Sustainable management through improved governance in the game industry

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The South African game farming industry has grown exponentially since the 1960s and makes a significant contribution to South Africa's GDP. Recently, a number of challenges to the sustainability of the industry have emerged. This has led to concerns by environmental NGOs, academics and government officials about land degradation, hybridization, inbreeding, disrupted ecosystem processes, social impacts, and economic feasibility. Game farmers have raised concerns about the industry's governance, in particular the lack of consultation, inconsistent regulation, lack of capacity and leadership, and indecisiveness in government. The root of the problem lies in the incorrect and untested assumption that current science, policy and governance systems are adequate to achieve the goals of sustainability, leading to a top-down approach to regulation and the absence of adaptive management and co-learning. In this paper, we outline the ecological, social and economic benefits of sustainable game farm management. We propose an alternative approach to responsible management and better governance, based on the principles of adaptive co-management and co-regulation. We put forward a learning-and-process model starting with knowledge generation, awareness raising, knowledge sharing, learning, trust building, policy adaptation, monitoring and, ultimately, assessment and certification. The process moves from ineffective regulation to co-regulation, and the capacity to govern as well as the ecosystem's capacity to produce lasting services increases steadily as the process evolves. We suggest that the process outlined in the model should be guided by independent facilitators and culminate in a certification system for sustainably managed game farms.

Keywords: certification, economic development, game farming, sustainability, wildlife ranching.

INTRODUCTION

South Africa's game industry is expanding rapidly. The game industry covers almost a third of South Africa's grazing land and is growing rapidly (Bothma 2002) with game numbers increasing from 575 000 in 1960 to almost 19 million in 2007 (Carruthers 2008). Total turnover from game auctions has increased from less than R10 million (US$3.6 million at a mean exchange rate of 2.76) in 1991 to more than R100 million (US$9.5 million at a mean exchange rate of 10.53) in 2002 (http://www.oanda.com/currency/historical-rates), where after it dropped off slightly (Carruthers 2008). Hearne & McKenzie (2000) argue that this phenomenal growth is driven by strong local and international markets within a stable political and legal framework.

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According to Lindsey *et al.* (2007) and Smith & Wilson (2002) the game industry is regarded as an important contributor to biodiversity conservation and job creation, but other authors point to problems in the industry (Luck 2005; Van der Merwe & Saayman 2005; Carruthers 2008). Game farmers are concerned about shortcomings in governance, in particular the weak support and a lack of recognition by the regulating authorities and poor communication between authorities and industry role players (Dry 2006; Malan 2006). The industry is also troubled by the inconsistent application of regulations since there is no single national permit system (Dry 2006). Government and academic concerns, supported by some industry role players, include inbreeding and hybridization; altered population and community structures due to selective hunting; introductions of extralimital species which could become invasive or out-compete native species; negative impacts on ecological processes due to habitat degradation and fragmentation;

waste pollution; poor ethical practices that threaten the integrity of the entire industry; and changes in land use that could impact on the social fabric of farming communities and the well-being of farm workers (Castley *et al.* 2001; Coltman *et al.* 2003; Luck 2005; Lindsey *et al.* 2007; Spear & Chown 2009). The fact that an industry this size has not yet been successful in formulating a cohesive vision and strategy, and has, up until present, been unable to negotiate a political space for itself, suggests major governance shortcomings in the industry.

In Zimbabwe, legislative reforms through the Natural Resources Act of 1941, followed by the Parks and Wildlife Act of 1975, devolved the authority for conservation to landowners and communities. The combination of collective action by farmers and government transformed the way agricultural land was being managed. Although environmental legislation in Zimbabwe is criticized by some for its negative social impacts (Bowyer-Bower 1996) and contemporary Zimbabwe is far from a role model for cooperation between farmers and government, the earlier achievements of legislative reforms in Zimbabwe should be acknowledged. Farming communities took responsibility for managing their ecosystems through co-management and devolution of authority, with positive outcomes for ecosystem services (Child 1995).

