



COMPLIANCE BEHAVIOUR IN STATE-RUN FISHERIES: SITUATING LAKE CHIVERO IN A POLICY PERSPECTIVE

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ABSTRACT

Parks and wildlife facilities are intended to contribute people's wellbeing socially and economically. This aim puts parks and wildlife management in policy. Appropriate management of parks and wildlife for wider social wellbeing is essential. This paper brings out the issues in compliance behaviour of fishers in Zimbabwe's state-run lakes. The underlying aim of the study is to create policy options that sustain both the fish resources and the wellbeing of the fishers. Zimbabwe's Parks and Wild Life Management Authority (ZPWMA) administers all state-run lakes in Zimbabwe in order to prevent their over-exploitation. Despite its strict management regulations, the following rather disturbing developments continue to be observed:

- a) An increase in disregard for the regulations among licensed fishers and an influx of unregistered fishers (poachers).
- b) A growing incapacity on the part of ZPWMA to contain the worsening non-compliance with management regulations among fishers.
- c) An increase in the number of illegal fishers entering the fishery.
- d) An increase in the amount of fish being sold illegally on open markets in Harare and neighbouring towns.

The growing non-compliance with regulations could be a result of many factors. Firstly, the worsening economic problems, the rising unemployment as well as the ever-spiralling prices of beef mean that some people are finding fish to be the next cheaper substitute. Secondly, the rather narrow and state centrist approach to fisheries management little considers the practical concerns of fishers giving them no incentive to comply with the regulations. Thirdly, because of the above, the regulations are low in legitimacy, making them less self-enforcing and costly to enforce. At a policy level, the study attempts to find ways of making the existing fisheries management structures, policies and practices at the fishery command more respect and acceptance among fisheries, whilst creating a conducive environment for the fishers to enhance their wellbeing through fishing. The following main recommendations were made:

- a) Greater attention be paid to the legitimacy aspects of the regulatory institutions as well as the regulations;
- b) The interests of and concerns of the fishers be more fully incorporated into the management regulations to enhance their acceptance by fishers; and

c) *The job conditions of ZPWMA employees should be improved to curb corruption and to improve how they interact with fishers.*

Keywords: Compliance behaviour, State-run fisheries, Institutions, Policy.

Contribution/ Originality

This article is a result of a unique study on compliance behaviour of fishers at Lake Chivero in Zimbabwe as a policy issue. The study contributes to the limited empirical knowledge and literature on creating policy options that sustain both the fish resources and the wellbeing of the fishers in state-run fisheries.

1. INTRODUCTION

The study focused on institutions, that is, the formal and informal rules and regulations that govern fish resource utilisation at Lake Chivero as well as the structures and processes that make and enforce these regulations. This focus calls for an analysis of water resources policy and governance. The underlying aim of the study is to create policy options that sustain both the fish resources and the wellbeing of the fishers. Fisheries management involves control, monitoring and surveillance. [Hersoug and Paulsen \(2006\)](#) define monitoring in the context of fishing as the collection, measurement and analysis of data on the fishing activity. Control is the specification of the terms and conditions under which fish can be harvested while surveillance is the checking and supervision of the fishing activity to ensure that the national legislation and terms, conditions of access and management measures are observed. Of the three, the study was concerned with surveillance. This constitutes the regulations which in the case of Lake Chivero include licensed entry and entry restrictions to certain designated areas of the lake such as breeding areas. Also included are gear restrictions such as minimum mesh sizes or limiting the number of netting (fishing effort) one is authorised to use. Basing on these management measures, the factors that give rise to non-compliance with the existing regulations at Lake Chivero were analysed in this study. The state enforces fisheries regulations to control the excess fishing effort and to prevent over-fishing. Effective control of the fisheries is based on successful enforcement of the imposed regulations. In order to be effective, governments try to increase the probability of detecting and sanctioning of violations through investing more time and resources in patrolling the fishery. To deter violations, governments also increase the penalties for violating the regulations. In spite of all the above efforts, increases in non-compliance behaviour continue to be registered in fisheries in Zimbabwe. There continues to be massive fish poaching at Lake Chivero in particular, showing that efforts by the state are not being effective. Such massive poaching shows that there could be inadequacies in the existing regulatory arrangements. The study sought to address a number of questions which include: what are the inadequacies in the existing regulatory institutions at Lake Chivero and other state-run fisheries in Zimbabwe? What social and psychological factors were not fully considered in coming up with the regulations? Was the rule making process democratic and participatory? Lastly, what modifications and improvements could be made to the present regulatory system in order to induce or secure greater compliance with the management regulations? These questions lead to a critical analysis of the inadequacies in the existing management institutions, that is,

the bodies that institute and enforce the regulations as well as the processes and procedures by which they enact and enforce those regulations. The ways in which the institutions structure how fishers interact with the fish resource, particularly with respect to access, use and management becomes apparent. Due to budgetary constraints, ZPWMA is increasingly finding it difficult to provide both human and material resources to effectively contain the non-compliance problem at Lake Chivero. Simultaneously, as a result of the tough economic situation in the country, fishers and poachers are finding it more worthwhile to use more innovative ways of evading the existing management regulations in the fishery. This inevitably places the fish resource at risk of being harvested beyond its replenishment level. Indications are that the existing institutional arrangements are inadequate and not addressing the root causes of non-compliance with the fisheries management regulations at the lake. It therefore need to be established why fishers are finding it more worthwhile to violate the regulations and not just continue to treat the symptoms of the non-compliance problem. The study therefore examined the extent to which the current fisheries management practices at Lake Chivero are consistent with the fishers' social and psychological needs with the view of recommending how their perceived legitimacy and acceptability could be enhanced.

