEAR MEETING OF ICNAF STANDING COMMITTEE ON REGULATORY MEASURES

51. Below is given in summary form a report of the discussion at the meeting referred to in paragraph 1, for which the paper was prepared.

52. Although the internal arrangements which a country might make to apportion any quota allocated to it are quite clearly its own concern, there was widespread agreement that it was within the competence of STACREM to discuss ways in which such an apportionment might be made. In fact it was considered essential that some broad guidelines should be established, since nations would be reluctant to agree on quota regulations unless they could see the outline of a scheme which was applicable to their own particular situation, and which would give them some benefit.

53. There was no dissension from the view expressed in the paper that it would in the initial stages of a scheme be necessary to issue licences to all fishermen operating at the time of the scheme's introduction. This is, in fact, a common feature of a number of schemes referred to by delegates - some of which were described in some detail. One such scheme is that for the regulation of the salmon fishery in British Colombia. This licensed all fishermen in the industry, but allowed no further licences to be issued. The licences are renewable annually, but Class A licences permit the vessel to be replaced, while Class B do not. The distinction between Class A and Class B licences was made arbitrarily and fell roughly at an annual catch value of $1,250. Although in

the first two years of the scheme's operation there has been a reduction in fishing effort accompanied by a rise in average income, the extent of over-capacity in this fishery is such that either new measures will be required to speed up the withdrawal of effort, or the scheme will take a considerable period to achieve its objectives. The significant and relatively painless progress achieved so far was attributed - in part at least - to the comparatively attractive alternative employment opportunities available to the displaced fishermen.

54. The scheme described above merely licenses vessels, but the concensus of the meeting was in favour of the dual scheme outlined in the paper, i.e. licensing vessels to limit the fishing capacity and by some additional means apportioning the quota between licensed vessels to ensure that the desired fishing mortality is not exceeded. The means by which the quota might be apportioned was, however, one of the questions raised but not adequately dealt with during the meeting. Possible solutions ranged from administrative decree to a competitive auction. This is, however, almost certainly one of the aspects of any scheme which will be determined by the structure of the industry, the socio-political background and other considerations which do not permit any general answer.

55. Some of the problems likely to be encountered when the vessel is the unit in which the licence is expressed were commented on in paragraphs 23 and 31 of the paper. The main advantages of expressing the licence as, say a percentage of the national quota is that it allows the vessel owner to organise his operations as he wishes. If this system of allocation is adopted it does mean that there should be no abrupt changes in the national quota, since this could have a serious inhibiting effect on investment. It is, on the other hand, important that the quotas allocated to firms or fishermen should be negotiable assets - an arrangement which, by allowing the more efficient to buy out the less efficient, will increase the overall efficiency of the industry.

56. One further point on which the meeting was practically unanimous was the need for quick and accurate statistics, and the US arrangements for the haddock fishery were cited as an example of what was possible in this respect.

57. The necessity for each skipper to compile a log book at fairly regular intervals (each haul?) was also considered to be an essential feature in the enforcement of any quota regulation. Most countries reported that they already required their skippers to maintain logs. It was agreed that the Commission should ask the Panels to study the possibility of using a uniform or standard form of log book, and that licensed vessels should be required to make entries in respect of all catches and not merely those relating to catches in the area of regulation. This was considered to be useful, not only for scientific purposes, but also it might reduce the margin for the falsification of records in respect of the area of catch.

58. It was the view of some delegates that where a skipper had an incentive to cheat only spot checks at sea by plane or by boarding from patrol vessels would ensure a reasonable degree of veracity in reporting. A dissenting view was that of Canada, who considered that for a small vessel coastal fishery, such as operated from Nova Scotia and Newfoundland, a system for recording the catches at the point of landing would suffice. It was argued, therefore, that the regulations governing enforcement should be as flexible as possible.

59. It was pointed out that with a quota there would be an incentive to increase the fish discarded, since a country would wish to make up its quota with the best sized fish. Ideally, discards should be recorded in a log book, but this would in some cases be extremely difficult to check; the importance of this was emphasised by one estimate that discards could in some instances amount to 30 percent of the catch. If the fish are made into meal this offers some possibility of control, but the situation is complicated by the reduction of offal from filleting as well as the use of unregulated species. For the fish literally discarded and thrown back into the sea control is

almost impossible. A partial solution to this could be allowing for discards when fixing the total allowable catch, or alternatively supporting quotas by the introduction of larger mesh sizes.

60. In view of the necessity to limit entry into the fishery if the full economic benefits of regulation are to be obtained, there was some discussion as to whether member countries possessed the necessary legislative powers to limit entry. Many delegates were uncertain of the precise legal position in their countries. The US at present possessed no powers to prevent people from fishing; the UK had such powers. Many other countries were either in the process of drafting such legislation, or felt that powers could be taken within a reasonably short period.

III BIBLIOGRAPHY

Beverton, R.J.H. and S.J. Holt, On the dynamics of exploited fish populations. Fishery
1957 Invest., Lond.(2), 19. 533 p.

Christy, F.T. and A. Scott, The common wealth in ocean fisheries. Some problems of
1965 growth and economic allocation. Baltimore, Md, Johns Hopkins Press, 281 p.

Crutchfield, J.A. and G. Pontecorvo, The Pacific salmon fisheries; a study of
1969 irrational conservation. Johns Hopkins Press, 220 p.

Crutchfield, J.A. and A. Zellner, Economic aspects of the pacific halibut fishery.
1963 Washington, US Government Printing Office, Fishery Industrial Research, 1 (1).

FAO, The state of food and agriculture 1967. Food and Agriculture Organization of the
1967 UN, 119-44 p.

Gordon, H.S., The economic theory of a common-property resource: the fishery. J.polit.
1954 Econ., 62(2):124-42 p.

Graham, M., The fish gate. 2nd ed., London Faber
1949

Gulland J.A., Concept of the maximum sustainable yield and fishery management. FAO Fish.
1968 tech.Pap., 17. 13 p.

Gulland, J.A., The concept of the marginal yield from exploited fish stocks. J.Cons.
1968 perm.int.Explor.Mer., 32(2):256-61 p.

Gulland, J.A., Fisheries management and the limitation of fishing. FAO Fish.tech.
1969 Pap., (92)

Hamlisch, R. (Ed.), Economic effects of fishery regulation. Report of an FAO expert
1962 Meeting at Ottawa 12-17 June 1961. Working papers and record of discussions. FAO Fish.Rep., (5). 561 p.

ICNAF, Report of the Working Group on joint biological and economic assessment of con-
1968 servation actions. A.Proc.int.Commn.NW.Atlant.Fish., 17:48-84 p.

Schaefer, M.B., Some aspects of the dynamics of populations important to the manage-
1954 ment of commercial marine fisheries. Bull.inter.Am.trop.Tuna Commn., 1(2):26-56 p.

Scott, A., The fishery: the objective of sole ownership. J.polit.Econ., 63(2):116-24 p.
1955

Smith, J.T. and D.J. Fergusson, The Tasmanian crayfishery. An economic survey, 1964-65.
1969 Tasm.Fish.Res.,Suppl., 3(2).

Turvey, R., Optimization and suboptimization in fishery regulation. Am.Econ.Rev.,
1954 54(2) Part 1.

Turvey, R. and J. Wiseman (Eds.), The economics of fisheries. Proceedings of a round
1957 table organized by the International Economic Association and held in Rome in September 1956, and sponsored by the Food and Agriculture Organization of the United Nations. Rome, FAO.