Corporate role players such as the game industry have a key role to play in the world's transition towards sustainability (Adams & Jeanrenaud 2008), and the earlier Zimbabwe example shows that this is possible. Although there is vigorous debate over the meaning and interpretation of sustainability (Redclift 2006), we adapt the definition of Groom *et al.* (2006) to encompass three integrated concepts: (a) the intrinsic values of the environment are respected in the way natural resource use is conducted; b) the role of ecosystem services in supporting human well-being is respected; and c) all role players ensure that economic benefits are derived from the income of nature's capital and not the capital *per se.* We contend that, by this definition, the industry is currently not sustainable. The problem lies in an inappropriate governance model, rooted in the flawed assumption that current science and regulatory framework are adequate and that top-down regulation is therefore appropriate. These concerns have lead to calls for further research, co-management, and the development of sustainability grading or rating systems for the wildlife ranching and wildlife tourism sectors (Fourie *et al.* 2004; Child & Wall 2009).

Objectives

We wish to address concerns about sustainability in the game industry by proposing a framework for co-regulation culminating in a scientifically defensible certification system. Although the game industry is sometimes separated into game farm and game ranch enterprises (Bothma 2002), we discuss these in the same context and use the terms game farm/game farmer to apply to both types of enterprises. Our purpose is to promote debate and discourse, make proposals for future action, and ultimately engage in a process leading towards sustainability as advocated by the Forum for the Future (Adams & Jeanrenaud 2008), as opposed to developing indicators and setting and pursuing targets as advocated by UNCSD (2001).

In this context we have three objectives: (a) promote greater consensus on the meaning and implications of sustainability in the game industry; (b) make progress towards improved governance by proposing a legitimate sustainability certification system for the game industry; and c) propose mechanisms for implementing such a system.

Approach

We view transformation to sustainability as an adaptive process which, through knowledge sharing, awareness raising, trust building and, ultimately, certification, will lead to responsible co-management. Our departure point is that the process of transformation towards sustainability in the game industry should be voluntary and collaborative, and that an appropriate certification system will ultimately lead to incentives for responsible management (Child & Wall 2009). We believe that the industry must work in partnership with various government departments as law enforcement is not a feasible option due to the lack of capacity, ineffective and inconsistent legislation, different mandates and priorities of responsible government departments (*e.g.* Agriculture, Conservation, and their national and provincial competencies) and many loopholes. Many lessons can be learnt from good practice in other industries (*e.g.* the forestry industry), where a system based on evidence of good practice rather than mere opinion has been developed, tested, refined and implemented following adaptive management principles.

The approach we advocate is both output and process focussed. We advocate an iterative process of knowledge generation and sharing, learning, trust building and policy adaptation that has to precede the development of a certification system. We believe that a clear set of measurable certification criteria will play an important clarification and information sharing function. This will educate all role players about the requirements for sustainability as well as shortcomings in their own enterprises and those of others.

BENEFITS OF RESPONSIBLE GAME FARM MANAGEMENT

Ecological benefits

It is generally assumed that game farming is a more sustainable form of land use than livestock farming or crop production, particularly under scenarios of climate change (Erikssen & Watson 2009; Lindsey *et al.* 2009) due to the differential disturbance created by species with different feeding strategies and body sizes, and the fact that indigenous wildlife has co-evolved with African vegetation. The responsible management of soil fertility, vegetation cover to trap moisture and sediment, and appropriate wildlife densities and species mixes (Grossman *et al.* 1999; Van Rooyen 2002; Coetzee 2006) can contribute to biodiversity conservation at the population, community, landscape and regional levels (Gallo *et al.* 2009). This increases the capacity of the ecosystem to continue providing services and prevents the costs of degradation, restoration and repair (O'Farrell *et al.* 2009). Responsible management not only benefits provisioning services such as wildlife production, but also underpins supporting services such as the maintenance of keystone species and processes that are important at the landscape level such as fire and seed dispersal of forage trees and shrubs (Kerley *et al.* 1996; Coetzee 2005).