1.1 Background and Context of the Study

Lake Chivero was impounded in 1952. The use of gillnets for commercial fishing activities started in 1956. The lake is one of the four Manyame lakes built primarily to provide water to Harare, Chitungwiza and Norton. It has a total of twenty-seven (27) known and recorded fish species of which most were present in the river system before its impoundment. A number of other species were introduced after independence in 1980 ([Government of Zimbabwe, 1982](#)). The lake is highly entropic due to a long history of sewage effluent addition and this has resulted in increased fish production over the years. The high enrichment levels in the water body places some fish species at risk. Over the last decade there were reports of massive fish deaths due to excessive eutrophication. Water weeds, especially the water hyacinth are other major threats to the fishery's sustainability. From just one fishing company operating in the first two decades, the lake now boasts of thirteen indigenously-owned fishing cooperatives. The commercial fishing industry at Lake Chivero employs two types of gear, namely gillnets and seine nets. However, gillnets are the pre-dominant gear used. The Parks and Wild Life Management Act ([Republic of Zimbabwe Parks and Wildlife Management Act, 1996](#)) is the principal Act governing the development, control and management of fisheries in Zimbabwe. Part XIV of the Act specifically provides for fish conservation. Final authority over fishery resources in Zimbabwe is vested in the Minister of Environment, Water and Climate.

ZPWMA is empowered by the Act to regulate, control and prohibit fishing in the controlled waters. It employs a number of management measures. These include:

- control of fishing in which fishing is only allowed in specified waters and done after the issuance of a permit by ZPWMA;
- authorisation or prohibition of destructive fishing methods such as the use of explosives, chemicals, poison, etcetera;

- control of the introduction into the waters of fish and aquatic plants and importation of live fish and fish ova;
- control of the business of catching and selling fish without a permit;
- authorisation of fishing gear and regulation of the type of fishing method; and
- possession of fish caught in contravention of the Act is an offence punishable by a fine.

Of late, there have been significant increases in the violation of all the above regulations thereby putting the fish resources at risk of over-exploitation. Two management issues have emerged to be of great concern in the management of the fishery (Nyikahadzoi, 1998). The first is the lack of institutional harmonisation. For instance, the fishery's management lies under ZPWMA which sadly is not represented in the municipal water supply and watershed management system. Furthermore, ZPWMA has no facilities for water quality management. This responsibility lies with the Ministry of Health and Child Care. Secondly, there is lack of stakeholder participation. There are no clearly established consultative arrangements among land users of the watershed. This includes commercial and resettled farmers around the lake, city 'fathers and mothers', tourist operators, industrialists and so forth. Consequently, there exist no collectively muted and implemented plan for managing the watershed and the fish resource.

Campbell in Christofferson *et al.* (2006) point out that institutions that structure the way in which fishers interact with the fish resource may include the rule making bodies, the laws and regulations, agencies authorised to monitor compliance as well as the agencies authorised to prosecute, judge and sanction infractors. Sutinen *et al.* (2000) suggest that non-compliance with regulations is the principle cause of failure of most fishery management and conservation programmes. The argument is that most failure often results from fisheries authorities perceiving non-compliance with regulations equivalent to inadequate enforcement. Consequently, they frequently respond to non-compliance by intensifying monitoring and enforcement efforts. Monitoring and enforcement aim at manipulating the economic gains that accrue from violating a given regulation. According to Becker (1968), this is premised on the belief that under economic factors, the decision on compliance versus non-compliance behaviour is based on the calculation of the economic gain obtained from by-passing a regulation compared to the likelihood of detection and the severity of the penalty the violation would attract.

Viswanathan (2004) terms economic factors deterrence factors, and considers them as serving to either increase or decrease the monetary cost or benefits of non-compliance. Enforcement is only but one of the larger management picture as conceptualised by Sutinen *et al.* (2000). The rule-making bodies, the actual laws and regulations, the players (which include the fishers) in the entire fishing industry, the agencies authorised to prosecute, judge and sanction violators, constitute this total management picture. One would note that only focusing on monitoring and enforcement is tantamount to only considering the last two components of total management. It will therefore be an incomplete conceptualisation of compliance behaviour in fisheries. Moreover, such an analysis only considers economic determinants of compliance while ignoring the interests and concerns of other equally important players, and that is the fishers. Nielsen (2003) contends that psychological and social factors also shape the context in which the fishers make compliance decisions. Psychological factors encompass the degree to which the fisher feels morally obliged to comply with a given regulation.

Kuperan (2002) and Susilowati (2008) concur that this moral obligation to comply with management regulations can be so effective in enlisting compliance behaviour to the extent that there may be very little need for monitoring and enforcement.

The social environment influences the last but equally important of the factors that mediate a fisher's compliance decision making context. Akers (2005) identifies the important social variables as one's peers' opinions about the individual's behaviour vis-a-vis the regulations as well as the extent of the social influence one is subjected to. For Coles (2002), an acceptable reputation as the key variable under social factors should be built and maintained. On the other hand, how others in the fishing community respond to the regulations influences how the individual would respond too. Viswanathan (2004) and Susilowati (2008) share the argument that whether the individual will comply with the regulations or not, is moderated by the extent to which she or he perceives the regulatory institutions to be legitimate. From this overview, it can be discerned that economic, psychological and social factors all play a part in influencing a fisher's decision to comply with or infract any given management regulation. Therefore a holistic approach to fisheries management and one that enhances compliance behaviour would be one that fully considers and incorporates all the three variables. Nyikahadzo (1998) reports that until recently, state-sponsored research in fisheries focused exclusively on biological studies of fish. To date, no comprehensive research has yet been conducted on the effects of psychological and social factors on the fisher's compliance at Lake Chivero in particular. Consequently, in trying to discourage non-compliance with management regulations, fisheries authorities have tended to focus only on the economic factors by manipulating the detection rates and penalty levels. The increases in violations of the regulations shows that such attempts are not effective and other more holistic options have to be sought.

