

# Rethinking small-scale fisheries compliance

Maria Hauck\*

*Environmental Evaluation Unit, University of Cape Town, Private Bag X3, 7708 Cape Town, Western Cape, South Africa*

Received 25 October 2007; received in revised form 13 November 2007; accepted 14 November 2007

## Abstract

Fisheries compliance has been identified as key to sustainable fisheries management. However, it has been widely acknowledged that the approach by many governments worldwide to achieve compliance is largely through law enforcement efforts. Although theories of normative action have expanded compliance thinking from that of rationalist approaches, this paper takes the argument further. By drawing on criminology and security discourse, and on empirical research on small-scale fisheries in South Africa, this paper argues for a new approach to our understanding of compliance. Furthermore, it argues that rather than taking law as given, the formation of law and the power dynamics influencing such processes are critical aspects that need to be acknowledged and understood in fisheries compliance theory.

© 2007 Elsevier Ltd. All rights reserved.

*Keywords:* Small-scale fisheries; Compliance; Power; Law; Social justice

## 1. Introduction

According to a recent report by the United Nations Food and Agriculture Organisation, fisheries around the world are in crisis [1]. Hardin [2] would argue that this is so because of the ‘tragedy of the commons’, whereby individuals pursue their own self-interest at the expense of the welfare of a group. Key to this model is the assumption that individuals act rationally and choose to maximise their own welfare over others [3]. Central governments, therefore, are required to intervene to protect and control natural resources and to prevent over-exploitation. Traditional compliance strategies also embrace this approach and are based on the assumption that fishers are rational actors and their behaviour is influenced by the costs and benefits of their actions [4].

Over the past three decades, alternative theoretical approaches to Hardin’s model have been proposed, which recognise that there are many circumstances in which individuals cooperate to govern shared resources [3,5,6]. In Ostrom’s [7] discussion of collective action and the

development of rules and norms, she identifies a number of principles that are key to successful self-organised resource regimes. These include the presence of rules and the monitoring and sanctioning of free-riders. Dietz et al. [8] argue that a key aspect of effective commons governance is ensuring rule compliance. However, whether formal or informal strategies are in place to enhance compliance, they argue that those who impose the rules must be seen as ‘effective and legitimate’ or resistance and evasion will be inevitable (p. 1911). Thus, it is argued in this paper that a central premise to understanding fisheries compliance must relate directly to how rules and laws are developed, and by whom. Issues of power, and how those in power determine what is to be considered and controlled is central to this understanding. Drawing on both criminology and security discourse, this paper attempts to rethink fisheries compliance by linking the objectives of social justice and environmental justice in order to understand how ‘harm’ is defined, and subsequently how laws are developed. Furthermore, by drawing on the experiences of small-scale fisheries in South Africa, it is argued that an understanding of compliance should not take law to be a given, but should challenge existing laws, especially those that further marginalise small-scale fishers.

\*Tel.: +27 21 650 2872; fax: +27 21 650 3791.

E-mail address: [maria.hauck@uct.ac.za](mailto:maria.hauck@uct.ac.za)

## 2. Understanding compliance

Compliance is generally understood as the behaviour of people to conform to rules that have been developed to influence actions [9]. These rules may exist as formal laws or as informal norms, thus being monitored and enforced through either formal or informal mechanisms, and sometimes by both. Studies of compliance have been conducted over the past decades by scholars in a range of disciplines, including criminology, sociology, psychology, economics, political science and anthropology [9–11]. In the sphere of the natural environment, questions of compliance have largely related to large-scale industrial actions such as pollution, transportation of hazardous wastes and destruction of natural resources [11].

Compliance research has largely been rooted within two schools of thought. One explores the ‘rationalist’ models of deterrence and law enforcement that assume that rational actors calculate costs and benefits of their actions, and the second explores the ‘normative’ models that investigate norms, morality, legitimacy, and social and cultural influences on individuals’ decisions to comply with rules and laws. These different perspectives to understand compliance have also translated into different methods and strategies for regulating behaviour.

If one explores the development of fisheries compliance theory, the rationalist perspective, which emerged as an economic analysis of non-compliant behaviour, dominated its earlier years [12,13]. This approach understood non-compliance largely as a result of external influences (such as rewards and punishment), resulting in individual fishers acting in their own self-interest. Thus, based on this perspective, fishers will choose to comply (or not) based on economic gains and severity of sanctions. This school of thought has significantly influenced fisheries management worldwide [14], and has generally led policymakers to increase deterrence, usually through greater law enforcement efforts [15].

The shortcomings of the above approach, however, have been outlined in the literature over the past decade. Other factors have been identified that help shape compliant behaviour. These include moral and social norms, social pressure, perceived legitimacy of management rules and laws, as well as the management authority, and fisher involvement in decision-making and management [10,14–22]. These studies have thus explored mechanisms to increase normative support for rules and laws, such as informal sanctions and participatory management.

