

AN ECONOMIC ANALYSIS OF RESTRUCTURING THE SOUTH  
AFRICAN HAKE QUOTA MARKET

by

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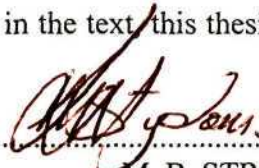
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I hereby certify that, unless specifically indicated to the contrary in the text, this thesis is the result of my own original work.

  
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## ABSTRACT

Hake is the most valuable fisheries species in South Africa, with an estimated landed value of R658 million in 1997. Fundamental restructuring of the South African hake fishery is however recommended by the White Paper on Marine Fisheries Policy (1997). This study aims at providing economic solutions to some of these problems of restructuring.

Management methods such as imposing upper limits on catches, access restriction (licenses), input restrictions and taxes have been shown to be unsuccessful at maximising economic rent generated by fisheries' resources. Hence the move by leading international fishing nations towards individual transferable quota (ITQ) management. According to the White Paper, South Africa intends pursuing very similar management techniques, to those employed by these leading countries, and it is therefore crucial that policy makers combine international experience with local knowledge and conditions, to draft the best possible fisheries' policy for the country.

Factor analysis of data collected from a postal survey of existing South African hake quota holders and rejected hake quota applicants, suggests that distinct differences in attitudes towards restructuring exist amongst respondents. Four factors, representing groups of respondents defined as, (1) applicants, (2) quota holders, (3) small scale respondents (comprising of both applicants and quota holders), and (4) larger, longer established quota holders, sharing similar attitudes towards restructuring, were extracted. *Applicants* seem concerned with having to compete with established business for quota, opposing any form of payment for quota. Applicants also opted for a rapid change from the status quo, to a free and open system of allocation, where quota is also allocated as a fixed tonnage, as opposed to a proportion of total allowable catch (TAC). Current *quota holders* on the other hand, seem more concerned with issues of self-utilisation and the effect paying for quota might have on present business operations. Another group of respondents defined as *smaller scale respondents* (comprising of both quota holders and applicants) demonstrated concern about the present imbalance in the

industry, where a few large companies receive the majority of quota. These respondents wish to see a rapid redistribution of quota, and a move towards a freer and open quota market. Analysis also revealed a group defined as *larger, longer established quota holders* whose primary concern seemed to be possible sudden reductions in quota allocation, and proposed methods of payment for quota. These companies have been receiving large allocations of quota in the past, and are therefore concerned with the impact restructuring might have on employment and international market share and competitiveness.

Discriminant analysis revealed that the most important variable discriminating between current quota holders and rejected applicants was grandfathering (issuing quota according to past allocation). The second most influential variable involved new entrants paying a predetermined price for quota, demonstrating applicants' opposition to paying for a resource which current quota holders have been receiving free of charge in the past. Allowing new entrants the right to on-lease quota to established operators, and the issuing of 'paper' quota, were ranked third and fourth respectively. This highlights the opposing views of current quota holders and applicants on the issue of new entrants receiving token allocations of quota, when they are often not in a position to utilise it, and making a windfall gain by on-leasing to established quota holders.

A substantial annual rent of approximately R279 million is generated by the South African hake industry, which is presently harvested free of charge by those issued with quota. These rents appear high relative to the landed value of hake of approximately R658 million. This may be evidence of the capital intensive nature of the hake industry, with large quota allocations needed to sustain an economically viable operation. Extraction of these rents through auctioning should be considered, while a portion of the TAC could be set aside for allocation to poorer communities.



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## INTRODUCTION

Hake is the most valuable fisheries' species in South Africa, with an estimated landed value of R658 million in 1997 (1996 landed mass has been used in conjunction with 1997 prices) (De Swardt, 1998). At present the hake fishery, along with seven other commercial fisheries, is managed under an individual quota system, where total allowable catch (TAC) is set annually and divided among quota holders free of charge according to past performance (grandfathering). Quota allocated under the present system is also only valid for one year.

International experiences in fisheries' management suggest that methods such as imposing an upper limit on catches, access restriction (licenses), input restrictions and taxes are often successful from a biological point of view at reducing over-exploitation, but unsuccessful from an economic point of view at maximising economic rent. Most leading fishing nations, including New Zealand, Australia, Iceland, Chile and Norway have therefore opted to do away with these management methods, and pursue a trend towards individual transferable quota (ITQ) management.

The present system employed in the South African hake fishery is in line with many leading international rights based management principles, however it involves a high degree of government intervention in allocating fishing rights. This has been identified by industry members as one of the reasons for the continued dominance of the industry by five 'pioneer' companies (of which two companies are by far the largest). These companies receive in excess of 80 percent of total annual hake quota allocation (Stuttaford, 1997). All quota is almost exclusively harvested by these five companies, catching their own allocations, as well as



harvesting on behalf of other smaller members of the industry. This, together with *inter alia*, the short term nature of tenure presently associated with quota, forced cuts in allocation to existing quota holders (to facilitate the introduction of new participants), and token allocations of quota to those 'previously excluded from the industry', has led to great dissatisfaction from within and outside the industry. This has prompted policy makers to formulate a new national marine fisheries policy, which at the time of printing had not been passed by Parliament.

A postal survey of existing quota holders, ranging from large vertically integrated companies to smaller processing and marketing operations, together with individuals attempting to enter the industry, in the form of rejected applicants, was therefore conducted. Attitudes towards current and future policy, methods of restructuring, and the present level of activity of the quota rental market were assessed and analysed. Discriminant analysis was also used to identify those variables which best differentiate between present quota holders and rejected hake applicants. The study also endeavours to calculate the annual rent generated by the hake fishery, as it is a stated White Paper objective to capture these rents. Proposed White Paper methods of accomplishing this have however not been well accepted by the industry.

Chapter one deals with the theory of institutions, with the intention of emphasising efficiency criteria in dealing with the common ownership problems faced by fisheries' resources. Chapter two reviews literature on international fisheries' management methods, focussing on management methods employed by leading fishing nations. Chapter three examines the South African hake industry, giving a brief history of its development, present structure and management. Chapter four describes the research methodology used in the study, and Chapter five presents the results obtained from a factor and discriminant analysis of data collected.

Chapter six concludes by emphasising the policy implications of the empirical findings, and suggests possible ways in which a new fisheries policy might meet economic efficiency criteria, while at the same time giving consideration to aspects of equity.

## CHAPTER 1

### INSTITUTIONS AND THE COMMON OWNERSHIP PROBLEMS FACED BY FISHERIES' RESOURCES

This chapter begins with a comparative analysis of the neo-classical and institutional approaches that deal with matters of economic efficiency. This is followed by a section on the common ownership problems faced by fisheries' resources, with particular reference to open access (or uncontrolled common ownership) and private ownership scenarios. The overview is not intended to provide a comprehensive review of the theory, but rather to emphasise those issues relevant to the efficient utilisation and allocation of marine resources, in the context of the present South African situation.

#### 1.1 Economic Efficiency: Neo-classical and Institutional Approach

The theory of institutions, and their relevance to a changing environment, are dealt with in this section. Allocative efficiency and equity, within the bounds of these institutions, play a major role in determining which management approach is best suited to the restructuring of the South African hake fishery.

##### 1.1.1 Institutions Defined

The effect of property rights structures and transaction costs on economic incentive and behaviour, has resulted in renewed interest in the theory of institutions (Furubotn and Richter,



1991). Definitions of institutions have converged over time with many elements in common. An institution is defined as the set of behavioural rules that govern a particular pattern of actions and relationships in society (Ruttan, 1978). Commons (1931) defines institutions as the outcome of collective action which constrains individuals' choices or bargaining through customs and laws. Commons contends that due to scarcity, there is a conflict of interests in human relationships. These conflicts are bargained out by goal-seeking individuals, who use whatever power they have been granted, to achieve goals which are influenced by future expectations (Miller, 1978). Institutions comprise rules and conventions that determine the behaviour of individuals with respect to one another (Runge, 1984; North, 1990). These rules may be self policed or policed by outside agents (Schotter, 1981). The way in which institutions are formulated and enforced make up the legal system of that society (Bromley and Cochrane, 1994).

In the area of economic relations, institutions have the crucial role of establishing expectations about the rights to resource use in economic activities, and about the distribution of income streams resulting from economic activity (Hayami and Ruttan, 1985). However, the right to a benefit stream defined by a property institution, is only as secure as the duty of others to respect the conditions that protect that stream (Bromley and Cochrane, 1994). If the state is unwilling or unable to protect an individual's rights, then the rights are worthless.

Institutions have a profound effect on the behaviour and future expectations of individuals. In essence, the effectiveness of a particular property institution in manifesting economic incentives that encourage desired behaviour, depends on two prerequisites; (1) how exclusively property rights are defined, and (2) how well transaction costs have been curtailed (Nieuwoudt, 1990).



### 1.1.2 Property Rights Defined

Modern institutional economics focuses on the institution of property, and the rules governing property rights (Furubotn and Richter, 1991). Property rights are a particular characteristic of property institutions, a subset of all institutions (Runge, 1985). Property rights reflect the norms of behaviour with respect to things that people must observe in their interactions with others, or bear the consequences of non-observance (Furubotn and Richter, 1991; Pejovich, 1990). Property rights reduce uncertainty by providing individuals with information that allows them to form more predictable expectations in their interactions with others (Demsetz, 1967; Runge, 1984).

Property rights are therefore an endogenous response to the need for economic coordination in the face of inter-dependence, and together with the market, serve to reduce real resource losses faced by individuals as a result of imperfect information or uncertainty. These losses are grouped together under the term 'transaction costs'. Dahlman (1979: 148) define transaction costs in a very similar manner as, "... the cost of making and enforcing a decision. Included are the costs of obtaining information, establishing one's bargaining position, bargaining and arriving at a group decision, and enforcing the decision made".

Property rights also play a crucial role in conveying returns of economic activity to the relevant agent. The initial allocation of property rights however, determines the distribution of income and wealth in society, as it determines who will benefit from a particular flow of income generated by the utilisation of resources. If transaction costs are positive, property rights will not transfer costlessly, and efficiency and equity are not separable.

### 1.1.3 Neo-classical Economic Approach

Neo-classical economists are largely concerned with the allocation of resources in a market economy, and the operation of demand and supply within that market. The neo-classical paradigm takes institutions as given, often applying Walrasian general equilibrium systems without regard for the complex institutions on which contracts in real world markets crucially depend (Bardhan, 1983). Price and quantity in the market are determined by equating supply and demand, and discounting imperfect information and uncertainty. When the market equilibrium is disturbed, in the Walrasian model, a new equilibrium is instantaneously restored because transaction costs are assumed to be zero. Prices alone are sufficient to ensure that resources are allocated to their highest valued use, and economic efficiency is ensured (Barzel, 1989). Under these highly idealised conditions, optimising behaviour by market participants brings about the most productive pattern of resource use for the entire economy (Pasour, 1990).

According to the neo-classical approach, economic efficiency is measured using the criterion of Pareto optimality (Arrow, 1985). Pareto efficiency is achieved when an individual's position cannot be improved without causing a deterioration in the position of another individual. The assumption of zero transaction costs takes the initial distribution of property rights as irrelevant, as these rights can be voluntarily and costlessly transferred to reach a new Pareto efficient allocation of rights (Coase, 1960). Consequently, the concepts of efficiency and equity become separable if the neo-classical assumptions hold (Bardhan, 1983). The shortfall of Pareto criteria is that it assumes the existing distribution of wealth, and the existing distribution of rights, is morally acceptable, i.e., the prevailing property institutions are therefore regarded as exogenous to the economic system (Ruttan, 1978).

### 1.1.3.1. Limitations of the Neo-classical Model

#### 1) Transaction costs

Coase (1960) states that regardless of the initial allocation of property rights, an efficient equilibrium will be reached in the market, provided the property rights are well defined and transaction costs are zero. While property rights provide information, and thereby reduce transaction costs faced by individuals, the process of defining and enforcing property rights is not costless, and information is scarce. In order for goods to be exchanged and realise their highest market value, property rights must be comprehensively defined (Furubotn and Richter, 1991). With non-zero transaction costs, rights pertaining to a good are not fully known, and exchange that would otherwise improve resource allocation may not take place (Coase, 1988). By the neo-classical approach ignoring transaction costs, it ignores a fundamental feature of reality (Furubotn and Richter, 1991).

#### 2) Equity

The Pareto optimality criteria used by neo-classical economists ignores the initial distribution of property rights, thereby handicapping this supposedly value-free measure. In the presence of transaction costs, efficiency and equity cannot be separated, and the flow of benefits from resources depends on who originally owns the resource (Bardhan, 1983). Pareto optimality is thus not free of ethical judgements, since it is based on the assumption that the existing distribution of rights is morally acceptable.



#### 1.1.4 Institutional Economics Approach

Having shown that the conventional neo-classical efficiency standards are unsatisfactory in real world situations, it is necessary to go beyond this ideological approach to include property institutions as endogenous variables in the economic system. The institutional approach therefore endeavours to extend the scope of neo-classical economics, by considering how institutions and transaction costs affect individual incentives and economic behaviour (Furubotn and Richter, 1991).

Economic agents have different perceptions of transaction costs and benefits attached to any market exchange of rights. The revealed choice behaviour of parties to potential exchange, is the only source of valuation of assets. Buchanan (1986) states there is no method whereby an external observer can determine whether or not observed levels of exchange stop short of an 'efficient' norm. As long as exchange is voluntary in a legal market situation, efficiency of resource use within an institutional setting is ensured. The implication is that resource allocation is dependent upon institutional arrangement, and that efficiency is only comparable between institutions and not within an institution.