Non-compliance with any existing regulations can be a serious problem and undermines the effectiveness of fisheries management. Yahaya in Kuperan (2002) acknowledges that securing compliance with regulations is often much more difficult than is often thought because frequently the regulations are not self-enforcing. The more the regulations are perceived to be legitimate and hence acceptable by fishers, the more they are likely to comply with them. Examining the ways to make enforcement more cost-effective and securing compliance with the regulations would therefore be a worthwhile exercise for any fisheries management authority. One way of achieving this objective would be to fully consider and incorporate all the psychological and social factors at play at Lake Chivero.

Nyikahadzo (1998) explains that the major purpose of fishery management is to control the fishing effort in a manner that will continue to yield the net benefits for the community without undue strain on the fish resource. Implicit in this goal is the need to manage the fish resource sustainably. According to Hachileka (2005), three components constitute sustainable management. These are ecological sustainability, economic sustainability and social sustainability. The study was concerned mainly with the third type of sustainability although the other two are subsumed. A socially sustainable resource management regime is one that incorporates the needs and interests of the user groups. Nielsen (2003) suggests that the perceived legitimacy of a management regime is a critical

determinant of compliance with the rules. The more directly involved the fishers are in installing and enforcing the regulation, the more the regulations will be perceived as legitimate.

1.2. Objectives of the Study

The study sought, as its overall objective to create policy options that sustain both the fish resources and the wellbeing of the fishers at Lake Chivero Fishery. Such identification would lead to the specific objectives of the study. These are to:

- assess the effectiveness of the existing fisheries management regulations in securing compliance behaviour
- ascertain the extent to which the fisheries perceive the existing regulatory institutions to be legitimate and hence acceptable
- investigate the degree to which the non-compliance with management regulations is caused by the inadequacies of the existing regulatory institutions
- propose strategies for improving compliance at Lake Chivero Fishery.

2. METHODOLOGY

2.1. Data Requirements and Methods

In order to attain a comprehensive understanding of compliance behaviour of the fishers at Lake Chivero, it was necessary to collect data on the background of Lake Chivero Fishery and regulatory frameworks. Each of these components demanded that the researchers apply various data collection techniques. The data requirements and collection techniques used on each component are explained below.

a) The Background of Lake Chivero Fishery

i) Data Requirements

In order to examine the background to the fishery, the researchers collected the following sets of data:

- History of Lake Chivero;
- Background to the fishing activities; and
- The management rules.

ii) Data Collection Techniques

• Desk Research

Fieldwork was supplemented with longitudinal data available from Lake Chivero Research Station and ZPWMA Head office. This data included catch and effort statistics of the fishery. A log book showing the number of poachers arrested as well as their illegal loot and gear confiscated was examined.

- **Oral History**

Key informants such as ZPWMA and fishing cooperative personnel were interviewed for their knowledge of the background of the Lake and the fishing activities over the years. Focus was also on what they perceived to be the strengths and weaknesses of the existing regulatory institutions.

- **Informal Interviews**

Informal interviews were conducted with some principal respondents, that is, ZPWMA staff, fishing cooperatives and individual fishers. No formerly structured questionnaire was prepared for interviews. However, a checklist of questions was drawn up to elicit informant views on the following broad topics:

- The type of fishing gear (legal and illegal) in use;
- The fishers' experiences with the enforcement agents;
- The extent to which fishers perceive the regulatory institutions to be just, fair and consistent with their interests and with fish resource conservation; and
- The extent to which fishers perceive management regulations to be consistently enforced on all fishers.

- **Focus Group Discussions (FGDs)**

FGDs were conducted with co-operative committees and members of four (4) of the thirteen (13) fishing co-operatives operating at lake Chivero. They were also held with a team of ZPWMA rangers on duty at Lake's Marimba Ticketing Office as well as Cove Administrative Office. Both discussions lasted for about an hour each and focused on the following issues:

- The fishers' perceptions on the existing management regulations;
- Factors that compel or encourage fishers to violate the management regulations and how they do so; and
- The extent to which fishers feel their views and interests were incorporated into the regulations.

b) Regulatory Institutions

i) Data Requirements

To assess the perceived legitimacy and consequently the effectiveness of the existing regulatory institutions at Lake Chivero, the following sets of data were collected from both ZPWMA and fishing co-operatives management and staff.

a) ZPWMA Management and Staff

- The extent to which they felt the Zimbabwe Republic Police (ZRP) should be involved in law enforcement; and
- The adequacy and appropriateness of the resources they had at their disposal to enforce the regulations.

b) The Fishers

- The extent to which they felt the existing regulatory measures were appropriate in conserving fish as a resource;
- How effectively they felt the regulatory institutions promoted their wellbeing;
- The extent to which they perceived the regulatory institutions to be fair, just and acceptable;
- Their experiences with the law enforcement agents, that is, consistency of enforcement, corrupt tendencies, etcetera; and
- The overall effectiveness of the regulatory institutions.

II) Sampling Procedures, Data Collection Techniques and Tools

Five tools were employed to gather data for this study and these were:

- a) Questionnaire for fishers;
- b) Questionnaire for ZPWMA rangers;
- c) Focus Group Discussions/informal interviews for fishers; and
- d) Review of relevant documentation by ZPWMA.

Due to the nature of their duties, rangers and fishers were not always easy to locate. ZPWMA rangers work on a day-night shift basis. Also, during the day, fishers would be either out on the lake fishing or too tired to attend to the researchers after a fishing trip each time the researchers visited the research site. For these reasons, the convenience sampling technique was adopted for both groups. With this technique, the investigators administered the questionnaire on fishers or rangers as long as she or he met the previously adopted criteria up to a previously determined quota. The same sampling technique was used for the FGDs for the same reasons.