In his extensive review of the compliance theory, specifically as it relates to fisheries, Gezelius [10] argues that these two models of understanding behaviour—rational choice theory and theory of normative action—are not mutually exclusive. Rather, elements of both are important and necessary for formulating an integrative theory of fisheries compliance. While combining these schools of thought may arguably be fruitful, or even necessary, in order to understand compliance, it is

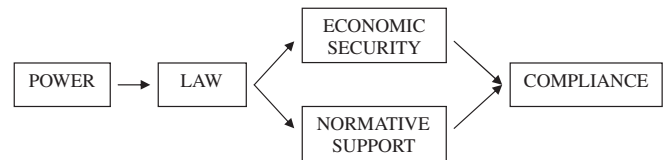


Fig. 1. The influence of power and the formation of law in understanding fisheries compliance (drawn on from comments by Gezelius, *in litt*, 2007).

questionable whether it is sufficient in order to fully understand it.

This paper, therefore, challenges a key assumption of the traditional compliance theories, arguing that a conceptual understanding of compliance requires a critical analysis of how law has evolved, and the power dynamics that have shaped it (Fig. 1). Thus, the law itself needs to be questioned, including how it is defined, and by whom. Although this perspective challenges the current compliance theories to think beyond the law, it is particularly relevant in a developing country context, where social and economic inequities are rife.

This paper draws on research from South Africa, a relatively young democracy (since 1994), which has experienced a plethora of new laws over the past decade and is grappling with a range of social, economic and environmental challenges. In this context, and arguably in relation to small-scale fisheries more generally, it is argued that law cannot be taken as a given, and needs to be questioned in relation to fisheries compliance discourse.

## 3. Stepping back: where does the analysis begin?

Criminologists have long been attempting to understand the construction of crime, the definition and impact of harm and the responses required to minimise such harm. In the 1970s, the tradition of critical criminology emerged, which developed a political economy approach to crime and exposed the role of power in understanding and defining crime [23]. Thus, a broader conceptualisation of crime was embraced, which argued that it needed to be understood within a social, political and economic context, that inequalities needed to be recognised and that criminological analysis should not be limited to what the state defined as illegal [24].

Similar debates, relevant to the topic of this paper, occur in the area of environmental harm, determining under what conditions an act should be conceived of as an environmental ‘crime’, and the resulting strategies to address ‘crime’ that are developed based on a particular perspective [25]. The emerging focus over the past decade on a wide variety of environmental issues in the discipline of criminology has led to what has become known as ‘green criminology’ [26–28]. Although there are debates within this growing discourse [29], general principles relate to the strong links between human rights and environmental rights [27,30], the importance of the role of law in defining environmental ‘harm’ [25,31] and the necessity to embed an

understanding of harm, and responses to such harm, in a broader contextual frame [26,32].

Key to this discussion is reference to the role of power in determining what behaviours become the focus of law and why. It is argued that environmental crimes are socially constructed, are shaped by relations of power, are largely created to protect capitalist interests and tend to marginalise the powerless (often recognised by class, race, and gender hierarchies) [25,27,31]. Thus, environmental harms and social injustices are intertwined [33]. The eco-human rights approach to environmental harm, for example, aims to build a bridge between the objectives of human rights movements, to attain social justice, and the objectives of environmental groups, to attain ecological well-being [30]. Halsey [30] argues that criminologists need to look for solutions to the environmental crisis by understanding the ‘roots’ of harm, particularly the social, political, cultural and economic context. This is further emphasised by Barton et al. [24], who argue that social harms need to be thought of ‘in terms of *social justice* rather than *criminal justice*, to enhance, rather than undermine, democratic and legal accountability, and to develop research agendas that provide the potential to challenge, rather than consolidate, the interests of the powerful’ [24] (211, italics in original). The aim of this paper is to explore these theoretical concepts within the area of small-scale fisheries, and to depart from the existing compliance literature by critically addressing the role of law in criminalising fishers.

#### 4. A conceptual framework: small-scale fisheries

The link between environmental rights and human rights is particularly acute when discussing the plight of small-scale fisheries around the world. Small-scale fisheries have not been universally defined but generally encapsulate the terms ‘subsistence’, ‘traditional’ and ‘artisanal’ [34,35]. Although each context will be different, small-scale fisheries can be broadly characterised as employing labour intensive harvesting to exploit fishery resources by operating from shore or from small fishing vessels. As Bavinck [36] explains, small-scale fisheries can encompass a wide range of attributes and can be differentiated from the better known ‘industrialised’ or ‘modern’ fisheries. Generally speaking, small-scale fishers use less capital intensive gear and their catch per unit of effort is much smaller than those in the industrialised fisheries.