Buchanan (1986) suggests that agreement is the ultimate test of efficiency. He argues that agreement on a change in the rules within which exchange is allowed to take place would be a signal that the previous rules were less preferred. However, it must be noted that resource allocation prior to institutional change was efficient given the constraints of that institution. Behaviour of the person who operated within the old set of rules was limited by the rules of that



institution. As such, institutional economics extends the neo-classical approach to include the reciprocal exchange of liberties (Buchanan, 1991).

## 1.2 Common Ownership Problems Faced by Fisheries' Resources

Fisheries are not the only natural resources to suffer the potential adverse effects of uncontrollable common ownership. Pioneering work in the field of fisheries' economics was conducted by Gordon (1954), Scott (1955), Turvey (1967) and Smith (1968), who realised that the issue was no longer whether fisheries' resources should be managed, but rather what management regime was best suited to a particular fishery type.

Hardin (1968) focussed attention on the difference between open access (*res nullius*) and common ownership (*res communis*). Open access refers to the situation where everybody and anybody is free to use the resource as they please. In the case of open access, there is no economic incentive to invest in the future productivity of the resource, as this investment will be dissipated between an uncontrollable number of users. Common property, on the other hand, refers to a resource which is commonly owned by the community or set group of people. In this case, access is regulated by the rules of the community, and although not an ideal environment for investment, it is more beneficial for resource conservation than open access (Tisdell, 1991).

To understand the over-harvesting problem faced by fisheries' resources, the competitive equilibrium position of an open access fishery is illustrated in Figure 1.1. Aggregate fishing effort is measured along the horizontal axis and denoted by  $E$ , and costs and revenues are

measured along the vertical axis. The total revenue (TR) curve represents total sustainable revenue at different levels of effort. At low catch levels, ie., the early development stage of a fishery, the curve illustrates that returns increase, albeit at a decreasing rate, with increased levels of effort. The curve eventually reaches a maximum (at  $E^{**}$ ), and tapers off as fish stocks become depleted. The second curve labelled total costs (TC) represents the total cost of fishing and rises as effort increases.

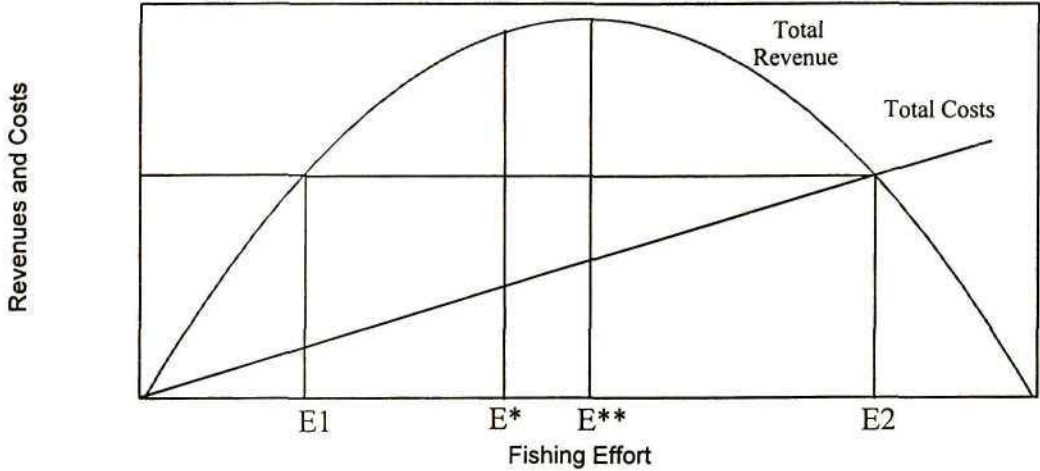


Figure 1.1: A comparative static model of a fishery (Kula, 1994: 50)

The equilibrium point, under an open access situation, is reached at  $E_2$ . At this point the fishery is said to have reached maturity, ie.,  $TC = TR$ , profits are zero, and there is no further expansion or contraction in fishing effort. At this point, however, there are no net economic returns (rents) to the fishery and the same catch (revenue) can be achieved with less effort at effort level  $E_1$  (Kula, 1994).

Maximum net returns are attained if fishing effort is reduced to level  $E^*$ , where the distance between the TR and TC curves is greatest. In order to find this point, the TC curve is moved in a parallel fashion towards the TR curve until it is tangent to it, point  $E^*$ . At this point the slope of the TR curve (marginal revenue) equals the slope of the TC curve (marginal cost). The economic criterion, the optimum sustainable yield (OSY), also referred to as the maximum economic yield (MEY) or optimum economic yield (OEY), aims to identify the level of fishing effort which yields maximum economic rent. At this level, fish stocks are at a sustainable level, ie., increased fishing effort is not required each successive season to maintain the current catch, and fish stocks are therefore extracted at a minimum cost to the industry (Arnason, 1992a). An increase in effort beyond  $E^*$  is undesirable because, for each additional unit of effort, the additional cost exceeds the additional revenue (Kula, 1994). This is however not what happens in practice, because under open access conditions, any level of profit realised encourages an increase in fishing effort.

Under open access conditions (or uncontrolled common ownership), anyone is able to enter the fishery and catch fish, or by the same token, existing members are free to increase catches. Under these conditions, fishers will compare the price of fish, or average revenue (AR), with the average cost (AC) of catching fish, when deciding whether or not to enter the fishery. As long as the price (AR) exceeds AC, they will enter. The existence of economic rents will therefore be responsible for attracting more and more fishers into the fishery. Under these conditions, fishers will continue to enter the fishery until  $AR = AC$  or  $TR = TC$ , point  $E_2$ . At this point, no economic rents are generated, and fishers together with society as a whole, bear the cost (opportunity cost) of revenue forgone due to poor management of the resource.



One of two scenarios often results in fisheries of this nature. Scenario one assumes that entry is stopped at effort level  $E_2$ . Due to increases in the cost of fishing, the TC curve shifts upwards. This widens the gap between the TR and TC curves, and a net loss of  $(TC - TR)$  occurs. Alternatively, in scenario two, the TC curve remains unchanged, but the price of fish falls. This would cause the TR curve to shrink inwards towards the X-axis, resulting in the same outcome, with TC exceeding TR, and a net loss resulting once again.

The response of fishers under these conditions should be to reduce fishing effort, either by some members leaving the fishery, or existing members reducing their catches, and by so doing restore the equilibrium to where  $TR = TC$ . This reduction, however, seldom happens in reality, and a number of reasons can be cited; (1) fishermen and women establish themselves in a tightly knit community and are very reluctant to leave and seek a livelihood elsewhere, (2) skills (human capital) developed by fishers may not be easily transferable to other sectors of the economy, and (3) other capital, in the form of fishing equipment and vessels, cannot be readily withdrawn and put to work in other sectors of the economy (Kula, 1994).

This ever worsening spiral of events often characterises open access or poorly controlled common property fisheries. The result being that poor communities get even poorer. It is ironically the poorly applied, or failed, management regime that gets blamed for the collapse of the fishery, when in fact it is the absence of stricter application and control of proposed management methods, that is sorely needed.

Many South African fisheries, although perhaps not the hake fishery, are faced with such a scenario. Management methods require vast reductions in the present level of utilisation to be



successful at breaking the spiral towards an even worse case scenario. This can be achieved either by present members decreasing their harvesting practices, or by some members exiting the fishery in pursuit of alternative employment.

## **CHAPTER 2**

### **A LITERATURE REVIEW OF INTERNATIONAL FISHERY MANAGEMENT**

A literature review of available management methods was conducted with the intention of identifying methods suitable for the optimum management of South Africa's hake fishery. Optimum management in the context of the present situation in South Africa does not only entail providing a sustainable stock of fish for future generations, but also for maximising economic returns to present generations at a time when equity considerations weigh heavily against efficiency criteria.

#### **2.1 Fishery Management Methods**

##### **2.1.1 Imposing an Upper Limit on Catches**

According to Wilen (1992), the biological control method of setting a total allowable catch (TAC), or upper limit, on the quantity of fish harvested in a particular season, is the minimum standard to which a management regime ought to be held. Arnason (1992a) states further that the TAC method works well to protect fish stocks but is unsuccessful at ensuring the economically efficient harvesting of fish stocks. Even if fish stocks increase due to TAC management, competition amongst fishers for a share of the TAC will result in increased fishing effort, and over- capitalisation by fishing firms. More and improved vessels and equipment will be purchased, and fishing effort will expand until all potential rents are dissipated.

Setting and enforcing biological fishery restrictions is invariably difficult and costly, and because this method captures no rent or economic profits to speak of, these costs represent a net loss. Biological management is therefore only recommended if it is the only alternative to the destruction of fish stocks (Arnason, 1992a)

### 2.1.2 Access Restriction

The most common method of restricting access is by means of licenses. 'License', in this case, refers to 'access' license, which gives the owner the right to participate in a fishery at a chosen level of effort. This should not be confused with the right to harvest a particular level of catch.

Access restriction, in the form of limiting the number of licenses, is an attempt to reduce fishing mortality, or harvesting levels, by limiting the number of fishing vessels. However, even from a biological perspective of conserving fish stocks, fishing mortality and fishing effort are seldom equivalent. Effort is produced, not only by the number of vessels, but by factors such as vessel size, engine type and horsepower, amount and type of gear, number of crew and time spent fishing (Waters, 1991).

Access restriction results in 'capital stuffing' (the enlarged fishing power of vessels by expanding unrestricted components) in a race to catch available fish stocks (Rettig, 1984). This method needs to be used in tandem with restrictions on input (or capacity) expansion, in order to correct the resultant distortion in resource allocation. Licenses do not eliminate the common property problem, they merely convert open access scenarios into common property situations, which under extensive conditions at sea, where exclusivity and control are almost impossible, are very

similar. Consequently, access restrictions are not seen as a biologically or economically viable solution to fishery management (Gullard and Correz, 1968).

### 2.1.3 Input Restrictions

Input restrictions, as opposed to access restrictions discussed above, aim to control the method of fishing and not the number of fishing units. However, potential gains from input restrictions, in the biological sphere, are eroded by having to control the use of all inputs, to avoid making the use of one input more attractive than another (Campbell and Haynes, 1990). There are a variety of different regulatory measures aimed at restricting specific inputs, such as; (1) limiting methods of harvesting, (2) closing certain sensitive areas and seasons, (3) limiting types of gear (mostly in the form of limitations on nets and mesh size), and (4) limiting total effort expended on fishing (often in the form of labour limitations). All these methods have an inherent weakness, in that any limitation can simply be avoided, and the identical outcome obtained by changing the resource mix in favour of a non-restricted input.

Input restrictions may however be applicable in those fisheries where control is a problem, and monitoring of catches is difficult in both geographical and financial terms. Output charges and quota restrictions (still to be discussed) are therefore not applicable under these circumstances, and the situation of “some control is better than none” prevails. In these extreme cases where no infrastructure exists to control and monitor catches, and/or control costs attached to alternative management methods are excessively high, input restrictions can be defended. The reason being, that economic benefits might outweigh the cost of higher input charges, brought about by



regulations resulting in fishers not having the freedom to choose the most economical resource mix applicable to a particular harvesting operation (Tisdell, 1991).

Access restrictions and input restrictions create an ever increasing spiral of management needs in an effort to close loopholes uncovered by fishers. Each regulatory adjustment offers temporary relief to fish stocks, but over time, additional effort will create the need for still more restrictions (Waters, 1991; Gardner, 1995).

#### 2.1.4 Taxes

Crutchfield (1961) maintains that taxes are theoretically the ultimate technique to ensure efficient utilisation of resources. In theory, a tax exactly equivalent to the unpaid resource rent, would make private factor costs equal to social costs, by altering the economic conditions of fishing firms, and thereby inducing them to behave in a socially optimal fashion (Arnason, 1992a). However, determining the precise magnitude of such a tax would require vast amounts of information, with authorities having to solve the social optimality problem as well as each firm's profit maximising function (Arnason, 1990).

There are many different types of corrective taxes that could be employed for this purpose, but broadly speaking they can be classified into four categories:

(1) Taxes on fishing inputs will generally lead to a substitution away from taxed inputs to inputs that are not taxed. But, due to the fact that inputs are not perfectly substitutable in the real world,

this method will generate some economic rents in the form of State collected taxes (Campbell and Haynes, 1990).

(2) Taxing catches or output is however a far more effective means of capturing the potential economic benefits of a fishery. The direct effect of a tax of this nature is to make the fishery less profitable. Thus, a tax of this nature reduces aggregate fishing effort by forcing less efficient harvesters to exit the industry. Therefore, in theory, by adjusting the tax, effort levels in the fishery can be adjusted to meet efficiency criteria (be it biological or economic) (Arnason, 1992a). Campbell and Haynes (1990), however, points out that any difference between the tax charged and the actual rent generated by the fishery will cause a departure from the optimum level of fishing. He continues to say that output and input based charges also have the inherent weakness of not being related to profitability, and it is profitability which should indicate the amount of rent in the fishery. The price of fish could fall so that rents are diminished, but the output charge would remain constant, and still have to be paid. If output and input charges were to reflect profitability, then the amounts (percentage or fixed) would have to be negotiated at frequent intervals. The negotiation process would be costly for both industry and administration (Campbell and Haynes, 1990).

(3) Profit based taxes are less distorting than input based charges, as they reflect the rent level more accurately. Profitability (and therefore the tax), can be measured by examining financial statements submitted for tax purposes. The tax levy can therefore be charged at the same time as individual or income tax, as a percentage of profits. Tax measured for these purposes, however, is not necessarily the same as economic profit. For example, depreciation may be

greater or smaller than allowed for by the State, and interest payment deductions may also distort true profit levels.

(4) Another alternative profit based tax, and a more neutral one, is on net cash flow. Problems encountered with depreciation are avoided since capital expenditure is deductible as and when it occurs. Interest is also not treated as a cash expense. In some years, cash flow will be negative because of capital expenditure, changes in stock abundance, or price changes. The property of neutrality, and therefore of no loss of economic efficiency, that a net cash flow charge has, will be retained only if the negative cash flows are used to offset positive flows in other years. Any negative cash flows carried forward should also be compounded by the relevant interest rate to reflect the time value of money.