• **Questionnaire for ZPWMA Members of Staff**

To complement the interview schedule for ZPWMA members of staff, a structured questionnaire was prepared. The questionnaire sought to solicit the members' views on how serious they felt the level of violations was and what prompted the violations. Information was sought on what members felt were the weaknesses in the regulatory institutions and how these could be leaving room to the infractions. The same questionnaire also sought to establish how well the members were coping with the problem of non-compliance as well as the improvement they wanted to see instituted in the institution. The last section of the questionnaire sought to assess the rangers' likelihood of acting in complicity with infractions as well as their general level with their jobs.

• **Questionnaire For Fishery Management Committees and Members**

The questionnaire was divided into sections A, B, C, D and E along the same lines as the interview guide for fishery operators and their employees. Section A focused on the members fishing background as well as their household background. Section B solicited for fishers' views about the existing fishing rules and regulations at the lake. In section C, the fishers' views on how to solve cases of infraction were sought with the view to establish each individual respondent's likelihood of violating the regulations. Section D sought to evaluate the fishers' experiences with the law enforcement and

authorities (ZPWMA) at the lake in the preceding six (6) months. The researchers were attempting to assess the extent to which the fishers perceived the enforcement regime to be effective. Section E specifically required fishers to assess the extent to which they perceived the existing institutions to be efficient and effective.

2.2. Data Analysis Techniques

The data analysis techniques used in the study are explained below.

2.2.1. Data Verification and Validation

To confirm the internal consistency of the data, data cleaning commenced with verification and validation of the data collected. This was done to ensure that the data would fit with the designated codification system. This stage involved the researchers going through each of the two sets of completed interview schedules and two sets of questionnaires.

2.2.2. Codification and Capture

A system of codification was developed so as to accommodate all responses as much as possible. Data were then input manually on a question-by-question and section-by-section basis. Use was made of the tallies with totals and percentages being computed for each response category. Where appropriate, averages and relative frequencies were also computed. At this stage, further cleaning of data was conducted wherever it was deemed appropriate.

3. DATA PRESENTATION AND DISCUSSION

To situate the reader into the context of the research question, data were aggregated into percentages, fractions and ratios. Data were presented in quantitative (for example percentages) and qualitative terms (explanation and discussion on trends that were observed to be emerging in the data) to facilitate the drawing of inferences.

3.1. The Fishers' Experiences with Regulatory Institutions at Lake Chivero

The experience with the authorities and the way one has been treated (procedural fairness) is an important factor for maintaining and, respectively undermining the fishers' perceived legitimacy of the management regulations (Nielsen, 2003). The fishers' perceptions are presented under the following sub-headings.

3.1.1. The Extent to Which Fishers Perceive the Regulations as Promoting Conservation

87% of the respondents reported that they completely agreed with the view that the regulations promoted conservation while 13% reported that they just agreed with it. None of the respondents indicated that they were undecided, disagreed or completely disagreed with the claim that the management rules indeed promoted conservation. How effectively fishers feel the regulations protect the resource constitutes one of the four elements identified by Kuperan (2002) of an authority's characteristics that determine the perceived legitimacy of a management institution. This relates to the

effectiveness of a management system's outcomes, that is, the extent to which conservation is realised. When fishers feel the enforcement of the regulations will generate benefits for them, they tend to comply with the regulations more. Viswanathan (2004) calls them outcome effects of the regulatory institutions while Sutinen *et al.* (2000) observe that fishers tend to feel more obligated to management measures that are credible in terms of conserving the stocks and protecting the future economic health of the fisheries.

3.1.2. The Perceived Equity (Fairness and Justice) of the Regulations

It was generally recognised in legitimacy literature that the fishers' perceived legitimacy of the existing management regulations is an important determinant of their willingness to comply with them Sutinen *et al.* (2000). 84.2% of the respondents indicated that they perceived the regulations to be fair and 15.8% of the respondents felt that they were not. One of the reasons respondents gave for thinking that the regulations were fair and just was that they felt that the regulations promoted the sustainability of both the fish resource and the fishers' wellbeing. Those who felt the regulations were not fair and just raised the issue of corrupt practices by some ZPWMA rangers. This issue brought into question the aspect of procedural fairness espoused by Kuperan (2002). Compliance behaviour of fishers declines due to perceived procedural and distributive inequalities and injustices.

3.1.3. Promotion of the Fishers' Wellbeing

The extent to which fishers perceive the management regulations to promote their wellbeing is another key factor in the fishers' decision to comply or not to comply with management regulations. It is linked to how effectively the regulations are perceived to promote conservation by fishers. 10% of the respondents were undecided, 12% agreed and 78% completely agreed. To be perceived as legitimate, the regulatory authority has to be seen to be producing positive outcomes for both the fishers and the fish resource. Such outcomes would need to be consistent with fishers' livelihood needs. Even in the absence of external enforcement, inducement and social pressure, fishers may conclude that it is in their best interest to comply. However, this may not occur if the individual feels or knows that his or her peers are violating the regulations.

3.2. Management Regulations and Conflict between Fishers

All the respondents expressed agreement that management regulations are essential in management of conflicts among fishers. 78% of the respondents strongly agreeing and 22% agreed. These findings were consistent with those on the view that it is essential that ZPWMA should impose the regulations. There was consensus that conflict among players in a fishery works to the detriment of the conservation goals and lowers the perceived legitimacy of the regulations. Serious conflicts are not uncommon between fishers at the Lake Chivero especially over fishing boundaries and allegations of catch and gear thefts. Hersoug and Paulsen (2006) argue that where there are antagonistic divisions, each fisher will try to achieve his or her particular objective even if it is at the expense of the other fishers.