Responsible management improves the genetic health of wildlife populations by preventing repeated inbreeding of fenced-off populations (Du Toit *et al.* 2002; Corlatti *et al.* 2009; Hayward & Kerley 2009). Prevention of in-breeding not only contributes to the maintenance of the genetic fitness of the metapopulation but also to the viability and production capacity of game populations. Fragmented small game farms should therefore be discouraged and the conservancy approach is advocated (Lindsey *et al.* 2009). By removing internal fencing the reintroduction of the full range of indigenous mammals is possible, thereby increasing the value of wildlife enterprises through *e.g.* hunting and ecotourism and aligning game ranches with conservation objectives. The removal of internal fences could also allow for more profitable land uses owing to economies of scale; increased land value and other social political benefits (Lindsey *et al.* 2009). Solutions such as bridges or tunnels to enable migration (Corlatti *et al.* 2009) are only partially successful and policy solutions therefore need to be sought to encourage the aggregation of farms into *e.g.* conservancies. At the same time, prevention of genetic contamination such as hybridization between different subspecies or genotypes is necessary to preserve genetic diversity (Coltman *et al.* 2003; Hayward & Kerley 2009).

Although each game enterprise is unique with a different suite of objectives and expectations, record-keeping and monitoring are critically important tools for responsible game farming (Bothma & Van Rooyen 2002; Lynam & Stafford Smith 2004). We therefore advocate a cautious adaptive management approach, based on knowledge sharing and monitoring of multiple objectives to ensure sustainable utilization of natural resources (Esler *et al.* 2006).

Social benefits

The social benefits of responsible management impact directly on the sustainability of any game enterprise. Like the ecological benefits, social benefits are spread beyond the boundaries of the game ranch (Els 2002; Van den Berg 2007). Investing in the development of skills and capacity building in surrounding rural communities will eventually benefit the game farmer (Els 2002). The development of guiding, game guard work, rehabilitation, fire fighting, problem plant control, fencing and other skills have social as well as ecological benefits as these skills and their appropriate application are all an essential part of responsible game farm management (Els 2002; Du Plessis 2007; Van den Berg 2007). Skills development is not limited to manual labour alone but extends to professional services such as veterinary scientists, ecologists, architects, landscape architects and environmental scientists. A 2006 survey of seven private game reserves in the Eastern Cape province, South Africa (Sims-Castley *et al.* 2006) found that average salaries increased by a factor of 4.8, the average number of employees per private game reserve increased 4.5 times, and

the average wage bill, excluding intangible benefits such as training, increased 32-fold, compared to similar livestock farms. Some game farmers are also leading the way in forming business and benefit sharing partnerships with local communities, *e.g.* the case of Conservation Corporation at Phinda (http://www.ccafrica.com/conservation-1-id-2-1).

There is, however, a trade-off in the conversion from livestock farming to game farming. Farmer associations and rural sports clubs have declined significantly as new private reserves occupy substantially larger areas than former stock farming enterprises. Traditional stock farming enterprises neighboring private reserves have the perception that the increase of medium and large predators will lead to greater stock losses. The direct impacts of problem animal management, disease management and poaching are best dealt with on a landscape scale, and by involving all of the stakeholders within that landscape (Du Toit 2002; Els 2002; Coetzee 2005). By establishing responsible co-operative management relationships with neighbours the threats of floods, fires, predation, disease and poaching can be jointly managed.

Economic benefits

Sustainable income is directly related to, and dependent on, the environmental benefits of responsible management (Nortje 2007a). There are numerous cases where poor environmental management has resulted in severe landscape degradation and resultant financial collapse in the game farm enterprise (Van Zyl & Sartorius von Bach 2002; Lindsey *et al.* 2007). A system that is responsibly managed will be more attractive to visiting tourists and, because of the financial benefits of responsible management, the game farmer will be in a better position financially to provide facilities that meet required industry standards. Responsible game ranch management not only benefits the individual farmer, but also the country as a whole by stimulating the economy through job creation and foreign income through the economic multiplier effect. Eastern Cape private game reserves were estimated to contribute R180 million (US$21.4 million at the average 2009 exchange rate of R8.40/US$, www.oanda.com) to the provincial economy (Sims-Castley *et al.* 2006). In addition, the cost of floods, droughts and fire, typical consequences of ecosystem degradation, is reduced (Millennium Ecosystem Assessment 2005).