Fishers as well as politicians, however, dislike the idea of taxes and for this reason, along with high administrative costs, taxes are not seen as a viable management option and have not been applied in any significant ocean fishery (Cassidy, 1973; Arnason, 1992a).

#### 2.1.5 Individual Transferable Quotas (ITQs)

ITQs have been widely heralded as the future in fishery management (Christy, 1973; Moloney and Pearse, 1979; Major, 1991). With this technique, an annual TAC is set and then divided up amongst quota holders according to the proportion of quota held by the individual or company. Quota holders then allocate their time and capital in the most cost effective manner, taking their share of the TAC at minimum cost (Hannesson, 1992a; Dewees, 1989). The minimum cost point



will only be aimed for in the sense that the opportunity cost of the quota rent is included (Nieuwoudt, 1998).

For these goals to be realised, however, the property rights must display three major characteristics; (1) security and durability, (2) exclusivity, and (3) transferability (Neher, 1996; Grafton, 1996). Security and durability enables fishers to conserve fish for harvest in future years, exclusivity minimises rush and unnecessary competition, and transferability ensures TAC is taken at the socially optimal level, as quota gravitates from less efficient to more efficient users (Randall, 1981).

Crothers (1988) concludes that the system of ITQ management can be credited with the following advantages and benefits:

- \* improved biological status of the resource;
- \* secure access to the resource (because rights are long term, if not permanent, and forward planning can be undertaken with confidence that access to the resource will not be withdrawn in the future);
- \* a market-orientated industry structured by market forces;
- \* reduced over-capitalisation;
- \* greater industry freedom, flexibility and responsibility;
- \* minimal government intervention;
- \* improved industry efficiency, competitiveness and profitability.



Pearse (1991) adds to this list, “improved economic returns to both the fishing industry and government”, made possible by the rent capturing capacity of the ITQ system. At the same time, pressure is reduced on fisheries’ management, so as to enable rationalisation of management structures employed and compensated by the State. Dewees (1989) also points out the shift from quantity to quality orientated harvesting. This is a result of guaranteed access to the resource. Fishers no longer have to race to catch the available stock of fish, and therefore employ methods which increase the landed value of fish (quality) as opposed to increasing the landed mass of fish (quantity).

Achieving a sustainable management policy is in itself a difficult task, with all the above management alternatives applicable to specific fishery characteristics. South Africa’s major fisheries currently operate under a system of individual quotas and this system has been particularly successful in rebuilding depleted hake stocks. However, determining who is entitled to these rights and how they should be allocated so as to be equitable and fair to all parties, is a monumental task. Information on the latter is contained in section 2.2 that follows, in the form of a literature review of alternative management strategies adopted around the world.

## **2.2 International Experience in Fishery Management**

The purpose of this section is to provide details of management practices used in other countries adopting similar methods to those employed in the South African hake fishery. It is recognised that South Africa is in the rather unique situation of having to restructure a fishery that is presently performing well in both biological and economic terms. However, valuable lessons can

be learnt from countries which have already undertaken transformation to a formal rights based management system.

### 2.2.1 Initial Quota Allocation Criteria and Tenure Period

The initial allocation of quota is a potentially controversial topic, and the legitimacy and stability of the system hinges on the fair initial allocation of these rights. Initial allocation has however been handled in a similar manner by most countries presently using the method of individual quota rights or ITQs.

**New Zealand** allocated quotas according to historical catch records (Boyd and Dewees, 1991) and the system is supplemented with an elaborate appeal mechanism (Annala, 1996). In **Australia's** southern bluefin tuna fishery, a formula for weighting the catch history and investment commitments is used to determine the initial allocation (Kennedy and Watkins, 1985). In both Australia and New Zealand quotas were initially distributed free of charge and in perpetuity, and there is limited taxation of catches or of quota held. In New Zealand previous plans to impose a resource rent tax have been shelved, and the fishery now pays only a small part of its management costs. In Australia it is a stated policy objective that fisheries should pay for their own management (Hannesson, 1992b).

In **Iceland** quota is allocated to vessels according to historical catches by means of two formats; (1) according to the vessel's catch in a certain base year, or (2) the vessel's average share of TAC over a three year period prior to ITQ introduction. Quotas were not sold, but issued free of charge with a small annual fee to cover enforcement and allocation costs (Arnason, 1992b).

In **Norway** TAC is divided between two groups; (1) vessels which exceeded a certain catch in one of the preceding three years were issued quota according to the size of their vessel (smaller vessels benefit from the system, as quota is issued according to the length of vessel, but a vessel twice the size of another vessel will receive less than twice the size quota), and (2) vessels not exceeding a certain catch were included in a group which fish from a common quota (Hannesson, 1992b). The vessel quotas were based on the length of the vessel, so that all vessels within a certain length category are allocated the same quota. This is a noteworthy departure from normal practices employed by other countries in allocating quota. The Norwegian quota allocations were designed in this way for reasons of fairness. It was felt that using the physical characteristics of the boat as a criterion would ensure that everybody was treated equally. But this system clearly discriminates against those that, for whatever reason, manage to do better than others with a given outfit, particularly since the transfer of quota between vessels was explicitly forbidden. The rationale for encouraging transfers is that if quota is transferable, quota will transfer to those who are able to extract a greater profit with a given outfit, and both buyer and seller would profit through bilateral negotiation. For this reason, the quota rules in the cod fishery are accused of paying no attention to economic efficiency. All the emphasis was put on fairness, or rather one definition of fairness. The system has since been relaxed and transfers of quota are now permitted (Hannesson, 1992a).

In **Chile**, rights to fish certain resources are allocated by auctioning ITQs. A certain percentage of the ITQ then relapses to the government each year and must be repurchased. These ITQs may be divided, transferred, sold and rented (Bergh and Barkai, 1993).



### 2.2.2 Annual Allocation of TAC: Proportional vs Fixed Tonnage

TAC can be divided up amongst quota holders in one of two ways; (1) quota is issued as a proportion (or percentage) of TAC, and (2) quota is allocated as a fixed tonnage that does not vary from year to year in line with fish stock fluctuations.

In **New Zealand**, ITQs were initially allocated as a specific tonnage. According to this system, annual TACs were to be increased or decreased (to be in line with biological stock assessments) by government entering the market and either buying or selling quota. When the ITQ system was introduced, it was proposed that a 'revolving fund', derived from resource rentals and quota sales, be created and used to buy-back this quota. This fund was however never created and resulted in taxpayers having to foot the bill of NZ\$ 45 million, as government was forced to buy-back excess quota as a result of incorrect stock assessments (when ITQs were first issued). This prompted government to change to a proportional system of allocation to avoid the State having to step in and buy-back quota in years of decreased TACs (Annala, 1996).

The flexibility of ITQs has also been used to buy quota to settle Maori claims on historic fishing rights (Bergh and Barkai, 1993). This came about when government expanded ITQ management to include all commercially significant species, a move which Maori tribes found unacceptable. Legal action was taken by the Maori to ensure their traditional rights to certain fisheries' resources. This led to great uncertainty in the industry with regards to both their existing property rights and the future implementation of ITQ management.



The dispute was however resolved by negotiations between government and the Maori which led to a settlement including *inter alia* the following conditions:

- \* 50 percent of New Zealand's largest fishing company, which had 25 percent of total allocated fish quota, transferring to Maori control;
- \* the transfer of 20 percent of all quota, for new species entering ITQ management, to the Maori;
- \* regulations to recognise and provide for the customary food gathering of the Maori, and prohibit the commercial harvesting of stocks in traditionally sacred Maori areas.

The settlement provided for the transfer of NZ \$500 million in assets to the Maori, giving them close to 40 percent control of the New Zealand commercial fishery (with the potential of acquiring a larger proportion of the resource with the funds provided by the settlement). The settlement made the Maori the single largest player in the fishing industry (Annala, 1996). It also protected the livelihood of existing quota holders by bringing security to the commercial fishing industry. The settlement prevented the Maori from advancing further commercial fisheries' claims, and ensured that the management of fisheries was not compromised by the Maori acting contrary to sustainable management practices.

This has important implications and lessons for South Africa, as it presently tackles many of the same problems already experienced by New Zealand. As Boyd and Dewees (1991) point out, the New Zealand government assumed it had the constitutional right to allocate quota in perpetuity (ie., that it '*owned*' the right on behalf of the nation). However, Maori claims on fishing rights had not been fully resolved, and as a result, all rights issued without the prior

resolution of this problem faced uncertainty in terms of long term security. Quota holders feared their rights would be eroded by Maori claims, and as a result, rights issued in the long term, or in perpetuity, did not have the property of secure tenure required to encourage investment and conservation.

In **Iceland**, quota is issued according to the proportion of the TAC held by a particular vessel. Each eligible vessel is then issued a share of TAC, which is permanent, divisible and fully transferable (Arnason, 1992b).

In **Norway**, quota allocation is calculated by multiplying the fleet's TAC by the vessel's base quota (which is determined by licensed cargo capacity, ie., size or length of each vessel) and dividing by the sum of the base quota, ie., a proportional system (Hannesson, 1992a).

## **CHAPTER 3**

### **THE SOUTH AFRICAN HAKE INDUSTRY**

This chapter begins with an introduction to the South African fishing industry as a whole. The chapter then continues with a brief history of the hake fishery, culminating in the present day structure of the hake quota register. Management methods presently employed in the hake fishery are then discussed, with the intention of contrasting them with those used by leading fishing nations. The chapter concludes with a very brief overview of proposed White Paper reforms, indicative of the direction government intends pursuing.

#### **3.1 Introduction**

South Africa's 200 mile (320 km) exclusive economic zone (EEZ) stretches some 3000 km from the Orange River mouth in the north-west to Ponta do Ouro on the Mozambique border in the north-east. More than 90 percent of the value and tonnage of the commercial fishery is however landed on the west and south coast of South Africa. In 1993, the total annual South African fishery landing (for all species) was about 0.7 percent (550 000 tons per year) of the total world catch (approximately 80 million tons per year). South Africa ranked 29<sup>th</sup> and 31<sup>st</sup> as a marine fishing nation in 1990 and 1991 respectively, but good catches in 1992 elevated it to 22<sup>nd</sup> position (South African Commercial Sea Fisheries Review, 1993). The wholesale value of South African landings in 1993 was over one billion rand, roughly two percent of South Africa's gross domestic product. The demersal fishery (bottom dwelling species) is by far the most commercially



valuable fishery. Although it only accounts for 35 percent of total tonnage landed, it makes up 50 percent of the wholesale value and is dominated by hake which is South Africa's main export earner in the fisheries' sector (Bergh and Barkai, 1993).

The majority of South Africa's fish stocks are not protected by a TAC at present. Only seven species are under the control of a rights based management system, where TAC is set and divided up among quota holders. These stocks include Hake, Sole, Pilchards, Anchovy, West Coast Rock Lobster, South Coast Rock Lobster and Abalone (Stuttaford, 1996). The hake industry will be discussed further, as the study focuses on the hake fishery, with the hope that lessons learnt in the hake fishery can help in the restructuring and development of other fisheries.

### **3.2 History of the South African Hake Industry**

Up until 1905 there was little demand for hake in the South African fish market, and hake was therefore not exploited to any great extent. The 'pre-industrial' fishermen of the Western Cape landed a mix of species made up of mostly snoek, and hake was landed in very modest quantities. The stable nature of the hake resource and its all-year availability, however, made it an ideal target for steam trawlers.

The South African industrial trawl fishery was based on steam power and originated in 1904 in Cape Town, with the formation of African Fishing and Trading Co. by G. D. Irvin. The company soon failed, but picked itself up again by entering into a co-operative with C. O. Johnson, then fishing out of Durban. This new co-operative also lost its original capital within the first two



years. Further capital was however procured and the two pioneers entered into partnership in 1910, merged as Irvin and Johnson (I&J) in 1912/13, and registered as a public company in 1922. Between the years 1910 and 1960, the industry witnessed a constant flow of new entrants, liquidations, amalgamations and take-overs. A number of people and companies did however manage to survive in the inshore trawl sector (to be discussed later), the primary reason put forward being that the inshore trawl sector is less capital intensive than deep sea trawl.

By 1960 the development of the trawling industry had become static. It seemed the struggle for the domestic market had been decided and the industry had settled into a natural monopoly. Things were however soon to change radically regarding both market structure and resource productivity. Amalgamated Fisheries (later Atlantic Trawling) was the first newcomer to enter the domestic market in 1963, followed closely by Kaap Kunene with five large ships, including the first freezer ship. Sea Harvest Corporation emerged in 1964 as a major force by virtue of its capital resources and the marketing and catching abilities of its parent companies (Atlantic Trawling being one). Marine Products, another one of the present five large operators, emerged in 1965.

The foreign 'discovery' of the south east Atlantic hake fishery occurred in 1963, and severe over-exploitation plunged the industry into crisis, the after-effects of which still remain today. The countries involved included Japan, Spain and many of the ex-socialist countries. The 200 mile EEZ was instituted in November 1977, and brought this pillaging of Southern Africa's marine resource to a long awaited end. The damage had however been done, and the South African hake catch in the south-east Atlantic had fallen to 15 percent of its previous total.

A pilot domestic TAC was set for 1978 (separate TACs were set for the inshore and deep sea trawl fisheries), but it was widely realised that a 'global quota' was ineffective. Capital resident in the industry crept upwards as participants competed to improve their position in anticipation of the final step in the evolution of rights. Company quotas were introduced in the deep sea trawl industry in 1979, the three 'foundation' companies (I&J, Atlantic Trawling and Sea Harvest) receiving 95 percent of the domestic TAC with the balance to three newly established smaller enterprises. The 28 small inshore boat owners, that traditionally trawled for sole in addition to hake, affiliated and have kept a separate identity since 1978. These trawler owners received individual quotas in 1982.