3.3. The Extent to Which the Fishers perceive their Views to be incorporated into the Regulations

The respondents' views on the degree to which they thought the rule-making process was participative were elicited under this section. 89% of the respondents said that they were not consulted while two respondents 11% said they did not know if there had been any consultations. The latter who said they were not sure have only been fishing for less than a year which might indicate they have not been in the business for long enough to know.

The majority of the respondents (56%) said that they disagreed while 6% completely disagreed. This gives a total of 62% of the respondents who expressed disagreement. A total of 22% said that they just agreed, 6% strongly agreed and 10% said that they were not sure. 62% felt that the rule-making process was not participative. Nielsen (2003) views the incorporation of resource users' views, and better still, their participation in the management process, as a very important aspect of the perceived procedural fairness of the management process. Fishers tend to feel more obligated to regulations that they had a role in formulating than regulations that appear dictated by a distant authority (Sutinen *et al.*, 2000). Having user participation in the management decision-making process increases the chances of the regulations being adjusted to the fishers' practical concerns. For this reason, user participation can be expected to promote the legitimacy of and compliance with the regulations. The results show that the rule-making process was not as participative as would normally be expected.

3.4. The Perceived Consistency of the Enforcement of Regulations at Lake Chivero

Jentof in Hersoug and Paulsen (2006) sees consistent enforcement as procedural fairness wherein the way in which regulatory procedures are consistently applied across all infractors with no selective enforcement is a key determinant to their perceived legitimacy. Inconsistency in application of regulations undermines the credibility or legitimacy of the management authority in the eyes of the fishers. Yahaya in Kuperan (2002) underscores the need for an authority to be imbued with both distributive and procedural justice. Selective or inconsistent enforcement of regulations means that the benefits and sacrifices of an enforcement programme are not shared fairly among all the affected parties. Secondly, it also means that the authority does not fairly treat all fishers and their concerns. Therefore, their natural response would be not to comply with the regulations. 21.1% of the respondents felt that, by and large, the regulations were generally consistently applied across all fishers especially with respect to the use of life jackets. The majority, 78.9% felt that because of corrupt tendencies among the game rangers, there was selective enforcement of the regulations. As a result of the above, most of the respondents generally felt that not all those who violated the regulations were brought to book as they used bribes to buy their freedom.

3.5. The Match between Penalties for Infraacting Regulations and the Offences

The findings indicate that for most of the respondents, the definition of a penalty was only limited to monetary fines. This could possibly explain why the majority of them felt the penalties imposed by ZPWMA did not constitute much of a deterrent for non-compliant behaviour. In interviews, 10% of the respondents felt the penalties fitted the offences. 80% felt penalties were too low and 10% were not

sure. 100% of the respondents who completed the questionnaires felt the penalties did not fit the offences. However, in a separate question on problems the regulations create for them, 97% of the fishers voiced concern over boat and catch seizures which they said were too severe as in some cases they paralysed their operations for days or weeks as they tried to raise the fines required or bribes for the release of the boats and nets. Focus group discussions also revealed that sometimes boats and nets were stolen by thieves who then used them to fish illegally leading to seizures and arrests by management authorities. It was in such cases that the fishers generally felt that ZPWMA needed to expedite the return of the boats and nets to their rightful owners so as not to inconvenience them unnecessarily.

An increase in the level of penalties together with the probability of detection, the level of enforcement inputs, the fishers level of moral development and the level of legitimacy have a negative impact on the violation behaviour of a fisher (Viswanathan, 2004). The penalty constitutes part of the cost of a violation. It is known that individuals will refrain from violations only when the monetary value of the penalty multiplied by the probability of being prosecuted exceeds the illegal gain from violating (Hersoug and Paulsen, 2006). Penalties could take the form of monetary fines, catch and boat seizures, fishing permit withdrawal and jail terms.

3.6. Problems Created by Management Regulations for Fishers

One common concern raised by management across all the fishing co-operatives sampled for this study was that, because of inadequate enforcement of rules, there were too many boats, net and catch thefts by fish poachers and other fishers. Another complaint raised by the majority (78%) of the fishers was that the fishing time, particularly in the case of seine netting, was too limited. Seine netting is supposed to start at 10 O'clock in the morning during the week days and is not allowed during weekends. Fishers complained that 10 O'clock was too late for them to manage two fishing trips in a day. They also requested to be allowed half a day of seine netting on Saturdays. They generally felt that the present arrangement gave them limited time for fishing and afforded the poachers more instead. In short, they felt the regulations inconvenienced them in this respect.

All fishers are supposed to have cleared from the lake by 4 pm. 57% of them felt that, without adequate patrolling after fishers have cleared the lake, this gave poachers ample time to steal. 43% of the respondents felt that the lake was getting too congested because the areas designated for breeding were too large but this was disputed by ZPWMA officials at the research station.

3.7. Chances that the Fishers Could Infract the Regulations

Respondents were requested to carefully consider a given case study and to then use their evaluative judgments to respond to a set of questions based on it. The case presented was one of a fisherman with a large number of dependents to support. He does not have any other skills and cannot get any other kind of work. To supplement his earnings he approaches the management authorities for permission to use fishing gear that they do not allow but the request is rejected. He cannot get help from relatives or friends. He becomes desperate and starts using the gear anyway thus violating the standing regulations.

Kuperan (2002) suggests that, to enhance the perceived legitimacy of the regulatory institutions, enforcement authorities should target chronic and flagrant violators punishing them accordingly, while tolerating to some degree minor violations by fishers who normally comply. Implicit in this argument is that, in enforcing regulations across all fishers in a given fishery, there might be need to consider each act of violation in the full context of all its extenuating circumstances. Put differently, was the infraction deliberate or was it committed out of desperation? Sutinen in Nielsen (2003) shares similar sentiments and posits the argument that fishers will comply with regulations to the extent that they perceive them to be consistent with their livelihood needs.