AN OPERATIONAL MODEL TO PROMOTE RESPONSIBLE MANAGEMENT

Inspired by the operational models of Knight *et al.* (2006) and Cowling *et al.* (2008) for the implementation of conservation plans and safeguarding ecosystem services, respectively, we advocate an adaptive co-management approach, *i.e.* a process 'by which institutional arrangements and ecological knowledge are tested and revised in a dynamic, ongoing, self-organized process of learning-by-doing' (Olsson *et al.* 2004a). Good practice models that function as blueprints seldom work because of diverse contexts and can restrict innovation, limit adaptation and reduce the ability for agencies to deliver (Manela & Moxley 2002). The current regulatory approach has been problematic for the game industry because it is too rigid and does not cater for the varied needs of the game industry, nor allows for knowledge sharing and learning, and so leaves little room for adaptation and experimentation. Learning-and-process approaches leading to co-regulation are therefore more appropriate (Pahl-Wostl 2009).

The ultimate goal is developing the capacity of all actors for responsible game ranch management. Our assumptions are that the capacity for responsible management is developed over time through successive steps, from knowledge generation, communication and knowledge sharing, awareness raising, leadership and trust building, policy adaptation, monitoring, certification, and, ultimately, sustainable management. In our model, the capacity for governance, as well as the ecosystem's capacity to produce lasting services, steadily increases as the system evolves from ineffective regulation to co-regulation. Feedback loops are constantly created to promote learning, and the cycle is continuous through on-going communication (Fig. 1). There is no short-cut to co-regulation and the path from unsustainable to sustainable management will take several years or even decades to complete as it contains significant obstacles. The model is an essential starting point and should be superseded by more detailed operational models to make practical progress.

Knowledge generation

In the sustainable management pathway, knowledge is generated through combining different knowledge systems. Academic scholars have much to offer, but informal management knowledge held by game industry professionals should