The familiar cycle of business failure and consolidation continued even during this more stable phase, and the control of two-thirds of the deep sea trawl industry quota changed hands in the period 1979 to 1983. The advent of a new minister in 1984 brought with it a new policy. Quota was reallocated, and new entrants were injected into the industry. In consequence of the resultant turmoil, government introduced the '80/20 agreement', whereby the original three companies got 80 percent of any increase in TAC, and the remaining 20 percent was used to facilitate the introduction of new entrants into the fishery.

The Diemont Commission was appointed in 1985 to report on issues pertaining to fishing rights, and its recommendations that existing rights and agreements be honoured, and a board be set up to allocate quota, were accepted. The Quota Board, which was established under the Sea Fishery Act (1988), and first sat in 1990, introduced 25 new participants into the hake industry under the 80/20 agreement. In addition to introducing these new entrants (made possible by increases in TAC due to stock recovery), the Board has since allocated hake quota to 38 new entities



including 28 quotas granted to Trusts (formed to promote economic development in poorer fishing communities). Quota holders pre-dating 1986 have not received any permanent increase in quota since the imposition of the Quota Board. The agreement, according to which existing quota holders would receive 80 percent of any increase in TAC, seems to have been discontinued by government, due to recent political pressure to incorporate new entrants into the industry (SA Deep Sea Trawling Industry Association, 1995).

The Inshore Trawl Fishery is a mixed species fishery, with some 17 different species of fish being caught by predominantly smaller vessels than those employed in the deep sea trawl sector. Commercially, hake and sole (both controlled by TAC and individual quota management) are the two most important species. Other species are not controlled by TACs, and there is no restriction on the amount of fish that can be caught.

In 1977, when the South East Coast Inshore Fishery was established, there were 42 members operating in this sector, but due to rationalisation, this number had reduced to 24 members by 1985, ranging from one-boat operators to multiple fleet owners and fish packers. Catching is done by relatively small vessels of 15 to 22 metres in length in water of up to 110 metres in depth. The general area of operation is from Kei Mouth in the east to Cape Hangklip in the west (Diemont Commission, 1986).

Besides the deep sea and inshore trawl fisheries, a number of other companies have made substantial investments in fish-processing facilities. Before individual quotas for hake and other white fish species were introduced, unprocessed fish was freely available to independent fish

processors. But after the introduction of individual quotas, these processors have found it increasingly difficult to obtain fish.

Applications were made by many of these processors, and five were chosen from among the applicants. These five companies formed the Independent Fish Processors Association (IFPA) and were granted 2500 tons of hake quota as well as the by-catch. In terms of an agreement between the Deep Sea Trawling Industry Association and the IFPA, fish are caught on a proportional basis by five deep sea fishing companies, and an equivalent of 500 tons is supplied to each of the independent fish processors (Diemont Commission, 1986).

### 3.3 Composition of the South African Hake Quota Register

In overview of the historical development of the South African hake industry, it was deemed necessary to include a present day view of the industry and resultant composition of the 1997 Hake Quota Register (Sea Fisheries' register of all 1997 hake quota recipients).

Table 3.1 demonstrates the industry domination by the **pioneer companies** mentioned in section 3.2. Irvin and Johnson Ltd. (I&J) and Sea Harvest Corp. (Pty) Ltd. are by far the biggest role players in the present-day industry, with Marine Products Ltd. (MarPro), Fernpar Fishing Company and Viking Fishing Company making up the remainder of the companies classified as 'pioneer' companies. These five companies receive approximately 80 percent of the deep sea trawl sector quota allocation. The **IFPA**, who's membership has increased to six members since inception in 1978, receive two percent of the deep sea trawl quota. **Tracherus Visserye**, receives



one percent of the deep sea trawl sector allocation, and is composed of seven members who receive an equal share of quota allocated to the group. '**Former Longliners**' include three companies who were issued experimental quotas to assess the commercial and biological viability of longlining for hake. '**Other Deep Sea**' trawl participant include six small operators who do not receive enough quota to run economically viable trawling operations. These quota holders contract out, together with most other quota holders in the deep sea trawl sector, to the five pioneer companies to harvest their allocation.

**New Entrants (1993)** resulted from a conscious policy effort to introduce new participants to the industry. Each of the four members received 1000 tons of hake quota. This allocation was however reduced in 1997, and their share of the quota market currently stands at three percent. Another 14 **new entrants** were allocated 4463 tons of quota (or 319 tons each) in 1996, followed in 1997 by another 15 **new entrants**, who received 3773 tons (or 251 tons each). Ironically, the introduction of 15 new entrants in 1997 meant that past allocations to new entrants, which were made on equity grounds, had to forfeit part of their allocation to provide quota for reallocation. A total of 2700 tons of hake was allocated to a Sea Fisheries **Longlining Experimental** project. This project was very valuable in identifying some of the problems associated with longlining for hake, and further expansion of the longlining sector has been put on hold as a result of the data obtained from this study. The experiment raised questions about the sustainability of the practice, as a large proportion of mature female fish were caught by the longlines (Japp, 1997).

A bilateral agreement between the South African and Mozambique governments, allocating **Mozambique** 1000 tons of hake, is the last remaining foreign recipient of hake quota. Reserves of 5000 tons make up the remainder of the 1997 TAC.

**Allocation to Community Trusts** were discontinued in 1996, in favour of forming more sustainable co-operatives. This allocation, it appears, was very much a token allocation, as quota was harvested by pioneer companies who paid the trust for their quota allocation, and the trust played no further role thereafter.

The **Inshore Sector**, composed of 11 members, is concentrated along the south eastern coast of South Africa from Mossel Bay to Port Elizabeth. The pioneer companies I&J, Sea Harvest (in the form of a subsidiary company) and Viking Fishing also dominate this sector with 42, 24 and 13 percent share of quota allocated to this sector, respectively.

Table 3.1: A summary of South African hake quota allocations (tons), 1995 - 1997.

	1997	1996	1995
<b>Deep Sea Trawl Sector</b>	Tons of Hake		
Pioneer Companies (n = 5)	114081	118834	118834
Independent Fish Prod. Assoc. (IFPA) (n = 6)	3008	3133	3133
Trachurus Visserye (n = 7)	1296	1350	1350
Former Longliners (n = 3)	1478	1540	1540
Other Deep Sea (n = 6)	1800	1143	1143
New Entrants (1993) (n = 4)	3840	4000	4000
New Entrants (1996) (n = 14)	4285	4463	0
New Entrants (1997) (n = 15)	3773	0	0
Longline Experiment	2700	2300	0
Mozambique	1000	1000	1000
Reserve	5000	2700	0
Community Trusts	0	0	6504
<b>Total Deep Sea Trawl Sector</b>	<b>142261</b>	<b>141166</b>	<b>138166</b>
<b>Inshore Trawl Sector</b>			
Inshore Trawlers (n = 11)	9440	9834	9834
<b>Total all Hake (n = 71)</b>	<b>151701</b>	<b>151000</b>	<b>148000</b>

Source: (Stuttaford, 1997 :13)

### 3.4 Management of the South African Hake Fishery

#### 3.4.1 Initial Quota Allocation Criteria

It was stated in the Diemont Commission of 1985/6, that quota allocation should not, except in certain exceptional cases, be made according to past performance. This was to ensure that no



new entrants were barred from entering the fishery. It however went on to say that allocation would be on the basis of traditional *pro rata* participation, which by definition cannot be separated from a measure which is based on past performance. Current practice, according to the Sea Fisheries Act of 1988 (based on recommendations by the Diemont Commission), allocates quota via the Quota Board on grounds of **past participation**.

The White Paper however proposes radically changing the present system of allocation, to a tender system, whereby bidders will tender on the criteria of both empowerment and past participation (Marine Fisheries Policy for South Africa, 1997).

#### 3.4.2 Annual Allocation of TAC: Proportional vs Fixed Tonnage

In 1985/6, the Diemont Commission investigated the feasibility of issuing existing quota rights on a permanent basis. The need to grant greater security of tenure was however confused with the problem of allocating a fixed amount of quota for more than one year, ie., a set tonnage which did not vary annually in line with fish stock fluctuations. The option of a proportional system, granting quota for a period of longer than one year, did therefore not receive fair consideration and was as a result not implemented.

Therefore, at present, annual allocation of quota to existing quota holders takes place according to a fixed tonnage system. From Sea Fisheries' records of the past seven years, it is ascertained that no major shifts in quota allocation have occurred and increases in TAC have primarily gone to new entrants. In 1997, 15 new entrants received 251 tons each, which was made possible by the across-the-board four percent reduction in allocation to existing members (See Table 3.1).



This reduction in allocation was later reversed, but new entrants did not lose their allocation. Hence pressure has been put on the resource, the effect of which still remains to be seen.

The White Paper states that under optimal management, TAC for the hake sector could rise by as much as 30 000 to 50 000 tons. This rise in TAC, and the resultant increase in the amount of quota available for allocation, needs to be thoroughly investigated when deciding whether a percentage or fixed tonnage system should be adopted.

Under a **fixed tonnage** system, an increase in TAC can be allocated to new members (by which ever method the government chooses to approve new applicants), thereby addressing the equity issue. However, according to this method, the government would be liable for shortfalls in allocatable TAC resulting from fish stocks fluctuating below the allocated fixed quota allotment. The State would then be forced to step in and buy-back excess quota from the market, as the New Zealand government had proposed to do, but later found to be unsustainable and a management intensive practice. The decision to adopt a fixed tonnage system, with increases in TAC being allocated to new entrants, might appear to be the short term solution to introducing new members into the industry, however due to the before-mentioned argument, it is not seen as a viable option.

Under the **percentage/proportion of TAC** method, two alternatives are available; (1) any increase in TAC can be distributed amongst all existing quota holders according to the proportion of TAC held, ie., the same proportion of a larger TAC, or (2) current proportions of TAC held can remain constant at a fixed tonnage, with the anticipated increase in TAC going to new entrants. Once the TAC has 'settled' at a long term equilibrium, these proportions of TAC can

then be entrenched as perpetual proportional allocations. According to this method, the government would be free of any liability resulting from fish stocks fluctuations.

### **3.5 Proposed White Paper Reforms to Fisheries' Policy**

This section is not intended to evaluate the proposed new policy options, but rather to give an overview of some of the contentious issues at hand. It was felt that this dissertation would not be complete without giving the reader an idea of the direction government intended pursuing.

Many reforms to the present policy governing marine fisheries have been proposed by the White Paper on Marine Resources, published in May 1997. Opposition to the White Paper was widespread, with various proposed changes being opposed by present quota holders as well as those intended to benefit from the new policy. The key issues included *inter alia* the following:

- (1) quota will be issued as a percentage of TAC;
- (2) quota rights will have to be purchased via a public tender in a once-off bidding process (the State not being compelled to necessarily accept the highest bid), with the purchase price, including the cost of managing the resource, being paid annually;
- (3) the right will be divisible, transferable and inheritable, with a ceiling on maximum tonnage associated with a single quota holder;
- (4) the right will revert back to the State within the allotted period, for example, a maximum term of 50 years will revert at a rate of two percent per year, and a minimum term of ten

years will revert at a rate of ten percent per year, ie., the entire quota share purchased will reverted back to the state over the allotted period, and;

- (5) as not all participants may wish to acquire long term rights, provision is made for the establishment of a commercial public company to enable industry participants to lease rights for a shorter time period of one or more seasons. The above-mentioned company will then lease quota to private individuals by holding an auction where rights are allocated on a 'competitive' basis to bidders who compete on criteria of black economic empowerment and previous participation in the industry (Marine Fisheries Policy for South Africa, 1997).

Consensus has not been reached on many of the above-mentioned issues, and reaction to the White Paper was still ongoing at the time of publication. Many emotional and highly political issues are raised in the White Paper; however, for any new policy to be successful, equity issues need to be tackled with sound economic grounding. It was thus felt that this dissertation could contribute in some way to the clearer understanding of some of the relevant issues from an economic perspective.



## CHAPTER 4

### RESEARCH METHODOLOGY

Described in this chapter is the study population, sampling techniques employed to collect data and methods employed to analyse the data.

#### 4.1 Study Population and Sampling Technique

A register of hake quota holders for the 1997 fishing season was obtained from the Department of Sea Fisheries. Of the 71 companies and individuals who received quota, 49 separate operational groups could be distinguished, ie., quota was issued to the same company operating in different sectors of the fishery, or quota holders joined forces and pooled their quota to form one operational and managed unit. All 71 members of the register were sampled by means of a postal survey, and 16 usable responses were returned. The Department of Sea Fisheries also maintained a register of 275 companies and individuals who unsuccessfully applied for hake quota for the 1997 fishing season. These 275 applicants were also sampled and 25 usable responses were returned.

In addition to information received from postal questionnaires, a trip was undertaken to Cape Town to personally interview personnel of the Department of Sea Fisheries, and authoritative members of the industry. Meetings were conducted with many staff members at the Department of Sea Fisheries, from which a great deal of knowledge was gained about the role played by

biological and administrative staff at the Department. The role of the Quota Board, in allocating quota to present and perspective quota holders, was also investigated. Meetings with industry members included, amongst others, the chairman of the Deep Sea Trawling Industry Association and Small Quota Holders Association. Many conflicting views on present and proposed policy measures were received, which gave valuable insight into the day-to-day dilemmas faced by those involved in the industry.

## **4.2 Data Analysis**

Apart from computing descriptive statistics (presented in section 5.1), factor analysis was used to identify relationships between variables, which describe more clearly the opinions and preferences of respondents. A discriminant analysis was then used to identify those variables which best differentiate between present quota holders and applicants (non-quota holders). Section 4.2.1 and 4.2.2 provide a brief overview of techniques used, and results are presented in sections 5.2 and 5.3.