3.8. Should the Fisherman have violated the Regulation on Fishing Gear Restriction?

The majority (87%) of the respondents felt that the fishermen should not violate management regulations. Only 13% of the respondents felt that the desperate nature of fisher's plight warranted the violation. It was the general feeling that "a law is a law" and should accordingly be observed by everyone.

3.9. Would a Fisher Violate Regulations to Serve his Dependents?

This question brought to question the individual fisher's normative values. Nielsen (2003) describes normative values as the fisher's internal obligation for compliance behaviour. All respondents (100%) overwhelmingly indicated that they would not violate regulations to save their spouses' and children's lives. 32% of the respondents thought it was better to safeguard their long-term livelihoods by conserving the fish. 12% of them pointed out that it could actually prove to be dangerous if fishers chose to violate fishing regulations which could even expose the wives and children to greater risk. 8% of the respondents commented that fishing was seasonal and therefore it would be better to try other livelihood sources until such time that catches were good. It would appear the fishers' internal moral obligation to obey the regulations is quite high. What this means is that fishers generally regard it as legitimate that ZPWMA have the right to make decisions with regards the management of the fishery and are therefore willing to comply with the regulations that they make and enforce.

3.10. Changes that Fishers Would Want Instituted in the Regulatory Institutions

Management committees and members of the fishing co-operatives who were investigated pointed out a number of changes or improvements that they would want instituted in the regulations, their enforcement and the institutions that enact and enforce those regulations. It was established earlier in this paper that fishers tend to feel more obligations to complying with regulations that they had a role in formulating than regulations that appear to have been dictated by a distant authority. It is therefore important for fishers to feel that their views have been considered in coming up with the regulations. Such regulations are, in any case, more likely to be consistent with the fisher's interests.

3.11. Suggested Changes and Improvements in the Regulations Themselves

Miller (2006) observes that some of the ways fisheries management authorities use in controlling the fishing effort include enacting protective laws to regulate the timing and length of

fishing expeditions, determining the minimum fish size that can be taken, establishing fish quotas and requiring that nets have large enough mesh size to ensure that young fish are not harvested. To achieve these, management authorities (ZPWMA) at Lake Chivero make use of time and gear restrictions. Gillnetting is only allowed between sunrise and about 4 pm while seine netting is only permitted from 10.30 am and ending at the same time as gillnetting. Gillnetting is only allowed up to noon on Saturdays. Seine netting is not allowed whatsoever on Saturdays. The reasons put forward by the authorities for enforcing these times restrictions is for the safety of the fishers as well as for ease of monitoring compliance with regulations. All of the respondents expressed their desire for the management authorities to allow seine netting to start at the same time as gillnetting so that they could maximise their catches and be able to raise the license fees. They also implored ZPWMA to allow seine netting to be done up to noon on Sundays. This finding seems to indicate that as far as the time restrictions are concerned, fishers generally felt the regulation was not consistent with their interests.

3.12. The Manner in which the Regulations are enforced

Suggestions raised on the manner in which the regulations are enforced are explained below.

3.12.1. The Catch and Gear Impoundments

One way of penalising violators is for management authorities to impound catches and fishing gear and this practice is quite common place at Lake Chivero. Most management committees of the fishing co-operatives claimed that often poachers, their own employees or employees of sister co-operatives steal their catches or gillnet overnight which they then use illegally. 53.8% of the respondents claimed that their nets were always getting stolen and being illegally used. The fishers raised a request that each time ZPWMA officers impounded such fishing gear they should endeavour to expeditiously return them to their rightful owners whilst they dealt with the culprits. They charged that sometimes there were delays of up to several weeks before they got their nets back. Sometimes some corrupt officers illegally sold the nets, a practice which they claimed was becoming very rampant. This, they claimed sometimes completely paralysed their operations. Such practices have potential to lower the perceived legitimacy of the regulatory institutions thereby providing an incentive for non-compliant behaviour.

3.12.2. The Fishing Effort Controls

The fishing effort in a given fishery should be controlled by restricting the length (in metres) of netting (gill or seine) each operator is allowed to use in a single fishing trip. The total length of the nets the operator is permitted to cast on a single trip should therefore not be in excess of that limit otherwise he/she will be violating the regulation. At Lake Chivero, each fishing co-operative is allowed up to 1 600 metres (1.6km) of netting. This study sought, therefore to establish if the set limit was perceived to be adequate by the respondents. The majority (81%) of the respondents felt that the 1 600-metre limit fell far too short of what they required to at least break even. The majority of the respondents wanted the fishing effort to be at least doubled.

3.12.3. Corruption and Anti-Poaching Efforts

Corruption compromises the perceived legitimacy of the regulatory institutions. To reduce corruption, respondents suggested rotating rangers at much shorter periods than is currently the case as and improving their conditions of service. Fishers reported losing a lot of income to the activities of poachers and suggested the scaling up of anti-poaching efforts. All respondents felt ZPWMA was under resourced and more resources were needed. They specified cars, boats, ammunition, camping equipment etcetera. Many of the respondents felt the authority needed to embark on a massive recruitment and training exercise.