It is estimated that 90% of the world’s fishers are small-scale fishers, with most residing in developing countries [37]. Approximately 1 billion people rely on fish as a major source of animal protein [38], and according to Berkes et al. [39], ‘the importance of the world’s fisheries, and especially the small-scale fisheries, in providing food, income and livelihood cannot be overemphasised, especially in developing countries’ (p. 223). However, despite its importance in providing food security and livelihoods in coastal communities, small-scale fisheries are largely ignored and marginalised throughout the world [39]. This is particularly

evident in fisheries management policies, which often favour the capitalist interests of large-scale industrial fisheries over small-scale traditional ones [40,41]. This was emphasised by the FAO [42] Committee on Fisheries Research, which stated that economic policies at a national level have favoured ‘the development of large-scale approaches over small-scale ones and the resources being concentrated in fewer and fewer hands’ (p. 9).

This conflict, and the increased reliance of coastal communities on fisheries resources, has come at a time when fish stocks, and the ecosystems upon which they depend, are being rapidly degraded. It is estimated that 70% of fish stocks are fully exploited or overfished worldwide [43]. Thus, a crisis exists not only in terms of the future of fisheries, but also in terms of sustaining the livelihoods of coastal communities around the world.

#### 5. Complex social and ecological systems

In order to better understand the factors influencing (non)-compliant behaviour and thus effectively respond to them, it is necessary to gain a broad understanding about the inter-relationships that exist, and the complexities that are evident in a system where people and the environment co-exist. In criminological discourse, this would be about defining and responding to both social harm and environmental harm, which is relevant to critical criminology and encompassed in the eco-human rights perspective [25,30]. Ultimately, this is about achieving social and environmental justice by addressing the inequities in the current social system whilst simultaneously sustaining the ecosystem [27]. As Halsey [30] explains, the connection between the conditions that degrade human beings and the conditions that degrade the natural environment need to be acknowledged. Thus, the notion of ‘harm’ in this context understands ‘the well-being of nonhuman life to be an *indispensable* prerequisite for human well-being... human rights [are] inextricably bound to the well-being of nonhuman life’ [30] (p. 228, italics in original).

This recognition of the need to obtain human and environmental rights and the relationship between the two is also embedded in a new discourse on security. Whereas traditional perceptions of security were largely concerned with a state’s ability to counter external (largely military) threats, this has been broadened to include political, economic, social and environmental threats [44]. The concept of human security has received growing attention in recent years and emphasises the importance of protecting people’s fundamental rights, such as freedom, peace and safety, access to resources and the basic necessities of life and an environment that does not threaten health and well-being [45,46]. It is argued that these, in fact, are the greatest security risks to states and government. As Thakur and Newman state [47], ‘these issues *become* security concerns when they reach crisis point, when they undermine and diminish the survival chances of significant

proportions of the citizens of society, and when they threaten the stability and integrity of society' (p.3, italics in original). Harm, in this context, relates to the insecurity of people around the world in terms of sustaining basic human rights. Halsey [30] explains that 'criminal conduct [or harm]—from a critical human rights position—becomes equated to the actions of those agencies, structures, and bastions of power that prevent the universal implementation of these rights' (p. 227).

In terms of the environment, the notion of environmental security gathered momentum in the mid-1990s [48], with a specific focus on the threat of environmental deterioration on human well-being, but increasingly including the impact of threats on the ecosystem in and of itself [44]. There is widespread recognition in the literature that environmental security encompasses many other aspects of security (including political, economic, and social) and therefore is intertwined with social inequity and injustice, poverty, societal vulnerability, weak political structures, population growth, unsustainable economic growth, industrialisation, and growing demands for resources [48–52].

In fisheries, however, the connection between the fishers themselves, and the resources they harvest, has not always been acknowledged. Traditionally, fisheries resources have largely been allocated and managed through scientific expertise that has focussed on national economic objectives rather than the people and livelihoods that are affected [42]. Thus, fisheries management has largely been the responsibility of fisheries biologists and economists, which has resulted in the neglect of the experience of traditional fishers [53]. Even when there were attempts to 'develop' fisheries in the developing countries, 'the goals of fisheries development were generally "biological" (high catches, utilisation of all resources, etc.), to the near complete neglect of social goals such as employment, community well-being, food security, etc. [53] (p. 9).

However, more recently, the growing role of social sciences in the area of fisheries' management has highlighted the importance of understanding broader social issues, and linking disciplines to secure both resources and people [54–57]. This is explicitly highlighted by Chuenpagdee et al. [58], who state that fisheries challenges need to be tackled by acknowledging the 'interconnectivity of concerns for ecosystem health, social justice, livelihoods, and food security and food safety' (p. 25). This link between social and ecological systems, is emphasised by Berkes et al. [59] as being critical to understanding, and ultimately achieving resource sustainability. It is argued that natural and social systems are complex in themselves, and the interactions (and links) between them create even more complexity [57,59]. Thus, multidisciplinary approaches are required to 'bridge disciplines and scales, and blend theory and practice, if we are to understand these linked complex systems and, on the basis of this knowledge, to design more effective systems of governance' [60].