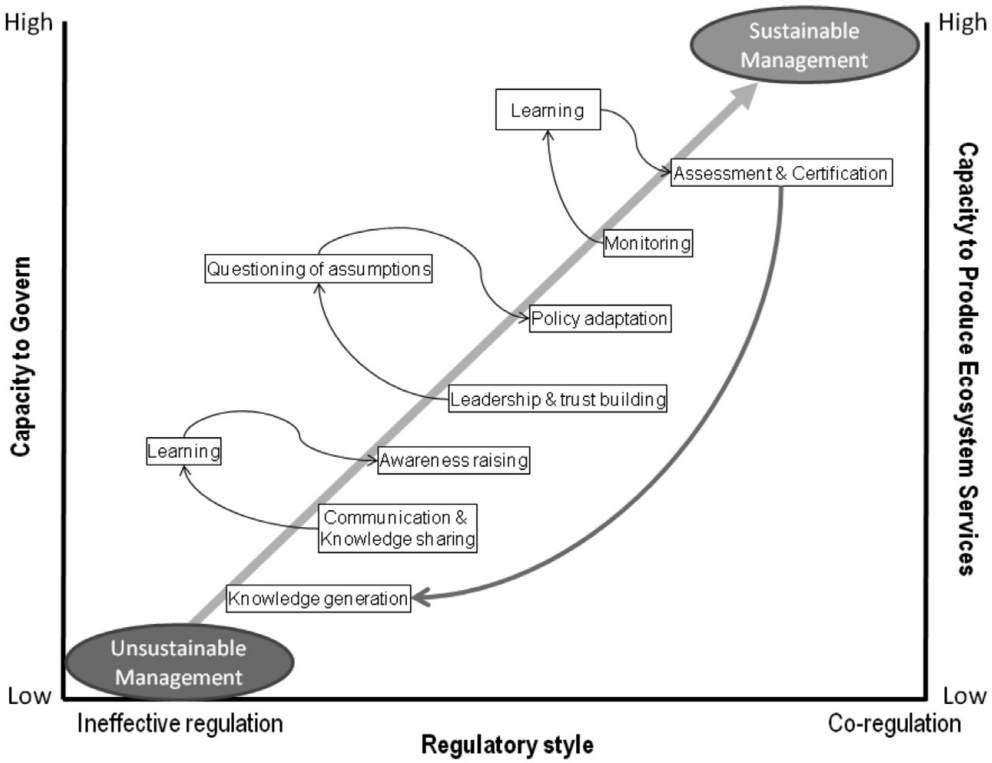

Fig. 1. A conceptual model for promoting responsible management in the game industry. Sustainable management is achieved through a step-wise process, starting with knowledge generation, communication and knowledge sharing, and ending with assessment and certification. Learning and questioning of assumptions act as feedback loops. The regulatory style (*x*-axis) progresses from ineffective, top-down regulation to co-regulation. In the process, the capacity for governance (*y*-axis) as well as the ecosystem's capacity to produce services (alternative *y*-axis) increases. In our view, the system is currently in the lower bottom left quadrant.

be recognized. Scientific knowledge and informal knowledge need to be combined, questioned and tested, and both types of knowledge need to be respected for their potential contributions (Pahl-Wostl 2009). Game farmers, government officials and scientists need to value each others' contributions to the collective knowledge base. Many game farmers have first-hand knowledge of the practical challenges of framing with wildlife and have experimented with techniques such as game capture, veterinary practices, animal holding facilities, national and international markets for wildlife and wildlife products, safe transportation and practical nature tourism. Government conservation and agriculture officials tend to have good knowledge of ecosystem management, vegetation and animal monitoring, soil conservation and legislation and policies. The value of monitoring and certification in generating new knowledge and facilitating shared learning should not be underestimated (Ramtesteiner & Simula 2003).

Communication, awareness raising and shared learning

All role plays should be encouraged to participate in the development and dissemination of information, technical resources and tools. These should guide good practice and move discoveries and development from research into the field of practice and implementation (Scheirer 1996) and should include good practice operating procedures, case studies, templates and checklists to monitor implementation (Manela & Moxley 2002). his could include a website since providing good IT infrastructure is considered a critical factor influencing the transfer of best practices now and in the future (Jarrar & Zairi 2000). It should be understood, however, that IT infrastructure is useful but not the panacea for communication, awareness raising and shared learning (Pfeffer & Sutton 1999). Information should also be transferred through newsletters, seminars, forums, game auctions and workshops to facilitate experience sharing and

creating a community of practice and a collaborative learning culture. Creating a culture of shared learning and information exchange can also be achieved through the promotion of wildlife manager associations and cooperatives. Collaborative action research projects requiring participation in fieldwork, audits, and field and desktop surveys for implemented best practices can be considered (Whyte 1989). Communication is the catalyst for the entire process (Wicks & Reason 2009), and therefore the model contains a continuous feedback loop between certification and knowledge generation.

Awareness raising of good practices will be difficult to realize without expert facilitators (Jarrar & Zairi 2000). It is therefore vital to increase stewardship and extension service capacity to act as 'bridging institutions' between academics, government and practitioners (Chapin *et al.* 2009). Extension personnel must thus be trained to identify and appreciate the inhibitors and obstacles to managing and transferring best practices, be they cultural, institutional, psychological, knowledge-related, management-related or governance-related (Jarrar & Zairi 2000). Stewardship and extension must be seen as collaborative knowledge sharing, research and development underpinned by expert facilitation to promote learning, rather than an expert top-down approach of transferring knowledge (Cowling *et al.* 2008).

Leadership and trust building

It is essential for all actors to show leadership to promote the progression towards co-regulation. Leaders realize that their own knowledge is not sufficient to manage complex systems, act as neutral 'knowledge brokers', and develop social networks for knowledge exchange. Leaders communicate vision, build relationships between all actors, and act inclusively to inspire others towards transformation (Olsson *et al.* 2004a). Leadership requires the willingness amongst leaders to share management power and authority, and allow stewardship organizations to take joint responsibility which shifts the focus from conflict to a shared vision (Barthel *et al.* 2005). In the process, trust will be built which will facilitate dialogue instead of one-upmanship (Dennis 2009). The current situation, in relation to the game industry, is that leaders in the industry and in government do not act in the interest of the industry as a whole, due to the lack of an agreed collective vision. The process of assessment and certification can be a catalyst for knowledge sharing, trust building and learning, and can promote economic incentives for responsible management.