3.13. The Effectiveness of the Rangers' Monitoring and Enforcement Efforts

Effectance motivation refers to the kind of motivation employees get when they feel that they are being effective in their jobs. This is the feeling of success workers derive from their jobs. Respondents were asked to rank how effective they felt they were as a fisheries management authority in terms of whether they were doing it very well not very well or not coping at all. None of the respondents (0%) felt the authority was coping well, 53% not very well and 47%, not coping at all. What this scenario means is that the rangers all felt a lot more needed to be done. Two major reasons for this situation were cited as that the authority was poorly resourced and that morale among rangers was generally very low. Other reasons cited were that, due to the prevailing economic hardships, there were now more infractors and that these had redoubled their efforts at violating. On the other hand ZPWMA had not done much to meet the increase in violations. Workers derive effectance motivation from knowing and feeling that they are being effective in their jobs. The need for achievement (the need to excel, to achieve in relation to set standards or to strive to succeed) influences the behaviour of some people. Some people have a compelling drive to succeed wherein for personal achievement rather than rewards per se. They have desire to do something better or more efficiently than it has been done before. When this is not forthcoming, they get frustrated and dissatisfied with their jobs. All of the respondents felt that ZPWMA were either not doing well or coping well at all. Under such conditions, highly ambitious rangers can be expected to be very dissatisfied with their jobs.

3.14. Suggestions by Rangers on what the Management Authority should do differently in Order to Better Cope with Non-Compliance

A number of suggestions were put forward in this regard. First was that there is need to improve the rangers conditions of service. There also was need for more equipment especially boats and vehicles some of which, the rangers said, were now too old. Another suggestion was that of recruiting and training more rangers so more of them could be deployed to over-poached areas. Penalties needed to be made stiffer. A number of respondents suggested the establishment of more bases and camps along the shores of the lake and the need for better provisioning in terms of food rations and camping equipment. Over 50% of the respondents suggested the introduction of a dog section and the introduction of permanent blocks on all roads leading into and out of the lake. Some respondents felt that there was need to involve more donor and non-

governmental organisation for both material and technical support as ZPWMA clearly lacked capacity to contain the non-compliance problem.

4. SUMMARY OF RESULTS AND RECOMMENDATIONS

The results that emerged from the study is that psychological and social factors are more important in securing compliance with regulations than relying solely on economic or deterrence factors. These psychological and social factors are intrinsic to fishers and were not fully considered and incorporated when the regulatory institutions at the Lake Chivero were designed. As a result the present regulatory institutions are not perceived as legitimate by fishers. Consequently, although many of fishers feel the regulations are good, they feel little motivation for complying with them. Deterrence factors focus primarily on manipulating the probability of detection and conviction of violators as well as the sanctions imposed on them for violators.

This study found such an analysis of compliance behaviour inadequate as it ignores the psychological and social influences which in some fishers are even more potent in the fishers' decision-making context. It was also found that from an economic point of view, these psychological and social factors can complement the efficiency goals of an enforcement programme. When they are fully considered and incorporated in coming up with management regulations, they have potential to enhance the perceived legitimacy of the regulations thereby engendering high levels of compliance with them. This makes the regulations more self-enforcing thereby significantly cutting back on the costs of implementing the enforcement programme.

Fishers' perceptions of how legitimate and acceptable they find the existing regulatory institutions are important. These perceptions emanate from the fishers' actual experiences with the enforcement agents. They are also influenced by the extent to which they perceive the existing regulations to be consistent with their livelihood needs. The majority of the fishers felt the management at authorities do not treat all fishers consistently and fairly. The study found that the main reasons for this situation are corrupt practices by the Parks and Wildlife officers as well as the lack of capacity by ZPWMA to effectively and consistently police all parts of the lake.

The more morally developed a fisher is, the more likely they are to comply with regulations given that they perceive them to be legitimate. The study found the majority of the fishers to be fairly highly morally developed. Although this would normally be expected to produce greater levels of compliance with regulations, it was found that fishers still infringed regulations. Due to the fact that a significant number of ZPWMA officers facilitated the actions of violations through corrupt practices, fishers felt justified to violate too. Therefore, the transparency with which management authorities enforced the regulations as well as the behaviour of other fishers in the fishery emerged as key variables in the fishers' decision-making context.

It was the general feeling among respondents that many of those who violated the regulations, were not brought to book due to corruption. It was found that this was also due to the fact that ZPWMA was grossly under-resourced in terms of human, financial and material resources. It also emerged that the majority of the rangers had low levels of satisfaction with their jobs. The study also found that many of the rangers did not feel they were being effective in their

jobs and were therefore low in effectance motivation. The other reasons identified for the low levels of motivation were poor salaries and inadequate opportunities for professional growth and development. This could explain the apparent apathy with which the rangers discharge their duties as well as the increase in cases of corruption.

The issue of insecurity of tenure emerged as another critical factor in the non-compliance problem at Lake Chivero. ZPWMA issued letters to about a third of the co-operatives to the effect that their permits were going to expire. This is the first time fishers have ever received such letters and they are worried about what will be their fate after the expiry of the permits. They are also not sure what criterion was used in issuing the letters. Such uncertainty encourages undesirable short-term strategic behaviour. It also means fishers cannot plan ahead and make long term investments in the resource. As can be expected, fishers will develop little stewardship over the resource if their tenure over the fish resource is unclear.

4.1. Policy Implications

One of the key objectives of this study was to propose strategies for improving compliance. The fairness and justice with which the regulations are enforced, how consistent they are with the fishers' livelihood needs, how democratic the regulatory institutions are and how consistent the regulations are with the goals of conserving the fish resource are some of the variables that emerged as the critical determinants of the perceived legitimacy of the management regulations among the fishers. The policy implications of each of these variables are presented in this section.

4.2. Probability of Detection and Enforcement

Under the economic model, the probability of detection and the severity of the penalty when detected are seen as the key factors in securing compliance with management regulations. Though these economic factors play a very important role in securing compliance, they however, constitute a rather high cost alternative because they ignore other societal problems. Psychological and social factors, on the other hand, make it possible for management authorities to secure compliance without the requirement to expend large amounts of enforcement resources. Enforcement inputs should therefore be utilised together with the positive reinforcement of the psychological and social factors.