## 6. Understanding fisheries compliance in South Africa

South Africa, a country that witnessed its first democratic election in 1994 and has undergone a decade of fisheries transformation is facing a number of challenges in terms of small-scale fisheries. The linkages between social and ecological systems are glaring as poverty-stricken coastal communities are increasingly relying on diminishing fish stocks, as they are in other parts of the world [61]. However, in South Africa, the inextricable link between human rights and environmental rights is enshrined in the Constitution [62], which is the point of departure for all law and policy-making in the country. Embedded in the Bill of Rights is an environmental clause that guarantees everyone a right to an environment that is not harmful to their health or well-being [63]. Government is then given the responsibility to take reasonable legislative measures to protect the environment, prevent pollution and ecological degradation and promote conservation. Further, government laws and policies are expected to secure sustainable development, and the use of natural resources at the same time as promoting justifiable economic and social development [63]. The challenge, however, is the development of laws and policies that are put in place at a sectoral level, which interpret constitutional provisions in different ways. In fisheries, for example, policies are influenced by the conflicting objectives of national frameworks that govern social development and equity, macro-economic policy and principles of environmental sustainability [64]. This lack of coherence at a national level has led to the 'subordination' of the principles of social equity and environmental sustainability to the goals of economic efficiency. As van Sittert et al. [64] state, the effect 'in terms of fisheries reform has been to sideline issues of poverty and food security in pursuit of economic growth, efficiency and stability' (p. 98). Thus, the marginalisation of small-scale fisheries needs to be understood in this current political context, in addition to the broader historical context of inequity, which van Sittert [65] argues has been evident over the past century.

Prior to the new democratic fisheries law in 1998, small-scale fishers in South Africa were considered 'illegal' by the state or operated under the regulations governing recreational fishers [34,66]. Thus, subsistence fishing activities were either ignored (in areas where law enforcement capacity was low) or addressed by law enforcement efforts that resulted in fines or imprisonment. These fishers were considered 'non-compliant' in terms of the national and provincial laws of the apartheid regime. More recently, since 1998, small-scale fishers have been given the opportunity to formally (legally) obtain access to marine resources. This has been through the allocation of subsistence fishing rights and through 'limited commercial' rights, which are essentially a small-scale quota allocation.

In terms of compliance, from government's perspective, the redistribution of formal access rights to fisheries has meant that many more people, operating along a 3000 km

coastline, need to be managed and monitored. Furthermore, with political pressure to redistribute economically viable access rights, the need to minimise over-exploitation of stocks is particularly critical. The danger posed by ‘illegal’ fishing, therefore, has motivated the fisheries authority to significantly increase its investment in promoting fisheries compliance, largely through law enforcement [67].

The problems, however, only seem to be exacerbated. Although there has been a significant increase in the number of people who are legally able to harvest fisheries resources in South Africa, many traditional fishers have still been excluded [34,64,68]. It is argued that this is due to inequitable policy implementation and the powerful local elites hijacking the opportunities of *bona fide* fishers [68]. In addition, the powerful economic interests of the state and large capital have marginalised small-scale fishers by prioritising their own interests over the socio-economic needs of traditional fishers [61,69]. Inevitably, this illegitimacy of the management system has led to ‘protest fishing’, where fishers who do not have a legal permit continue to fish because they believe it is their right to do so [67,70]. Similarly, in referring to the politicisation of fisheries in the mid-1900s, van Sittert [69] argues that the state used its power to create monopolies and to dispossess traditional fishers of their rights. As a result, with a lack of popular legitimacy, ‘the state found itself assailed on all sides by acts of social banditry, with endemic ‘poaching’ and the concomitant rise of ‘black markets’ in the inshore fisheries...’ (p. 46).

## 7. Power and evolution of law

The influence of power, and the imbalances that exist, are necessary to understand in the context of fisheries compliance. It is not enough to simply ‘address’ those who are not complying with laws, but a more in-depth understanding is required that focuses on the evolution of those laws in the first place, and their impact on social and economic inequities. Thus, in the South African context, it is first necessary to explore the formulation of formal law in determining what is ‘illegal’ [71].

The promise of the new democratic government in 1994 was ‘the upliftment of impoverished coastal communities through improved access to marine resources’ [72] (p. 114). Thus, a key objective of the 3-year marine fisheries policy process was to develop a fair system of allocating access rights, particularly to those who had previously been denied such rights [73]. However, implementation of the fisheries policy led to controversy and litigation as there was no detailed strategy for the re-allocation process and there was a lack of institutional capacity and skills to manage transformation [74,75]. Furthermore, the small-scale fisheries sector was neglected due to excessive attention given to the development of a legally robust permit application and allocation procedure for the commercial sector [66]. Thus, the process of determining

legal access to small-scale fisheries in fact excluded many *bona fide* fishers [34,68]. This led to the legal recognition of some fishers, but not all. Therefore, the legitimacy of the allocation of rights, the prioritisation of the large-scale sector and the creation of an ‘illegal sector’ that emanated from an exclusionary process, is put into question.