### **4.2.1 Factor Analysis**

#### **4.2.1.1 Aims and Objectives**

Factor analysis was used to identify relationships amongst variables representing various opinions regarding restructuring the hake quota market. Components that could be meaningfully interpreted, led to a greater understanding of the variation in the data. Factor analysis

accomplishes this by replacing the set of existing variables with a new set of variables, defined by a linear combination of the original variables. The factors produced are uncorrelated, ranked in order of decreasing variance and measure different dimensions in the data (Manley, 1994). The percentage of variation accounted for is often rather low in studies of this nature, which reflects the complexity of the underlying structure, in the sense that it is not readily summarised (Crabtree, 1971)

#### 4.2.1.2 The Component Form

The component is of the form:

$$PC_1 = a_{11}X_1 + a_{12}X_2 + \dots + a_{1p}X_p \dots \dots (4.1)$$

where :  $X_1, X_2, \dots X_p$  are the original variables

The coefficients  $a_{11}, a_{12}, \dots a_{1p}$  are chosen such that  $PC_1$  accounts for the greatest share of the variance (or correlation) in the original  $p$  variables as possible (Nieuwoudt, 1977). Use was made of the correlation matrix and standardised variables since variables consisted of a number of qualitative and quantitative variables of different units (Steffens, 1983). The use of both qualitative and quantitative variables does not pose a problem in factor analysis, and factors obtained provide a plausible low-dimensional representation of data (Gower, 1966; Jolliffe, 1986). The percentage of correlation accounted for by the factor is represented by an eigen value. Eigen values with values of greater than one were included in the analysis, as they account for more of the correlation than the original variables. The above criterion was followed in this



study as it has proved particularly accurate when the number of variables is small (Stevens, 1983).

#### 4.2.2 Discriminant Analysis

##### 4.2.2.1 Aims and Objectives

Discriminant analysis begins with the desire to statistically differentiate between two groups of individuals, given measurements for individuals on several different variables (Manley, 1994). In this study, the two groups comprised of those companies that received hake quota, and those that did not receive quota after application. In order to distinguish between these groups, the researcher must assemble a set of explanatory or discriminating variables on which the two groups are expected to differ. Having selected the discriminating variables, the mathematical objective is to weight and linearly combine the variables so that the groups are forced to be as statistically distinct from one another as possible (Klecka, 1975).

##### 4.2.2.2 The Discriminant Function Form

The discriminant function is of the form:

$$D_i = d_1z_1 + d_2z_2 + \dots + d_pz_p \dots \dots \dots (4.2)$$

where :  $D_i$  is the i-th respondent's discriminant score on the function  
 $z_1 \dots z_p$  are standardised discriminating variables  
 $d_1 \dots d_p$  are coefficients that weight variables in the function

The coefficients are computed so as to maximise the ratio of the variance of  $D$  between the two groups relative to the variance of  $D$  within groups. The index  $D$  is an optimum linear discriminator between the groups. The relative contribution of each discriminating variable to the discriminating function is determined by the magnitude of its associated coefficient. The standardised coefficients ( $d_p$ ) reflect the relative importance of the independent variable ( $z_p$ ). Independent variables with relatively larger ( $d_p$ ) contribute most to the discrimination between the two groups (Klecka, 1975). The sign of the coefficient indicates whether the variable is positively or negatively related to  $D$ . In this study, variables which did not add to the discriminating power of the function were discarded using a stepwise procedure. The idea is to exclude variables which do not make a significant contribution to the separation between groups.

#### 4.2.2.3 Measurement of the Discriminating Power of the Function

Once a discriminant function has been estimated, it is necessary to assess its discriminating power. The function's eigen value is a direct measure of its discriminating power, ie. the greater the eigen value, the better the discriminating power of the function. Wilks' lambda is inversely related to the eigen value and provides a basis for testing the statistical significance of the function. A low value for Wilks' lambda implies better explanatory power. The explanatory power of a discriminant function can also be gauged by comparing its classification of sample cases with actual group membership.

Analysis refers to the interpretation of the original data, and to the interpretation of the discriminant function. The F-test can be used to check whether or not individual discriminating variables contribute to the separation of groups (quota holders and applicants). This test is valid

only if the explanatory variables are multivariate normally distributed. In practice, however, this technique is very robust. Violation of the assumptions do not render the analysis useless. If the discriminant scores are univariately normally distributed for each group, the analysis is still statistically reliable (Truett *et al*, 1967:521). In practice, this assumption can also be checked by observing the distribution of discriminant scores ( $D_i$ ), estimated for each group. If the distribution is approximately normal, the test is considered valid. The degree of overlap in the distributions plotted for each group also provides a visual measure of the function's explanatory power. The smaller the overlap, the better the function.

#### 4.2.2.4 Variables Considered in the Discriminant Analysis

Variables expected to discriminate between quota holders and applicants are presented in Table 4.1 and discussed in this section. A dependent variable **DISCRIM** was constructed using one (1) for *applicants* who applied for hake quota for the 1997 fishing year, but did not receive any, and zero (0) for existing *quota holders* who received quota for the 1997 season.



Table 4.1: Definition of variables included in the discriminant analysis.

Variable	Definition
<b>DISCRIM</b>	= 1 for non-quota holders (applicants) and 0 for quota holders.
<b>AUCTION1</b>	= 1 if respondent agrees with the auctioning of quota to everyone, 0 otherwise.
<b>G/FATHER</b>	= 1 if respondent agrees with issuing quota according to past performance, 0 otherwise.
<b>GRADUAL</b>	= 1 if respondent agrees with a gradual decrease in quota allocation to existing quota holders, 0 otherwise.
<b>FREE</b>	= 1 if respondent agrees with issuing quota to new entrants free of charge, 0 otherwise.
<b>PREPRICE</b>	= 1 if respondent agrees with issuing quota to new entrants at a predetermined price, 0 otherwise.
<b>AUCTION2</b>	= 1 if respondent agrees with the auctioning of quota to new entrants, 0 otherwise.
<b>PAPER_Q</b>	= 1 if respondent agrees with the allocation of 'paper' quota, 0 otherwise.
<b>LEASE</b>	= 1 if respondent agrees with allowing new entrants to lease quota to other companies, 0 otherwise.

#### Auctioning quota to everyone (**AUCTION1**)

It was tested whether quota holders would oppose (support) and applicants support (oppose) government intentions to implement a payment system to capture rents generated by the hake industry. It was expected that existing quota holders who have received quota free of charge in the past, would not be willing to pay for quota. Rejected applicants, wishing to gain access to the fishery, were also not expected to support payment. However, since they are unable to acquire quota via present allocation channels, they may support auctioning, as this would ensure free and open access to all those aspiring to join the industry. **AUCTION1** equals 1 if respondent agrees with statement, 0 otherwise.

### Grandfathering (G/FATHER)

It was hypothesised that grandfathering would be opposed by applicants who feel they have previously been unjustly overlooked for quota allocation. Present quota holders on the other hand were expected to support grandfathering. **G/FATHER** equals 1 if respondent agrees with grandfathering, 0 otherwise.

### Gradual decrease in quota allocation to existing quota holders (GRADUAL)

Applicants were expected to oppose a gradual change to the present allocation structure in pursuit of a rapid redistribution of quota to those 'previously excluded'. A gradual decrease in quota allocation was however expected to be favoured by existing quota holders who wish to see the inevitable redistribution of quota take place without too much disruption to the quota market. Many existing quota holders have voluntarily held back on past catches and invested heavily in exploring new resources for the future. They would therefore like to recapture some of their investment before quota is reallocated. **GRADUAL** equals 1 if respondent agrees with statement, 0 otherwise.

### Allocate quota to new entrants free of charge (FREE)

Allocating quota to new entrants free of charge was expected to be favoured by applicants and opposed by existing quota holders. **FREE** equals 1 if respondent agrees with statement, 0 otherwise.

Allocate quota to new entrants at a predetermined price (**PREPRICE**)

Allocating quota to new entrants at a predetermined price (seen as a proxy for making new entrants pay for quota), was expected to be favoured by quota holders and opposed by applicants. New entrants were not expected to support a system whereby they pay for a resource which existing quota holders have received free of charge in the past. **PREPRICE** equals 1 if respondent agrees with statement, 0 otherwise.

Allocate quota to new entrants by means of an auction (**AUCTION2**)

The present system of allocating quota to new entrants free of charge results in many individuals applying for (and receiving) quota which they have no intention of using. This results in new entrants on-leasing the quota to an established operator, who benefits from the economies of size derived from the extra quota. Auctioning quota to new entrants would result in only those individuals with a genuine intention of utilising quota bidding for it. This quota would therefore not be available to existing quota holders to lease. Existing quota holders were therefore expected to oppose the auctioning of quota to new entrants. Applicants, on the other hand, were expected to support the auctioning of quota. It was reasoned that with only a very slim chance of receiving quota (only 15 of 290 applicants in 1997 received quota), auctioning would allow them greater access to a fishery previously only accessible to a privileged few who were bureaucratically issued with quota. **AUCTION2** equals 1 if respondent agrees with statement, 0 otherwise.



### Issuing of 'paper' quota (**PAPER\_Q**)

The issuing of 'paper' quota was hypothesised to be supported by applicants, but opposed by present quota holders. There are presently individuals who have received 'token' allocations of quota, although they may not have any intention of utilising it. It was hypothesised that within the set of applicants there may be those who hope to benefit from this present weakness in the allocation system. **PAPER\_Q** equals 1 if respondent agrees with statement, 0 otherwise.

### Allow new entrants to lease their quota to other companies (**LEASE**)

Quota allocated to new entrants was examined separately to quota allocated to existing quota holders. It was hypothesised that existing quota holders would oppose a system where quota was reallocated to new entrants (at the expense of existing quota holders), simply to be leased back by existing members at a windfall gain to the new entrant. New entrants on the other hand, were expected to support leasing quota to other companies. This could be for one of two reasons; (1) new entrants wish to make a windfall gain from a 'token' allocation of quota (often allocated with the aim of empowerment), and (2) those new entrants with a genuine intention of using their allocation may need time to get operations up and running, and as a result, on-lease their quota to other companies until such a time as they are in a position to utilise it themselves. **LEASE** equals 1 if respondent agrees with statement, 0 otherwise.

## CHAPTER 5

### RESEARCH RESULTS

This chapter begins with statistics reflecting the size and geographical position of respondents. This was done with the intention of giving the reader some indication of the nature and location of respondent operations. This is followed by an examination of data contrasting responses received from present quota holders and rejected applicants. Results obtained from the factor and discriminant analysis are then presented, followed by a section aimed at estimating the rent generated by the hake fishery.

#### 5.1 Descriptive Statistics

##### 5.1.1 Respondent Characteristics: Size and Location

Respondents were clustered around the Western Cape (See Table 5.1), with 56 percent of *quota holders* situated west of Cape Town, 25 percent in Cape Town, six percent in Mossel Bay, and 13 percent east of Mossel Bay. Forty-eight percent of *applicants* were situated west of Cape Town, 12 percent in Cape Town, 20 percent between Cape Town and Mossel Bay, four percent in Mossel Bay, eight percent east of Mossel Bay and eight percent of applicants who responded were not from coastal areas. Most deep sea trawling companies were situated in an area around Cape Town and extending up the west coast as far as Saldana Bay, while the majority of

companies operating in the inshore trawl sector are situated east of Cape Town, and clustered around Mossel Bay.

Table 5.1: Geographical location of respondents, 1997.

Location of Respondent	Quota Holders (n = 16)		Applicants (n = 25)	
	freq	%	freq	%
West of Cape Town	9	56	12	48
Cape Town	4	25	3	12
Cape Town to Mossel Bay	0	0	5	20
Mossel Bay	1	6	1	4
East of Mossel Bay	2	13	2	8
Other	0	0	2	8

Data revealed the size of allocations differed vastly amongst *quota holders*, the breakdown of which can be seen in Table 5.2. Three respondents received less than 200 tons, eight between 200 and 499 tons, two between 500 and 999 tons, and three in excess of 1000 tons. Those companies receiving in excess of 1000 tons were the pioneer companies mentioned in sections 3.2 and 3.3, three of which replied to the questionnaire. Not only do these companies dominate quota allocation, but they dominate harvesting to an even greater extent, harvesting 87 percent and 85 percent of the total hake catch in 1995 and 1996 respectively (Department of Sea Fisheries, 1997).



Table 5.2: Size of quota allocations to existing holders, 1997.

Size of Allocation	Number of Respondents (n = 16)	
	freq	%
0 - 199 tons	3	19
200 - 499 tons	8	50
500 - 999 tons	2	12
1000 + tons	3	19

### 5.1.2 Fixed Tonnage vs Proportional Allocation

Fifty percent of *quota holders* (n = 16) indicated quota should be allocated as a percentage of TAC, whereas 83 percent of *applicants* (n = 23) advocate a fixed tonnage system, where tonnage allocated does not vary from year to year in line with fish stock fluctuations. Applicant support for a fixed tonnage system may be representative of a minimum threshold tonnage, below which small operators would not survive the ill-effects of poor years.

A question relating to the minimum economically viable quota size was therefore posed to *applicants* and responses ranged from 200 tons to 5000 tons (mean = 1423 tons and median = 1000 tons) (n = 14) for trawling and 100 tons to 2000 tons (mean = 468 tons and median = 375 tons) (n = 14) for longlining. *Applicants* also envisaged the minimum start-up capital required for an economically viable trawling and longlining operation to range from R250 000 to R5 000 000 (mean = R2 070 833 and median = R2 250 000) (n = 13) for a trawling operation, and R50 000 to R2 000 000 (mean = R625 333 and median = R400 000) (n = 15) for a longlining operation (See Table 5.3).