To fish legally, one need to pay the license fees and buy the authorised fishing gear and this represents investment or entry costs which do not apply for those fishing illegally. Given the current difficult economic conditions in the country, to most people, personal and family survival comes first before resource sustainability. For individuals finding the investment costs of entering the fishery unaffordable, fishing illegally is a much a cheaper option than fishing legally. As can be expected, more and more people are going to be fishing illegally because of economic pressures. Fisheries management frameworks premised on the economic model would respond to such increase in non-compliance behaviour by increasing the enforcement efforts alone.

ZPWMA do not have adequate resources to combat the increasing non-compliance behaviour. Therefore, the targeting of enforcement resources of flagrant violators or key areas

where violations are high may be one way of increasing the effectiveness of the enforcement programme of Lake Chivero. If arrests and the prosecutions made are publicised and made known to the rest of the fishing community, then this may have a multiplier deterrent effect on the rest of the fishers thus reducing the violation rate.

4.3. Moral Development Level

The moral development level is one of the non-deterrent factors important in realising compliance with regulations in fisheries. In fact, this intrinsic factor that brings about compliance without the need for significant enforcement would be extremely useful from a policy perspective. Fishers at the post-conventional stage accept better and comply more with fisheries regulations than those at the conventional and pre-conventional stage respectively. Therefore, the identification of fishing populations along such identifiable stages of moral development could help fisheries management authorities to deploy their enforcement resources in areas where violators may form the majority. Equally, important, such information could come handy in assisting policy makers and programme planners more efficiently deploy resources to environmental awareness and education programmes, and campaigns to raise people's levels of moral development. This, in the long run, could produce more voluntary compliers who in return can be used to further enhance regulatory programmes and overall compliance.

4.4. The Influence of Others

The issue of influence of others on the compliance behaviour of fishers at Lake Chivero emerged as closely related to the increase in corrupt practice by ZPWMA officials. It is generally, accepted in compliance literature that if the fishers believe that a large proportion of the fishing community are violating the regulations then they are also very likely to violate too. From an enforcement policy perspective this means that if many of the fishers are getting away from detection and arrest, the overall compliance rate falls. For the regulatory programme to be effective, it must be able to ensure that the frequent violators are detected and arrested. More importantly, and it must also ensure that those arrested do not buy their freedom using bribes and must face the full wrath of the law. This will increase the credibility of the regulatory authority as well as the social repute of those fishers who do not violate.

From a policy perspective, the release of regular information on the arrest and conviction for frequent violators as well as ZPWMA authorities who engage in corruption will further strengthen the social norm to comply and thus reduce the aggregate violation rate. ZPWMA must not only make known its stance on corruption to all players in the fishery, but must also be seen to be vigorously and tirelessly upholding it.

4.5. Concerns about Legitimacy

A regulatory system cannot be better than is permitted by the fishers. If the fishers are intent on circumventing the regulations they cannot be stopped no matter how strict the supervision is. Therefore, the rules and regulations have to be accepted by fishers if an enforcement programme

is to be effective. The rules have to conform, at least, to a certain degree to what are considered fair, just and legitimate among the fishers. If not, then enforcement becomes prohibitively costly.

Implicit in the above argument is that management authorities have to pay more attention to the legitimacy aspects of the regulatory programme and just rely on legislation alone. There will be need to pay particular attention to the distributive justice aspects of the regulations. This means greater care will be needed in the institutional aspects of the regulatory system with a view to making it perceived as more democratic, transparent and participative. In this regard, use may need to be made of whatever social bargaining devices are present in the society in a bid to incorporate the fishers' views and interests in the regulations. The distributive aspects of the regulations will need to be explained to the fishers, illustrating how complying with the regulations will generate benefits to them in the short and long-run.

4.6. Conditions of Service for the Zimbabwe Parks and Wildlife Employees

Lastly, this study also found the ZPWMA as an employer to be rather low in prospects for occupational mobility. The rather narrow structure that characterises most public service management structures reduces workers chances of promotion. Consequently, most ZPWMA employees felt this lead to their stagnation in the same post for many years. It was also the general feeling that whatever levels of academic and professional training attained by the rangers on joining ZPWMA or during their stay with the authority did not find expression in the positions they held the benefits they received. The rangers found the military style of ranking and upward mobility rather constricting and frustrating. This factor was found to combine with the poor salaries and other job conditions to produce low levels of job satisfaction. These factors negatively impact on the rangers interactions with fishers in the form of corruption and other undesirable actions. Therefore, alternative job ranking and promotion systems need to be tried which promote employees on the basis of merit, qualifications and ability.

5. RECOMMENDATIONS FOR FUTURE RESEARCH

This study reveals the possible causes of persistent non-compliance with management regulations at Lake Chivero Fishery. The study suggests that the current regulatory institutions be revamped with a view to fully incorporate all the socio-economic and psychological factors at play in the fishery. To effectively achieve this aim, a number of critical questions will need to be closely investigated. These include:

- a) What are the psychological, social and other factors influencing compliance behaviour in the fishery? How can they fully be incorporated into a new fisheries' management framework?
- b) How can the existing institutions be maintained in order to secure greater compliance with management regulations?
- c) What prospects exist for core management?
- d) How greater stakeholder participation be achieved in the formulation and implementation of management regulations?

- e) How can the job conditions of ZPWMA employees be improved in order to induce greater job satisfaction and motivation?
- f) What social bargaining devices are present in the fishing community at Lake Chivero and how can they be utilised to make the rule-making and enforcement process participatory, legitimate and acceptable to all players?

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