The definition of what constitutes an environmental crime, therefore, can be contested [25,31]. For example, some *legal* industrial activities may in fact be more detrimental to the environment than those deemed illegal by the state [30,76]. In the fisheries context, for example, small-scale fishers argue that fishing methods and quantity of catch of highly industrialised fisheries (which are legal) far outweigh the negative impacts of the catches of those small-scale fishers who are considered illegal by the state, but who rely on these catches for their livelihoods [77]. Thus, as is the case with environmental governance more generally, local stakeholders will find it difficult to have their interests recognised alongside the interests of other stakeholders who are more powerful and have contrasting goals [78].

The definition of ‘crime’ can also be assessed from another perspective, arguing that harm can be perpetuated by declaring certain activities to be criminal. As Scruton and Chadwick [79] explain: ‘criminalisation, the application of the criminal label to an identifiable social category, is dependent on *how* certain acts are labelled and *who* has the power to label, and is directly related to the political economy of marginalisation (p. 289, italics in original). This is the case of criminalising indigenous people’s rights of access to natural resources [28,32]. In South Africa, for example, harm is exacerbated by protest fishing, which not only threatens resource sustainability, but also leads to conflict (sometimes violent), social unrest in coastal communities, and animosity between the fishers and government [67,80]. Thus, defining what is legal or not, who determines this, and more specifically in the fisheries context, who receives access to resources or not—and the resulting rules of exploitation [57], has significant implications for how compliance is understood and achieved.

The allocation of fisheries rights, therefore, is directly related to issues of social justice and power [58]. However, in South Africa, government has ‘adopted a resource-oriented as opposed to a people-centred approach to natural resource management. While the principle of sustainability must underpin any rights allocation and resource management approach, it must be tempered by socio-economic and cultural considerations, and may at times require trade offs in favour of social equity’ [34] (p. 68). At present, however, there still exist many small-scale fishers who have been excluded from formal (legal) access to resources, and a subsistence, or small-scale fisheries management policy, has yet to be finalised by the government. In contrast, medium-term rights and long-term rights in the commercial fisheries have been implemented since 2001 and 2005, respectively. This seems to support Dietz et al.’s [81] recognition of the trade-offs that

occur in terms of policy, which is frequently dominated by the goal of economic efficiency. Capitalist interests, therefore, are often the power behind policy decisions and laws [27]. As Adger et al. [78] explain, ‘the powerful in society maintain their privileged position by legitimising it through a system of rules, conventions, and institutions’ (p. 1099). Thus, the complexities of understanding how rules and laws are developed, and the power dynamics behind them, are critical to an understanding of compliance. Barton et al. [24] argue that an exclusive focus on law enforcement often leads to the realisation that crime control efforts are often targeted at the criminality of marginalised groups, requiring an analysis of the relationship between ‘processes of marginalisation and criminalisation’ (p. 7).

This directly relates to the need to understand the ‘roots’ of environmental harm, particularly in its social, economic, political, and institutional contexts [30]. There is broad acknowledgement that environmental protection and/or degradation are influenced by, among others, power, poverty, political structures, governance arrangements and economic growth and industrialisation [25–28,30,49,50].

## 8. Conclusion

Research on fisheries compliance has only recently begun to explore the variety of relevant variables that influence fishers’ behaviour [16–18,22,82]. These investigations have not only identified the complex interactions taking place in fisheries but have begun to highlight a concern for traditional crime control strategies that are required to respond to, and address, resource over-exploitation and decline. But even these theories of normative action need to be taken a step further to analyse the evolution of law and the powerful interests behind it. Thus, an understanding of compliance needs to recognise the linkages that exist between the diverging factors that influence harm, and more specifically between issues of social and environmental justice, which generally need to be understood in their historical context. Empirical research on small-scale fisheries compliance in South Africa is beginning to explore these linkages, and the factors that influence fishers’ decisions to comply, or not, with rules and laws [71].

There is a need to rethink our approach to compliance in small-scale fisheries. In South Africa, where rules governing small-scale fisheries are embedded in historical legacies and power inequities, crime control methods will not achieve sustainable fisheries. This approach is advocated more broadly in South Africa, with criminologists arguing for a more critical approach to understanding and preventing crime [83]. It is argued, for example, that harms in this country should not be constituted as crimes simply because they are defined as such by state law, but should be recognised and tackled by a broader social policy in order to ‘advance the cause of equality’ [84] (p. 187). Thus, a fundamental question needs to be asked in terms of how we understand fisheries compliance. A shift needs to take place that moves away from asking ‘how do we increase

compliance with rules’ to ‘how do we minimise harm’. This will then shift fisheries policies away from a sole reliance on law enforcement to a more integrated approach that recognises the importance of legitimacy in the *formulation* of law. Further, these policies need to integrate with broader socio-economic priorities that highlight a reduction of harm more generally, and secure fishers’ livelihoods—in their own right.

## Acknowledgements

Financial assistance for conducting this research on small-scale fisheries compliance is gratefully acknowledged to the following: the Norwegian–South African regional cooperation agreement, the South Africa–Netherlands Research Programme on Alternatives to Development and the South African National Research Foundation. The opinions expressed are those of the author and are not necessarily to be attributed to the organisations above. I would also like to acknowledge comments from Merle Sowman, Jesper Raakjær, Stig Gezelius, Maarten Bavinck, Han van Dijk, Elrena van der Spuy, and Lance van Sittert on previous drafts of this paper.