Table 5.3: Applicant opinion on minimum trawling and longlining quota and capital requirements, 1997.

Type of Operation	n	Mean	Median
Minimum trawl quota	14	1423 tons	1000 tons
Minimum longlining quota	14	468 tons	375 tons
Minimum trawl capital	13	R2 070 833	R2 250 000
Minimum longlining capital	15	R625 333	R400 000

### 5.1.3 Tenure Period

Quota holders and applicants stated a preference for quota with a longer term of tenure, with only ten percent of *all respondents* (n = 29) supporting the present one year tenure period (Table 5.4). Preference for a longer tenure period can be attributed to large investments in resource assessments, harvesting and processing equipment, and marketing infrastructure and networks.

Table 5.4: Quota holder and applicant opinion on tenure period, 1997.

Tenure period	Quota Holders (n = 6)		Applicants (n = 23)	
	freq	%	freq	%
In perpetuity	1	16	7	30
11 to 30 years	3	50	5	23
6 to 10 years	1	17	1	4
2 to 5 years	1	17	7	30
1 year	0	0 (10 %)	3	13

5.1.4 Accumulation of Quota for Reallocation

Opinions regarding the accumulation of quota for reallocation to new entrants are presented in Table 5.5. Sixty-two percent of *quota holders* and 61 percent of *applicants* support rapid reallocation of quota (within five years). It was reasoned that applicants would opt for rapid reallocation, while existing quota holders would opt for a gradual change from the present quota allocation structure from which they benefit. These figures, however, seem to indicate the contrary.

Table 5.5: Quota holder and applicant opinion on methods of accumulating quota for reallocation to new entrants, 1997.

Method of Accumulating Quota for Reallocation	Quota Holders (n = 16)		Applicants (n = 23)	
	freq	%	freq	%
Once-off percentage decrease	5	62 %	10	61 %
Percentage decrease over 1 to 5 years	5		4	
Percentage decrease over 6 to 10 years	0	0	5	22
Wait for TAC to increase	6	38	4	17

5.1.5 Self-utilisation of Quota Allocation

According to Table 5.6 (a five category scale ranging from ‘strongly disagree’ to ‘strongly agree’ with the statements given, was used to elicit the intensity of respondents’ opinions), 94 percent of *quota holders* (n = 16) and 88 percent of *applicants* (n = 25) support the self-utilisation of quota by everyone being a prerequisite for allocation. Self-utilisation by new entrants only was supported by all quota holders (n = 16) and 84 percent of applicants (n = 25). This concept,



which is again advocated by the White Paper, has been policy in the past, but has not always been strictly enforced. Attitudes towards the issuing of ‘paper’ quota (quota not utilised directly by holder), which is in essence the opposite of self-utilisation, were therefore also examined, and opposed by all *quota holders* (n = 16) and 68 percent of *applicants* (n = 25). This further emphasises support for the enforcement of self-utilisation.

Table 5.6: Quota holder and applicant opinion on self-utilisation, 1997.

Statement		Number of respondents in each category				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Government regulation, where government or allocation board issues quota to quota holders who <b>must utilise quota themselves</b> in order to qualify for allocation.	Quota holders (n = 16)	11	4	0	0	1
		94 %				
	Applicants (n = 25)	16	6	1	1	1
		88 %				
Allocate quota to new entrants, but they have to <b>utilise quota themselves</b> in order to qualify for allocation.	Quota holders (n = 16)	12	4	0	0	0
		100 %				
	Applicants (n = 25)	15	6	2	0	2
		84 %				

5.1.6 Auctioning of Quota

Eighty-eight percent of *quota holders* and 85 percent of *applicants* opposed auctioning quota to everyone, while auctioning quota to new entrants only was opposed by 69 % of *quota holders* and 88 % of *applicants* (Table 5.7). With the slim chance of an applicant receiving quota (five percent in 1997), it was reasoned that applicants would prefer an auctioning system where access was open and free. These figures suggest that White Paper proposals to implement a bidding

system, where small operators may purchase rights on a short term basis, may encounter resistance.

Table 5.7: Quota holder and applicant opinion on auctioning, 1997.

Statement		Number of respondents in each category				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Auction quota to <u>everyone</u> .	Quota holders	0	1	1	6	8
					88 %	
	Applicants	1	1	1	8	14
					85 %	
Auction quota to <u>new entrants</u> only.	Quota holders	4	1	0	6	5
					69 %	
	Applicants	1	2	0	4	18
					88 %	

## 5.2 Results of Factor Analysis

Fourteen variables representing varying opinions on restructuring were included in the factor analysis. Four factors, having eigen values greater than one, and accounting for 67.9 percent of the variation in the data, were retained. Results of the analysis are presented in Table 5.8.



Table 5.8: Loading of factors representative of groups sharing common opinions on restructuring.

Factor	Applicants	Quota holders	Small scale respondents	Larger, longer established quota holders
Eigen Value	3.361	2.771	1.785	1.588
Percentage Correlation Explained	24.0	19.8	12.7	11.3
Auction quota to everyone (0 = Disagree; 1 = Agree)	0.427	0.487	-0.001	0.159
Grandfathering (0 = Disagree; 1 = Agree)	0.637	0.146	-0.301	0.356
Lower initial purchase price, followed by higher annual levies (0 = Disagree; 1 = Agree)	-0.112	-0.354	0.266	0.625
Gradual decrease in quota allocation to existing quota holders (0 = Disagree; 1 = Agree)	0.427	0.133	0.443	0.502
Allocate quota to new entrants free of charge (0 = Disagree; 1 = Agree)	-0.713	0.366	-0.264	-0.140
Allocate quota to new entrants at a predetermined price (0 = Disagree; 1 = Agree)	0.454	-0.509	0.497	-0.362
Allocate quota to new entrants by means of auction (0 = Disagree; 1 = Agree)	0.423	-0.539	0.320	0.128
Issuing of 'paper' quota (0 = Disagree; 1 = Agree)	-0.078	0.655	0.195	0.160
Regulated quota transfer market for everyone (0 = Disagree; 1 = Agree)	-0.194	0.245	0.422	-0.670
Allow new entrants to lease their quota to other companies (0 = Disagree; 1 = Agree)	0.365	0.690	0.343	-0.223
Allow new entrants to lease their quota only to control body (0 = Disagree; 1 = Agree)	0.478	0.506	0.538	-0.003
Fixed tonnage system (0 = Disagree; 1 = Agree)	-0.768	-0.239	-0.017	0.288
Labour employed (Number of employees)	0.495	0.266	-0.580	-0.098
Group membership (Quota holder = 0; Applicant = 1)	-0.666	0.580	0.223	-0.010
	* '+' oppose '-' support	* '+' oppose '-' support	* '+' oppose '-' support	* '+' support '-' oppose



The first factor represents a set of respondents, defined as applicants, or those respondents unable to join the industry under present policy. This factor accounted for 24.0 percent of total variation in the data (Table 5.8) and gave high factor loadings to opinions viewed strongly by these members. Applicants seemed concerned with having to compete with established business for quota, therefore opposing any form of payment for quota. Applicants also opted for a rapid change to a less regulated system of allocating quota, where quota is also allocated as a fixed tonnage as opposed to a proportion of TAC (Table 5.9).

Table 5.9: [First Factor] Applicants’ attitudes towards aspects of restructuring.

<u>Support:</u>	<u>Oppose:</u>
1) the free issuing of quota to new entrants	1) grandfathering
2) a fixed tonnage system of allocation	2) allocating quota to new entrants at a predetermined price
	3) auctioning quota to everyone
	4) auctioning quota to new entrants only
	5) a gradual reduction in quota allocation to existing quota holders
	6) allowing new entrants to lease quota only to relevant control body

The second factor accounted for 19.8 percent of total variation in the data (Table 5.8), and assigned high factor loadings to opinions viewed strongly by quota holders. These are respondents who have received quota in the past according to historical performance. They do

not wish to see quota reallocated amongst an uncontrollable number of smaller operators who often do not have the resources to efficiently utilise their allocation. Hence, the strong support for self-utilisation and the introduction of payment for quota by new entrants, demonstrated by this group. Opposition to auctioning quota to everyone was expected as these respondents have received quota free of charge in the past (Table 5.10).

Table 5.10: [Second Factor] Quota holders’ attitudes towards aspects of restructuring.

<u>Support:</u>	<u>Oppose:</u>
1) issuing quota to new entrants at a predetermined price	1) auctioning to everyone
2) auctioning quota to new entrants only	2) the issuing of ‘paper’ quota
3) the self-utilisation of quota allocation	

The third factor, representing *smaller scale respondents*, accounted for 12.7 percent of the total variation in the data (Table 5.8). This group, comprising of small quota holders and applicants, are unhappy with the present imbalance in the quota market. They wish to see a rapid change to the present allocation mechanism and structure, where those wishing to obtain quota, either for the first time, or to expand their present size of operation (in the case of current quota holders), could do so in an open and free market (Table 5.11).

Table 5.11: [Third Factor] Small scale respondents’ attitudes towards aspects of restructuring.

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<b><u>Oppose:</u></b>
1) allocating quota to new entrants at a predetermined price
2) a gradual reduction in quota allocation to existing quota holders
3) regulated quota transfer markets

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The fourth factor represents ***larger and longer established quota holders***, and accounts for 11.3 percent of the total variation in the data (Table 5.8). These respondents seem concerned with the threat of sudden reductions in quota allocation and proposed methods of payment for quota. These companies have received large allocations of quota in the past, and are therefore concerned with the impact restructuring might have on employment and international market share and competitiveness. Opposition to regulated quota transfer markets was also expected (Table 5.12).

Table 5.12: [Fourth Factor] Larger and longer established quota holders’ attitudes towards aspects of restructuring.

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<b><u>Support:</u></b>	<b><u>Oppose:</u></b>
1) a gradual reduction in quota allocation to existing quota holders	1) regulated quota transfer markets
2) lower initial purchase price of quota, followed by higher annual levies	

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5.3 Results of Discriminant Analysis

A discriminant analysis was undertaken to determine which opinions were associated with, and distinguished between, existing quota holders (coded as 0) and applicants (coded as 1). Results of the discriminant analysis are presented in Tables 5.13 and 5.14.

Table 5.13: Estimated discriminant function distinguishing between quota holders (0) and applicants (1).

Explanatory Variable	Standardised Coef.	F-value
Issuing quota according to past performance ( <b>G/FATHER</b> )	1.129	38.99*
Issuing quota to new entrants at a predetermine price ( <b>PREPRICE</b> )	0.808	15.84*
Allowing new entrants to lease quota to other companies ( <b>LEASE</b> )	-0.566	6.29*
Issuing ‘paper’ quota ( <b>PAPER_Q</b> )	-0.485	4.44*

\* significant at the 1 % level of probability

F-value	18.23*
Wilks’ Lambda	0.318
Canonical correlation	0.826

All signs were according to *a priori* expectations, with the main variable discriminating between quota holders and applicants being **G/FATHER**, allocating quota according to past performance (Table 5.13). The second most important variable was **PREPRICE**, allocating quota to applicants at a predetermined price. The importance of this variable was seen to demonstrate the contradicting opinion on new entrants having to pay to enter the market. **LEASE**, allowing new entrants to lease their quota share to other companies, was the third most important discriminating variable, and **PAPER\_Q**, the allocation of ‘paper’ quota was the fourth most

important discriminating variable. The inclusion of these last two discriminating variables in the function is evidence of the opposing views held by current quota holders and those individuals attempting to join the industry on self-utilisation and token allocations of quota.

The overall F-value ( $F = 18.23$ ) indicates the four independent variables retained together significantly discriminate between quota holders and applicants. A Wilks' lambda of 0.318 and a canonical correlation coefficient of 0.826, indicate the function is effective in classifying respondents correctly. The percentages of correctly classified results are (Table 5.14): 93.8 percent of quota holders, 96.0 percent of applicants and 95.1 percent of overall cases.

Table 5.14: Summary of grouped cases correctly classified.

Actual Group	No. of Cases	Predicted Group Membership	
		(0)	(1)
Quota holders (0)	16	15 (93.8 %)	1 (6.3%)
Applicants (1)	25	1 (4.0%)	24 (96.0 %)
Percent of 'grouped' cases correctly classified:			95.1 %

## 5.4 Quota Rent

No permanent transfers of quota have taken place in recent years, however rental transfers are common (Fourie, 1997). Quota holders indicated that 1997 quota was renting for prices ranging from R1.75/kg to R1.90/kg (mean = R1.84/kg) ( $n = 8$ ), a figure which is consistent with information received from telephonic and personal interviews conducted with industry members (See Figure 5.1, distance BC). This figure combined with 151 701 tons of hake allocated in 1997

(distance OG), amounts to R279 million in annual hake quota rents (area ABCD). Figure 5.1 is adapted from Doeringer and Terkla (1995) depicting the utilisation of a common ownership resource.

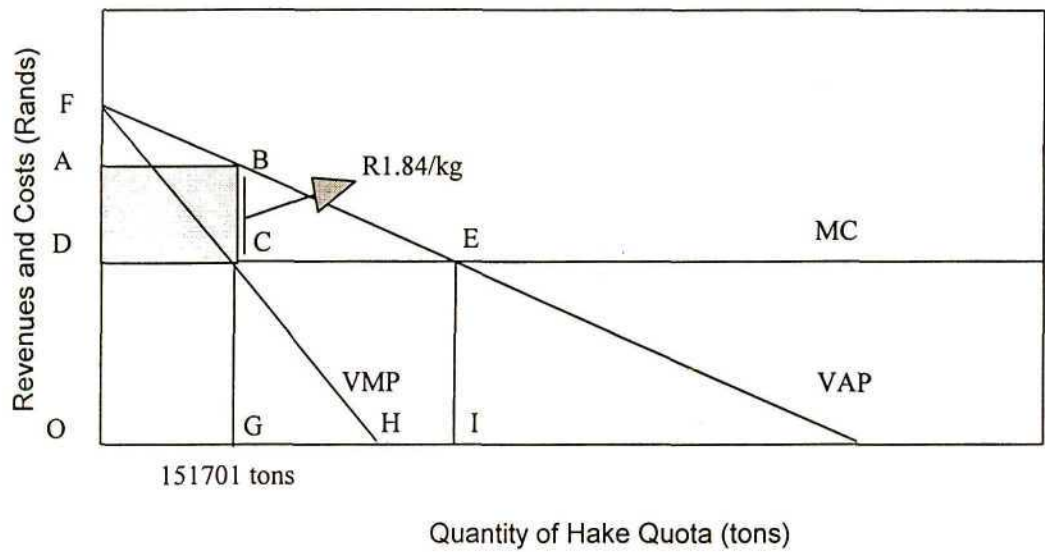


Figure 5.1: Demand for hake quota and quota rents in South Africa, 1997.