Policy adaptation

The role of government includes reviewing and refining policies which requires the long term political commitment and involvement of all actors to move towards co-regulation (Olsson *et al.* 2004b). Governments can empower people to manage their resources and lessons can be learned from Zimbabwe where co regulation empowered self forming groups of farmers to regulate themselves up until the early 1990s (Child 1995; Mandondo 2000), combining the strengths of 1) private ownership and market access at the micro level, 2) collective regulation and 3) national level arrangements which allowed for legal recourse, with quality extension and education in support of landholders. In the United Kingdom, wildlife is given value to property owners or is co-managed by private and public entities and public funds compensate landowners who modify their land in order to benefit the environment.

As a first step, a thorough review of current regulatory frameworks affecting the game industry is required to identify strengths and weaknesses, contradictions and incompatibilities. Obstacles to co-regulation need to be identified and collectively addressed. Although the National Environmental Management: Biodiversity Act (Act no. 10 of 2004) allows for co-regulation, government does not appear to have the capacity to put this into practice. A set of operational guidelines and codes of conduct therefore have to be jointly developed by government, industry role players and independent specialists to put substance to the Act. Government needs to acknowledge the contribution of the industry and invest in it, and participation of local and provincial governments in the long-term financing and management of programmes is also essential.

Monitoring

Monitoring in social-ecological systems serves two purposes: a) to evaluate progress towards a stated goal, and b) to promote social learning (Cundill & Fabricius 2009). In the context of our operational model, the main purpose of monitoring would be to facilitate learning and dialogue on the path to co-regulation. However, the added benefit of evaluation should not be underestimated. Evaluation would allow all actors to assess whether

their stated objectives are being achieved and whether corrective intervention is required. Participatory monitoring (Danielsen *et al.* 2005) is a useful catalyst for responsibility sharing and obtaining the buy-in of all stakeholders, and this implies that the knowledge and information of all actors should be respected and regarded as valid, until proven otherwise. Monitoring provides new and richer information for management (Olsson *et al.* 2004a), and will also promote a better understanding of the challenges and solutions to responsible game farm management, provided that it takes place in a structured way.

Assessment and certification

The traditional approach to natural resource use challenges has been to regulate their use (Holling & Meffe 1996). However, in general these efforts have proved insufficient to reduce either natural resource loss or degradation due to lack of cooperation between role players, a weak knowledge base and differences in understanding of good practice. One option in finding a lasting alternative to measure sustainable management of natural resources, that has proven successful in the forestry industry, is for the development of an assessment and certification system that evaluates mutually-agreed parameters to measure sustainable management. Such a system has five objectives: (a) to act as a market incentive to improve land management and conservation; (b) to improve transparency in the industry, particularly in relation to social and ecological principles; c) to improve market access and share for the products and services of such management; d) to improve acceptance of the principles of sustainability amongst industry stakeholders; e) to find an alternative for increased yet ineffective regulation that jeopardizes sustainability (Kiker & Putz 1997; Rametsteiner & Simula 2003; Child & Wall 2009). Certification is a voluntary process and takes place by assessing the effect of management activities against standards agreed as significant and acceptable to stakeholders and is overseen by independent third party organisations. This will assure the public that a certification process has entailed independent and professional judgement, and will protect the industry against weak governance and accusations by lobby groups (Child & Wall 2009).