## References

- [1] Food and agriculture organisation (FAO). The state of world fisheries and aquaculture. Rome: FAO; 2002.
- [2] Hardin G. The tragedy of the commons. *Science* 1968;162:1243–8.
- [3] Schlager E. Rationality, cooperation, and common pool resources. *Science* 2002;45(5):801–19.
- [4] Sutinen JG, Rieser A, Gauvin JR. Measuring and explaining non-compliance in federally managed fisheries. *Ocean Development and International Law* 1990;21:335–72.
- [5] McCay BJ, Acheson JM, editors. The question of the commons: the culture and ecology of communal resources. Tucson: University of Arizona Press; 1987.
- [6] Ostrom E. *Governing the commons: the evolution of institutions for collective action*. Cambridge: Cambridge University Press; 1990.
- [7] Ostrom E. Collective action and the evolution of social norms. *The Journal of Economic Perspectives* 2000;14(3):137–58.
- [8] Dietz T, Ostrom E, Stern PC. The struggle to govern the commons. *Science* 2003;302(5652):1907–18.
- [9] Tyler TR. *Why people obey the law*. Princeton, NJ: Princeton University Press; 2006.
- [10] Gezelius S. Regulation and compliance in the Atlantic fisheries: state/society relations in the management of natural resources. Dordrecht: Kluwer Academic Publishers; 2003.
- [11] Zaelke D, Kaniaru D, Kruzikova E, editors. *Making law work: environmental compliance and sustainable development*. London: Cameron May; 2005.
- [12] Sutinen JG, Anderson P. The economics of fisheries law enforcement. *Land Economics* 1985;61:387–97.
- [13] Anderson LG, Lee DR. Optimal governing instruments, operation level, and enforcement in natural resource regulation: the case of the fishery. *American Journal of Agricultural Economics* 1986;68(3): 678–90.
- [14] Raakjær J. An analytical framework for studying: compliance and legitimacy in fisheries. *Marine Policy* 2003;27(425):432.
- [15] Hatcher A, Jaffry S, Thebaud O, Bennett E. Normative and social influences affecting compliance with fishery regulations. *Land Economics* 2000;76(3):448–62.