The difference between private ownership and common ownership of a resource is demonstrated in Figure 5.1. The optimal level of utilisation from society's point of view (OG), occurs under private ownership where (marginal cost)  $MC = VMP$  (value of marginal product). At this point, an additional unit of cost yields an equivalent unit of revenue. It is not known whether the current allocation of 151701 tons is more or less than the optimum level (OG in Figure 5.1). For illustrative purposes this quota allocation is shown at the optimum level in Figure 5.1, with quota rent being the vertical difference between the VAP and VMP curves. In the absence of control, the open access (or uncontrolled common ownership) result prevails, where  $MC = VAP$  (value of average product), and OI units of the resource are harvested. At this point, no individual



harvester is able to extract any share of rent generated by an efficiently managed fishery, and therefore has no incentive to conserve the resource by reducing harvesting effort. Consequently, an open access fishery will over time gravitate towards point I, which may be beyond the maximum sustainable yield, point H (Doeringer and Terkla, 1995).

Quota rents calculated in Figure 5.1 of R279 million are high when compared to the estimated 1997 landed value of hake of R658 million. Campbell (1990), when dealing with the southern bluefin tuna fishery in Australia, puts forward the idea of over-capitalisation as a possible reason for high quota prices. By virtue of the capital intensive nature of the hake fishery, large quantities of quota are vital to warrant the substantial investment in deep sea trawlers and processing equipment. Companies presently involved in renting quota attach a low opportunity cost to equipment and trawlers purchased under past legislation, when the resource was seen to be growing and access appeared secure. With new developments threatening the viability of past investments, present operators, specifically the five pioneer companies, are having to operate at slim margins, when purchasing quota, in order to survive.

It has been mentioned that the White Paper proposes capturing rents generated by fisheries' resources by instituting a tender system, whereby potential buyers tender for quota on the grounds of economic empowerment and past participation. A free and open tender system would be successful in capturing these rents, but it is not known how government will weight the criteria of economic empowerment against past participation. If a large weight is attached to empowerment, not all the rents may be captured by this tender system. The State, and country as a whole, will in this case, be forfeiting potential income from a resource which has been declared a national asset.

Auctioning quota to the highest bidder on the other hand (as opposed to an untransparent tender system), would ensure that quota was purchased by the highest valued user. This would in-turn ensure that tax revenues accruing to the State are maximised, while at the same time ensuring that international market shares are not compromised by fluctuations in the supply of hake. Equity, an equally important consideration, can then be addressed from an economically stable base. Those who may not have the capital to operate in this capital intensive market, can then also share in the taxable profits derived from a stable industry. Other measures, such as imposing ceilings on the maximum tonnage associated with a particular quota holder, included in the White Paper, can be used to avoid any monopolistic practises distorting the market. Funds raised in strong stable fisheries, such as hake, can then be used to assist more sensitive and vulnerable fisheries (often inshore fisheries), characterised by easier access in both physical and economic terms, and hence often overexploited.

## CHAPTER 6

### POLICY RECOMMENDATIONS

This chapter emphasises the policy implications of the empirical findings, and suggests possible ways in which a new fisheries' policy might meet economic efficiency criteria, while at the same time giving consideration to aspects of equity.

Results of a factor analysis suggest that both quota holders and applicants support a **rapid redistribution** of quota. This may be due to the fact that responses from quota holders are dominated by small to medium size operators, who constitute the majority of the quota register, but only receive a small proportion of the quota (See Table 3.1). Data show this subset, together with applicants, to be unsatisfied with the substantial proportion of quota presently held by a few large companies. Results therefore seem to indicate that policy makers have the support of all existing quota holders to reallocate quota to smaller operators. However, special consideration needs to be given to companies currently holding quota, who voluntarily held back on past catches to allow stocks to recover, and have invested heavily in exploring the viability of new resources for future harvesting. These companies should not be penalised for their efforts, and any policy should take into account any past conservation and investment (Department of Environmental Affairs and Tourism, 1996).

**Longer tenure periods** proposed by the White Paper, are seen as a positive step forward, and are in line with international trends to allocate quota encompassing a broader spectrum of rights. The intentions to have quota revert back to the State over the specified period of the right may



however need further examination. It is felt that the beneficial effects of a longer period of tenure might be eroded by this practice, hence retarding potential investment in the future productivity of the resource.

Applicants' support for a **fixed tonnage** system, as opposed to a variable or **proportional** system of allocation, may reflect that a minimum threshold quota size exists, below which small operators cannot survive the adverse effects of bad years. Larger, established companies may on the other hand be more capable of absorbing these potential losses. Having a dual system of allocating quota, some as a fixed tonnage and some as a proportion of TAC, may be impractical from a management perspective. The plight of those issued with an allocation below an economically viable quota size will therefore need further attention and investigation.

**Self-utilisation** has been a prerequisite for allocation under previous policy, yet this rule has not been stringently enforced in the past. Self-utilisation is however an inefficient management technique, as quota is by definition not transferable. If quota is grandfathered according to the criteria of recipients having utilised the resource in the past, or having the resources required to utilise it in the future, or if quota is auctioned, there seems to be no reason to impose self-utilisation. Transferability should be encouraged as it promotes the efficient utilisation of resources. The practice of issuing token allocations of 'paper' quota, issued on the pretence of empowerment, to individuals who may not have the resources to utilise it, is in fact at the root of concern regarding transferability. Issuing quota to individuals who are unable to utilise it themselves and therefore simply lease their allocation to established businesses, is not seen as an effective means of economic empowerment.

Individuals surveyed and interviewed indicated that the introduction of a culture of **payment** for a resource that has been utilised free of charge for so many years, is going to be a difficult task. Tendering and auctioning quota have been suggested as the chosen methods of extracting rents generated by fisheries' resources. These methods are successful in extracting rents. On the other hand, if an excess of State intervention results in quota transferring to inefficient and ill-equipped users, then these methods will result in the perpetuation of the present system, involving excessive transaction costs, as quota is traded annually between those in possession of quota and those in possession of the assets and knowhow to best utilise it (to the benefit of the economy as a whole). Purchasing quota will however be an expensive process, and policy makers may therefore have to find methods to financially assist new entrants as well as current quota holders. White Paper proposals of issuing quota according to criteria of both economic empowerment and past performance may also have to be clarified, so as to ease the concerns of both existing quota holders, who are worried about losing their historical quota share, and applicants who are concerned about being outbid by established companies already active in the hake fishery.

## CONCLUSIONS

Imposing upper limits on catches, access restriction (license), input restrictions and taxes are unsuccessful at maximising rents generated by fisheries' resources. Leading international fishing nations, including New Zealand, Australia, Iceland, Chile and Norway have therefore pursued an individual transferable quota (ITQ) management regime. Much insight has been gained from the experiences of these countries, most of whom have adopted similar methods of management, involving allocating proportional allotments of quota, free of charge and in perpetuity. These allotments are divisible, fully transferable and inheritable.

Management methods employed by the South African hake fishery presently exhibit many similar characteristics to those used by these leading fishing nations. Present management methods, however, are soon to change according to the White Paper on Marine Fisheries Policy (1997). Many aspects of restructuring, however, have not been well accepted by the fishing industry.

Factor analysis of data collected identified four factors, representing groups of respondents defined as (1) applicants (individuals who's applications for 1997 hake quota were rejected), (2) quota holders (present 1997 hake quota holders), (3) small scale respondents (comprising of both quota holders and applicants), and (4) larger, longer established quota holders. These factor groupings all shared similar opinions on restructuring and offered valuable insight into what present industry members and those attempting to join the industry wished to see from the new fisheries' policy.



Applicants' concerns seemed to centre around issues of competing with established quota holders for quota. For this reason, 85 percent of applicants opposed the auctioning of quota to everyone (both present quota holders and applicants), and 88 percent opposed auctioning quota to new entrants only. Sixty-one percent of applicants sought a rapid (within five years) change to the present quota allocation structure, where a few large companies receive the vast majority of annual quota. It was also found that present small scale quota holders share this view, with 62 percent of quota holders favouring the rapid reallocation of quota. A fixed tonnage system was advocated by applicants, with 83 percent of applicants opting for this system as opposed to a variable, or proportional, system of allocating annual TAC.

Quota holders, on the other hand, seemed more concerned with issues of self-utilisation. All quota holders favoured self-utilisation by new recipients of quota, and 94 percent supported self-utilisation by everyone. All quota holders also opposed the issuing of 'paper' quota. Issues of self-utilisation, however, seem to stem from concerns surrounding new entrants being issued token allocations of quota without the resources to utilise it.

Analysis also revealed a further group of respondents defined as larger, longer established quota holders. Their primary concern seemed to be possible sudden reductions in quota allocation, and proposed methods of payment for quota. These companies have been receiving quota free of charge in the past, and are therefore concerned with the impact that redistribution and payment might have on employment and international competitiveness. Opposition to regulated quota transfer markets was also expressed by this group.

Discriminant analysis showed that the most important discriminating variable, distinguishing between quota holders and applicants, was grandfathering (the issuing of quota according to past allocation). This was followed by issuing quota to new entrants at a predetermined price, and seen to demonstrate the differing opinion on making new entrants pay for quota. Allowing new entrants to on-lease quota to established companies, and the issuing of 'paper' quota, were third and fourth respectively, and provide evidence of the opposing views held by applicants and quota holders on issues of self-utilisation and token allocations.

Hake quota rents estimated at R279 million are high relative to the landed value of hake of about R658 million. These high rents appear symptomatic of the inflated level of past investment in the fishery, necessitating large quota allocations to continue economically viable operations. The high demand for quota from these quarters, together with the current sensitivity of matters surrounding future allocation criteria, may be causing current quota holders to be reluctant to relinquish their rights. Extraction of these rents by auction should be examined. Equity problems could then be addressed at a secondary level, possibly with bureaucratic allocations of quota to poorer communities, with the knowledge that primary allocation is based on sound economic principles.

## SUMMARY

The common ownership problem faced by fisheries' resources leaves policy makers in a position of having to choose a set of management guidelines, that by virtue of the problem, will have to restrict access to a resource which belongs to the country as a whole. The biological control method of implementation of a ceiling on the total allowable catch, can be successful in combatting biological over-exploitation, but is unsuccessful from an economic point of view. Other methods including restricting access (in the form of licenses), input restrictions and taxes have been shown to be ineffective at maximising economic rents generated by fisheries' resources. Individual transferable quotas (ITQs) have been widely heralded as the future in fishery management. South Africa's hake fishery is presently run in a very similar manner to internationally employed ITQ management techniques, but quota lacks fundamental property rights structures, such as security and durability. Exclusivity is currently effective, but is threatened by present initiatives to open the fishery up to those 'previously excluded'.

Hake is the most valuable fisheries' species in South Africa, with an estimated landed value of R658 million in 1997. The fishery is presently managed under an individual quota system, where total allowable catch (TAC) is set annually and divided up according to past performance, without recipients of quota having to pay for it. Five companies presently dominate the South African hake fishery. These five companies (of which two are by far the largest) receive approximately 80 percent of total hake quota allocated, and harvest in excess of 85 percent of the annual hake catch. Fundamental restructuring of the South African hake quota market is however recommended by the White Paper on Marine Fisheries Policy (1997).



A postal survey was conducted of companies allocated with hake quota for the 1997 fishing season (71 in all), and 16 responses were returned. Also surveyed were 275 rejected hake quota applicants, presently attempting to join the industry, of which 25 usable responses were returned. Survey participants were questioned on aspects of current and future policy, methods of restructuring and the present level of activity of the quota rental market.

Analysis of data revealed 83 percent of applicants would prefer a fixed tonnage system of allocation, while 50 percent of quota holders indicated a preference for a proportional system. Applicants' preference for a fixed tonnage system was attributed to the presence of a minimum threshold quota size, of 1423 tons and 468 tons for trawling and longlining operations, respectively, required for an economically viable operation. Applicants also indicated the minimum start-up capital requirement to be R2 070 833 and R625 333 for trawling and longlining operations, respectively.

A common sentiment displayed, was for a longer period of tenure, with only ten percent of all respondents supporting the present one year period of tenure. Preference for a longer period of tenure can be attributed to large investments in resource assessments, harvesting and processing equipment, and marketing infrastructure and networks.

Sixty-two percent of quota holders and 61 percent of applicants support a rapid reallocation of quota (within five years). These figures seem to indicate that both present quota holders and applicants are unhappy with the current domination of the quota market by the five large 'pioneer' companies.

Ninety-four percent of quota holders and 88 percent of applicants support the self-utilisation of quota by everyone, while all quota holders and 84 percent of applicants support self-utilisation by new entrants only. Responses concerning self-utilisation must be seen in the light of present legislation, according to which, quota is grandfathered and not auctioned or tendered.

Auctioning of quota to everyone was opposed by 88 percent of quota holders and 85 percent of applicants, while auctioning to new entrants only was opposed by 69 percent of quota holders and 88 percent of applicants.