- [16] Gezelius S. Do norms count? State regulation and compliance in a Norwegian fishing community. *Acta Sociologica* 2002;45:305–14.
- [17] Hønneland G. Compliance in the Barents Sea fisheries. How fishermen account for conformity with rules. *Marine Policy* 2000;24:11–9.
- [18] Kuperan K, Sutinen JG. Blue water crime: deterrence, legitimacy, and compliance in fisheries. *Law and Society Review* 1998;32(2): 309–37.
- [19] Sutinen JG, Kuperan K. A socio-economic theory of regulatory compliance. *International Journal of Social Economics* 1999; 26(1;2;3):174–93.
- [20] Kuperan K, Abdullah NMR, Susilowati I, Siason IM, Ticao C. Enforcement and compliance with fisheries regulations in Malaysia, Indonesia, and the Philippines. Malaysia: Department of Natural Resource Economics, University Pertanian; 1997 Research report.
- [21] McKinlay JP, Millington PJ. Fisher obligations in co-managed fisheries: the case for enforcement. In: Shotton R, editor. *Use of property rights in fisheries management*. Rome: FAO; 2000.
- [22] Raakjær J, Mathiesen C. Important factors influencing rule compliance in fisheries: lessons in Denmark. *Marine Policy* 2003;27: 409–16.
- [23] Taylor I, Walton P, Young J. *The new criminology*. London: Routledge; 1973.
- [24] Barton A, Corteen K, Scott D, Whyte D. Introduction: developing a criminological imagination. In: Barton A, Corteen K, Scott D, Whyte D, editors. *Expanding the criminological imagination: critical readings in criminology*. Devon: Willan Publishing; 2007. p. 1–14.
- [25] White R. Environmental issues and the criminological imagination. *Theoretical Criminology* 2003;7(4):483–506.
- [26] South N. A green field for criminology? *Theoretical Criminology* 1998;2(2):211–33.
- [27] Lynch MJ, Stretsky PB. The meaning of green: contrasting criminological perspectives. *Theoretical Criminology* 2003;7(2): 217–38.
- [28] Beirne P, South N, editors. *Issues in green criminology: confronting harms against environments, humanity and other animals*. Devon: Willan Publishing; 2007.
- [29] Halsey M. Against 'green' criminology. *British Journal of Criminology* 2004;44:833–53.
- [30] Halsey M. Environmental crime: towards an eco-human rights approach. *Current Issues in Criminal Justice* 1997;8(3):217–42.
- [31] White R. Criminality, risk and environmental harm. *Griffith Law Review* 1999;8(2):235–57.
- [32] South N. The 'corporate colonisation of nature': bio-prospecting, biopiracy and the development of green criminology. In: Beirne P, South N, editors. *Issues in green criminology: confronting harms against environments, humanity, and other animals*. Devon: Willan Publishing; 2007. p. 230–47.
- [33] White R. Green criminology and the pursuit of social and ecological justice. In: Beirne P, South N, editors. *Issues in green criminology: confronting harms against environments, humanity, and other animals*. Devon: Willan Publishing; 2007. p. 32–54.
- [34] Sowman M. Subsistence and small-scale fisheries in South Africa: a ten year review. *Marine Policy* 2006;30(1):60–73.
- [35] Schumann S, Macinko S. Subsistence in coastal fisheries policy: what's in a word? *Marine Policy* 2007;11; 31(6):706–18.
- [36] Bavinck M. Understanding fisheries conflicts in the south—a legal pluralist perspective. *Society and Natural Resources* 2005;18: 805–20.
- [37] Food and agriculture organisation(FAO). *Increasing the contribution of small-scale fisheries to poverty alleviation and food security. Technical Guidelines for Responsible Fisheries* 2005;10.
- [38] Ziegler J. *The Right to Food*. Interim report of the special rapporteur of the commission on human rights on the right to food, in accordance with General Assembly resolution 58/186; 2004.
- [39] Berkes F, Mahon R, McConney P, Pollnac R, Pomeroy R. *Managing small-scale fisheries: alternative directions and methods*. Ottawa: IDRC; 2001.
- [40] Crosoer D, van Sittert L, Ponte S. The integration of South African fisheries into the global economy: past, present and future. *Marine Policy* 2006;30:18–29.
- [41] Ghee LT, Valencia MJ. *Conflict over natural resources in South-east Asia and the Pacific*. Singapore: United Nations University Press; 1990.
- [42] A discussion paper for the ACFR working party on small-scale fisheries: draft prepared for the ACFR working party meeting October 2003, Bangkok, Thailand, 2003.
- [43] Assessment of the world food security situation. Report CFS: 99/2. Prepared for the 25th session of the committee on world food security, 31 May–2 June, Rome, Italy, 1999.
- [44] Buzan B, Waever O, de Wilde J. *Security: a framework for analysis*. Boulder: Lynne Rienner Publishers; 1998.
- [45] United nations development programme, UNDP. *Human development report—1994*. Oxford, New York: University Press; 1994.
- [46] Commission on human security. *Human security now*. New York: United Nations; 2004.
- [47] Thakur R, Newman E. Introduction: non-traditional security in Asia. In: Thakur R, Newman E, editors. *Broadening Asia's security discourse and agenda: political, social, and environmental perspectives*. Tokyo: United Nations University Press; 2004. p. 1–16.
- [48] Myers N., *Environmental security: what's new and different?* Background paper for the Hague conference on environment, security, and sustainable development, 9–12 May, 2004, The Hague, The Netherlands, 2004.
- [49] Elliott L. Regional environmental security: pursuing a non-traditional approach. In: Tan TH, Boutin JDK, editors. *Non-traditional security issues in South east Asia*. Singapore: Select Publishing; 2001. p. 438–67.
- [50] Najam A. Sustainable development and human security: lessons from South Asia. In: Thakur R, Newman E, editors. *Broadening Asia's security discourse and agenda: political, social and, environmental perspectives*. Tokyo: United Nations University Press; 2004. p. 147–73.
- [51] Haque MS. How critical is 'environmental security' as a non-traditional security issue in North-east Asia? In: Thakur R, Newman E, editors. *Broadening Asia's security discourse and agenda: political, social, and environmental perspectives*. Tokyo: United Nations University Press; 2004. 174–195.
- [52] Thakur R, Newman E, editors. *Broadening Asia's security discourse and agenda: political, social, and environmental perspectives*. Tokyo: United Nations University Press; 2004.
- [53] Pauly D. Major trends in small-scale marine fisheries, with emphasis on developing countries, and some implications for the social sciences. *MAST* 2006;4(2):22–74.
- [54] Degnbol P, Gislason H, Hanna S, Jentoft S, Nielsena JR, Sverdrup-Jensen S, et al. Painting the floor with a hammer: technical fixes in fisheries management. *Marine Policy* 2006;30:534–43.
- [55] Kooiman J, Bavinck M, Jentoft S, Pullin R, editors. *Fish for life: interactive governance for fisheries*. Amsterdam: Amsterdam University Press; 2005.
- [56] Johnson D. Editor. Special issue of MAST exploring the role of social science in fisheries management. *MAST* 2006, 4(2).
- [57] Acheson JM. Institutional failure in resource management. *Annual Review of Anthropology* 2006;35:117–34.
- [58] Chuenpagdee R, Degnbol P, Bavinck M, Jentoft S, Johnson D, Pullin R, et al. Challenges and concerns in capture fisheries and aquaculture. In: Kooiman J, Jentoft S, Pullin R, Bavinck M, editors. *Fish for life: interactive governance for fisheries*. Amsterdam: Amsterdam University Press; 2005. p. 25–37.
- [59] Berkes F, Colding J, Folke C. *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge: Cambridge University Press; 2003.
- [60] Zaelke D, Stilwell M, Young O. What reason demands: making law work for sustainable development. In: Zaelke D, Kaniaru D, Kruzikova E, editors. *Making law work: environmental compliance and sustainable development*. London: Cameron May; 2005. p. 29–51.

- [61] Sowman M, Cardoso P. Fisheries and food security in the Benguela current large marine ecosystem region. Environmental evaluation unit, University of Cape Town; in prep.
- [62] Republic of South Africa. Constitution of the Republic of South Africa 1996; Act 108 of 1996.
- [63] Witbooi E. Law and fisheries reform: legislative and policy developments in South African fisheries over the decade 1994–2004. *Marine Policy* 2006;30(1):30–42.
- [64] Van Sittert L, Branch G, Hauck M, Sowman M. Benchmarking the first decade of post-apartheid fisheries reform in South Africa. *Marine Policy* 2006;30(1):96–110.
- [65] Van Sittert L. The tyranny of the past: why local histories matter in the South African fisheries. *Ocean and Coastal Management* 2003;46:199–219.
- [66] Hauck M, Sowman M. Coastal and fisheries co-management in South Africa: is there an enabling legal environment. *South African Journal of Environmental Law and Policy* 2005;12(1):1–21.
- [67] Hauck M, Kroese M. Fisheries compliance in South Africa: a decade of challenges and reform 1994–2004. *Marine Policy* 2006;30(1):74–83.
- [68] Isaacs M. Small-scale fisheries reforms: expectations, hopes, and dreams for “a better life for all”. *Marine Policy* 2006;30(1):51–9.
- [69] Van Sittert L. Leviathan Bound: fisheries reform in South Africa. In: Lemon A, Rogerson CM, editors. *Geography and economy in south africa and its neighbours*. Hampshire: Ashgate; 2002. p. 45–62.
- [70] Omari N. Legal pluralism in environmental management: informal rules and non-compliance in the Karbonkelberg marine protected area: MPhil in Environmental Management, Department of Environmental and Geographical Sciences, University of Cape Town, 2007.
- [71] Hauck M. Non-compliance in small-scale fisheries: a threat to security? In: Beirne P, South N, editors. *Issues in green criminology: confronting harms against environments, humanity and other animals*. Devon: Willan Publishing; 2007. p. 270–89.
- [72] African national congress (ANC). *Reconstruction and development programme: a policy framework*, 1994.
- [73] Department of environmental affairs and tourism (DEAT). *White paper on marine fisheries policy for South Africa*, 1997.
- [74] Britz P.J., Sauer W.H.H., Mather D., Oellerman L.K., Cowley P.D., Ter Morshuizen L., and Bacela N., Baseline study of the utilisation of living marine resources in the Eastern Cape Province, Department of ichthyology and fisheries science, Rhodes University, South Africa, 2001.
- [75] Wynberg R. A review of key issues facing the management of marine and coastal systems and resources in South Africa. Paper prepared for Department of environmental affairs and tourism, Pretoria, South Africa, 2001.
- [76] Halsey M, White R. Crime, ecophilosophy and environmental harm. *Theoretical Criminology* 1998;2(3):345–71.
- [77] Hauck M, Sowman M, Russell E, Clark BM, Harris JM, Venter A, et al. Perceptions of subsistence and informal fishers in South Africa regarding the management of living marine resources. *South African Journal of Marine Science* 2002;24:463–74.
- [78] Adger WN, Brown K, Fairbrass J, Jordan A, Paavola J, Rosendo S. Governance for sustainability: towards a ‘thick’ analysis of environmental decisionmaking. *Environment and Planning* 2003;35:1095–110.
- [79] Scraton P, Chadwick K. The theoretical and political priorities of critical criminology. In: Stenson K, Cowell D, editors. *The politics of crime*. London: Sage; 1991.
- [80] Hauck M, Sowman M, editors. *Waves of change: coastal and fisheries co-management in South Africa*. Cape Town: University of Cape Town Press; 2003.
- [81] Dietz T, Dolšak N, Ostrom E, Stern PC. The drama of the commons. In: Ostrom E, Dietz T, Dolšak N, Stern PC, Stonich S, Weber EU, editors. *The drama of the commons*. Washington: National Academy Press; 2002. p. 3–36.
- [82] Roncin N, Bailly D, Raux P. In: Matsuda Y, Yamamoto T, editors. *Determinants of fishermen’s compliance—lessons from a coastal fishery in Biscay Bay. What are responsible fisheries?* In: 12th Biennial conference, 2004.
- [83] Dixon B. Exclusive societies: towards a critical criminology of post-apartheid South Africa. *Society in transition* 2001;32(2):205–27.
- [84] Dixon B. Development, crime prevention, and social policy in post-apartheid South Africa. *Critical Social Policy* 2006;26(1):169–91.