Factor analysis of data collected found that distinct differences in attitudes towards restructuring exists amongst respondents. Four factors, representing groups of respondents defined as, (1) applicants, (2) quota holders, (3) small scale respondents (composed of both applicants and quota holders), and (4) larger, longer established quota holders, sharing similar attitudes towards restructuring, were extracted.

Discriminant analysis identified grandfathering as the most important variable discriminating between present quota holders and rejected applicants. Allocating quota to new entrants at a predetermine price, was ranked second, and evidence of opposing views held by applicants and quota holders regarding new entrants paying for quota. Allowing new entrants to on-lease their quota to established quota holders, and the issuing of 'paper' quota, were ranked third and fourth respectively, and their inclusion in the function is indicative of opposing sentiments on self-utilisation and token allocations of quota.

A substantial annual rent of approximately R279 million is generated by the South African hake industry (1997), which is presently harvested free of charge by those issued with quota. It is stated policy of the White Paper to capture these rents, however methods of accomplishing this need to be more clear and comprehensive. Extraction of these rents by the State through auctioning should be considered, while some quota could be allocated to poor communities. The equity problem is however beyond the scope of this study, but recognised to be a very important issue.



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## APPENDICES

### Appendix A: Quota Holder Questionnaire



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### Hake Quota Holder Questionnaire

**To be completed by the principal decision maker with respect to Hake quota received.**

This questionnaire and the proceeding study attempts to highlight factors that need to be considered when choosing between a high level of regulation of the Hake fishery of South Africa, as opposed to a more free market in quota and the transfer thereof. It also attempts to identify a price, at which industry feels quota would trade at, as well as examine the attitude of the industry as a whole towards policies regarding the introduction of new participants into the industry.

This questionnaire consists of 6 pages (this page included). Please complete **All** sections as accurately as possible. Please return the questionnaire, (even if you have not completed all the questions), as soon as possible, (but not later than XX/XX/1997).



**SECTION A: Company Characteristics**

*This section is intended to give a brief overview of the structure of your business operation, purely to put in perspective the nature and size of firm that is being dealt with.*

Name of respondent ? .....  
  
Company name ? .....  
  
Company's residential address and telephone number ? .....

(\* Leave unanswered if you wish to remain anonymous)

How would you categorise your fishing business ? :

Partnership

Close Corporation (CC)

Company

Individual owner

Other (please specify) .....

How many people does the business employ ?

What productive fishing assets does the company own, and what is their estimated current resale value ?

Boat/s

Freezing Equipment

Processing Equipment

Make use of hired assets

Other (please specify asset as well as estimated value) .....

Value

**SECTION B: Level of participation in the Hake industry.**

**Remember :** All questions in the sections below refer to the Hake fishery only !!

*This section is intended to get a brief history of the business operation and its level of participation in the Hake industry.*

For how long has the business been a Hake quota holder ? (years)

What was your quota allocation in 1995 ? (tons)

What tonnage of Hake did the business personally harvest of its 1995 quota ? (tons)

What was your quota allocation in 1996 ? (tons)

What tonnage of Hake did the business personally harvest of its 1996 quota ? (tons)

What is your quota allocation for 1997 ? (tons)

Do you feel that quota share allocation is too unstable each year for preharvest decision making ? (Yes/No)

Do you feel that quota should be allocated as a percentage of Total Allowable Catch (TAC), or as a fixed tonnage ?

\* Please tick the appropriate block.

Percentage

Fixed Tonnage

Do you feel you are fully utilizing the equipment you own, given your present quota allocation ? (Yes/No)

What do you feel is the maximum tonnage you are capable of harvesting at present ? (tons)

### **SECTION C: Level of Non-Market Intervention in the Industry.**

*These questions are asked, to group respondents into one of two groups, namely, those that would support a single channel, controlled quota transfer market, and those that would prefer quota transfers to be handled more by the free and open market.*

Would you prefer ? :

a) Government regulation, where government or allocation board issues quota, and recipients must use the quota themselves in order to qualify for allocation.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

b) Auctioning, where quota is auctioned to everyone, and holders are then permitted to buy and sell quota freely.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

c) Quotas are initially allocated by government or allocation board to recipients according to past allocation and holders are then permitted to buy and sell quota freely.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

\* Please tick the appropriate block.



Would you prefer ? :

a) Government controlled quota transfer market, where transfers would have to take place through relevant control body.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

b) Free to trade quota on open market, without having to deal exclusively through single channel government control body.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

Would you prefer ? :

a) A system whereby the initial purchase price of the quota was less, coupled with a higher annual levy.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

b) A system whereby the initial purchase price of the quota was higher, coupled with a lower annual levy.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

\* Please tick the appropriate block.

#### **SECTION D : Transfers of Quota**

*This section is intended to obtain an idea of the present level of quota transfers within the market, and identify a price that quota would trade at in a free market.*

Did you lease out or rent in any quota in 1997 ? (Yes/No)

Lease out
Rent in

If so, how much (tons), and what did you receive/pay for it ?  
(R/ton)

Tons	R/ton

Who did you lease this quota to/from ? : Government controlling body

Another smaller business

Another larger business


Other (please specify) .....

.....

\* Please tick the appropriate block.

When policy changes and quotas are made more freely tradable, do you intend to sell (all/some) of your present annual quota allocation ?

Sell all
Sell some
No change

\*Please tick the appropriate block.

If you were to sell, how much would you be willing to accept for your quota ? :

If you sold it forever. (R/ton)

If you leased it out for one year only. (R/ton)




Would you be willing to pay for extra quota (over and above your present allocation) ? (Yes/No)

If so, how much would you be willing to pay for extra quota ?  
If you bought it forever. (R/ton)

If you rent it for one year only. (R/ton)

If the quota price had to increase by 25%, 50%, 75% and 100%, from the price you quoted above (for permanent ownership of extra quota), how much less quota would you buy at these respective prices ?

25% increase in price	50% increase in price	75% increase in price	100% increase in price
.....% less quota	.....% less quota	.....% less quota	.....% less quota

Would you support the auctioning of quota ? (Yes/No) (Lots of quota could be defined for 1 year, 5 years, or what ever period would suite the buyer.)

If you support the auctioning system, what time period would you preferably invest in ? (Please tick the appropriate block)

1 Year
2-5 Years
6-10 Years
11-30 Years
Perpetuity

## SECTION E: Introduction of New Participants

*A requirement of the new fisheries policy was to stipulate how it intended to incorporate new entrants into the fishery. It is the intention of this section to gauge your view on how this should be accomplished.*

How do you feel quota should be allocated to new applicants ?

a) Allocate quota to new entrants by means of allocation board, free of charge.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

b) Allocate quota to new entrants by means of allocation board at a predetermined price.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

c) Auction the quota to the highest bidder.

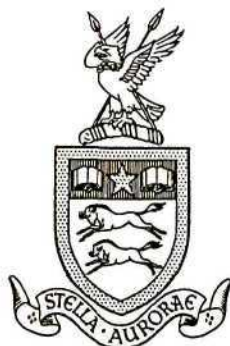
Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

\* Please tick the appropriate block.



## Appendix B: Applicant Questionnaire





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## Hake Quota Applicant Questionnaire

To be completed by the principal decision maker with respect to the Hake quota applied for.

This questionnaire and the proceeding study attempts to highlight factors that need to be considered when choosing between a high level of regulation of the **Hake** fishery of South Africa, as opposed to a more free market in quota and the transfer thereof. It also attempts to identify a price, at which industry feels quota would trade at, as well as examine the attitude of the industry as a whole towards policies regarding the introduction of new participants into the industry.

This questionnaire consists of 6 pages (this page included). Please complete **All** sections as accurately as possible. Please return the questionnaire, (even if you have not completed all the questions), as soon as possible, (but not later than XX/XX/1997).

**SECTION A: Company Characteristics**

*This section is intended to give a brief overview of the intended structure of your business operation, purely to put in perspective the nature and size of firm that is proposed.*

Name of respondent ? .....

Company's proposed name ? .....

Company's residential address, telephone & fax number ? .....  
.....  
.....

How would you categorise your proposed fishing business ? :

Partnership	
Close Corporation (CC)	
Company	
Individual owner	
Other (please specify) .....	

\* Please tick the appropriate block.

How many people does the business intend employing ? 

--

Are you presently involved in the fishing industry (Yes/No), and if so how ? 

--

Present involvement ? .....  
.....

What productive fishing assets does the proposed company <u>already own</u> , and what is their estimated current resale value ?	Value
Boat/s	
Freezing Equipment	
Processing Equipment	
Make use of hired assets	
Other (please specify asset as well as estimated value) .....	
.....	

What productive fishing assets does the proposed company <u>intend investing in</u> , and what is their estimated value ?	Value
Boat/s	
Freezing Equipment	
Processing Equipment	
Make use of hired assets	

Other (please specify asset .....  
as well as estimated value) .....

**\* (All questions that follow are asked with reference to the Hake industry only.)**

Do you feel that quota should be allocated as a percentage of Total Allowable Catch (TAC), or as a fixed tonnage ? * Please tick the appropriate block.	Percentage
	Fixed Tonnage

Do you intend ?:	Yes/No	Tonnage
Harvesting		
Processing		
Marketing		
Other (please specify).....		

\* Please tick the appropriate block.

What do you feel is the maximum tonnage you will be capable of processing? (tons)

What do you feel is the maximum tonnage you will be capable of marketing? (tons)

What do you feel is the maximum tonnage you will be capable of harvesting? (tons)

What fishing method do you intend using to harvest your quota allocation ? (* Please tick the appropriate block)	Handline
	Longlining
	Trawling

Other (please specify).....

If you cannot harvest your entire quota, who do you intend getting to harvest the remainder of your quota for you ?

Undecided

Name of Company.....

What do you feel is the minimum quota size that would support an economically viable trawling/longlining operation? (tons)	Trawling	Longlining

What do you feel is the minimum start-up capital required for an economically viable trawling/longlining operation ? (rands)	Trawling	Longlining



**SECTION B: Level of Non-Market Intervention in the Industry.**

*These questions are asked, to group respondents into one of two groups, namely, those that would support a single channel, controlled quota transfer market, and those that would prefer quota transfers to be handled more by the free and open market.*

Would you prefer ? :

a) Government regulation, where government or allocation board issued quota, and recipients must use the quota themselves in order to qualify for allocation.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

b) Auctioning, where quotas are auctioned to everyone, and holders are then permitted to buy and sell quota freely.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

c) Quotas are initially allocated by government or allocation board to recipients according to past allocation and holders are then permitted to buy and sell quota freely.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

\* Please tick the appropriate block.

Would you prefer ? :

a) Government controlled quota transfer market, where transfers would have to take place through relevant control body.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

b) Free to trade quota on open market, without having to deal exclusively through single channel government control body.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

Would you prefer ? :

a) A system whereby the initial purchase price of the quota was less, coupled with a higher annual levy.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

b) A system whereby the initial purchase price of the quota was higher, coupled with a lower annual levy.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

\* Please tick the appropriate block.

**SECTION C : Transfers of Quota**

*This section is intended to obtain an idea of the present level of quota transfers within the market, and identify a price that quota would trade at in a free market.*

If you had to rent in quota , or buy quota forever, what would you be willing to pay for it ?

If you bought it forever ? (R/kg)

If you rented it for one year only ? (R/kg)

Including By-catch	Excluding By-catch

If you were to sell your quota allocation, how much would you be willing to accept for it ? :

If you sold it forever. (R/kg)

If you leased it out for one year only. (R/kg)

Including By-catch	Excluding By-catch

Would you support the auctioning of quota ? (Yes/No) (Bundles of quota could be defined for 1 year, 5 years, or what ever period would suite the buyer.)

If an auctioning system were introduced, what time period would you preferably invest in ? (\* Please tick the appropriate block)

1 Year
2-5 Years
6-10 Years
11-30 Years
Perpetuity

#### **SECTION D: Introduction of New Participants**

*A requirement of the new fisheries policy was to stipulate how it intended to incorporate new entrants into the fishery. It is the intention of this section to gauge your view on how this should be accomplished.*

How do you feel quota should be allocated to new applicants ?

a) Allocate quota to new entrants by means of allocation board, free of charge.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

b) Allocate quota to new entrants by means of allocation board at a predetermined price.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

c) Auction the quota to the highest bidder.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

\* Please tick the appropriate block.

What do you feel is the best way for new applicants to be incorporated into the industry ?

A 'once-off' percentage decrease in allocation to existing quota holders.

A percentage decrease in allocation to existing quota holders phased in over a 1 to 5 year period.

A percentage decrease in allocation to existing quota holders phased in over a 6 to 10 year period.

Wait for the TAC to increase, and then allocate the increase to new participants

Other (please specify)

.....  
.....

\* Please tick the appropriate block.



Which of the following methods do you most support ?

a) Allocate quota to new entrants, and allow them to lease it to other companies.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

b) Allocate quota to new entrants, and only allow them to lease it back to a relevant controlling body.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

c) Allocate quota to new entrants, but they have to use the quota themselves to qualify for allocation.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

\* Please tick the appropriate block.

Do you support the concept of a 'Paper Quota'\* ? (\* ie., quota not utilized directly by holder.) (Yes/No)

When new applicants receive quota, how long should they be allowed before they are 'up-and-running' and using their quota share themselves ?  
(\* Please tick the appropriate block)

1 Year
2 - 5 Years
6 - 10 Years

If quotas were bought or issued and made transferable, do you feel there should be a 'no-resale'\* period, and if so, how long ? (years)

Yes/No	Period
<input type="text"/>	<input type="text"/>

\* 'no-resale' period refers to a certain period of time where the quota may not be resold to make a quick profit by exiting the fishery.

Would you like to see the results of this study ? (Yes/No)



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**THANK YOU FOR YOUR PARTICIPATION IN THIS STUDY.**

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