The forest industry has effectively implemented and entrenched a successful forest certification system, which was first launched in 1995 as the Forest Stewardship Council (FSC). The FSC has certified in excess of 100 million ha since its inception and today the FSC label can be seen on many forest products across the world (Cashore *et al.* 2004). More recently, proposals have been put forward to take the certification concept to a higher level, through a process termed 'landscape labeling' (Ghazoul *et al.* 2009) which combines the characteristics of payments for ecosystem services (PES) programmes with those of forest certification. The 'label' identifies a landscape as valuable due to the ecosystem services it provides, and recognizes managers for their efforts. The advantages are that managers gain access to niche markets and receive market recognition. Although it is generally accepted that certification programmes will proliferate in the near future, the concept of certification of operational management within the game industry has only recently been mooted (Fourie 2004; Lindsey *et al.* 2007; Child & Wall 2009). The Game Rangers Association of Africa has made considerable progress with the development of their Protected Areas Management System (PAMS) and the Protected Areas Stewardship Council (PAS) through which they hope certification for best management practices could be attained (Clark *et al.* 2009). This led to the development of a conservation management standard for the certification of natural areas, such as private game reserves, by SGS – a Swiss-based inspection, verification, testing and certification company (http://www.ch.sgs.com) (SGS Standard 2005). Although an assessment tool for game farms has been established it is still in its pilot stages and has not yet been widely tested or implemented.

A good assessment system needs four key ingredients: (a) the approach to auditing and certification should adhere to generally accepted international auditing requirements, such as those defined by ISO 19011; (b) the approach should include a standard which fully encompasses the definition of sustainable management, and involves an independent third party who assesses the quality of management relative to pre-defined criteria and standards (Rametsteiner & Simula 2003); c) it should be simple and cost-effective to apply (Child & Wall 2009); and d) there should be an acceptable and unambiguously measurable set of metrics and standards to monitor and assess progress towards sustainability.

Auditing relies on a number of principles which make the audit an effective and reliable tool in support of management policies and controls,

providing information on which an organization can act to improve its performance. Adherence to these principles is a prerequisite for providing audit conclusions that are relevant and sufficient and for enabling auditors to independently reach similar conclusions in similar circumstances. We highlight the following principles: (a) Ethical conduct – trust, integrity, confidentiality and discretion are essential to the process; (b) Fair presentation – audit findings, conclusions and reports reflect truthfully and accurately the audit activities. Significant obstacles encountered during the audit and unresolved diverging opinions between the audit team and the auditee are reported. Auditors exercise care in accordance with the importance of the task they perform and the confidence placed in them by audit clients and other interested parties. Having the necessary competence is an important prerequisite; (c) Independence – auditors are independent of the activity being audited and are free from bias and conflict of interest. Auditors maintain an impartial perspective throughout the audit process to ensure that the audit findings and conclusions will be based only on the audit evidence; (d) Evidence-based approach – audit evidence is verifiable, and based on samples of the information available, since an audit is conducted during a finite period of time and with finite resources. The appropriate use of sampling is closely related to the confidence that can be placed in the audit conclusions; and e) Learning and information sharing – certification plays a key role in awareness raising, information sharing and knowledge generation, which reinforces responsible management through positive feedback.

THE CHALLENGES OF CO-REGULATION

Co-regulation requires the development of new mindsets amongst all actors, from the current focus on conflict and point-scoring, to dialogue, learning, adaptation and seeking of mutually acceptable solutions. The current weak relations between the industry and government, and government's weak capacity to implement its regulatory frameworks are obstacles, as are the high staff turn-over rates in national and provincial government departments, particularly at middle-management level. This lack of continuity makes it difficult to build trust. Furthermore individual game industry ventures are in essence competing with each other which may prevent them from developing a common vision of a combined future. It is therefore necessary to develop mutually acceptable official guidelines and codes of conduct, to promote cooperation, acceptance of joint responsibility, and a culture of co-learning. The process leading to co-regulation (as described in Fig. 1), which culminates in a certification system driven by independent assessors, could achieve this.

NEXT STEPS AND PRIORITIES

In the preface to an International Wildlife Ranching Symposium held in South Africa, Renecker & Valdez (1994) state the objectives: (a) 'Provide direction, options and guidelines for sustainable use of our wildlife resources'; (b) 'Convey a forum that allows resource users, resource developers, and policy makers to understand the need for evaluation of conservation and wildlife principles within the concept of sustainable development.' These statements might as well have applied to the game industry and not just the Symposium, and it seems that 16–years on we are still far from achieving these objectives. We suggest that knowledge generation, communication, awareness raising, learning, adaptation and, ultimately, action, (Fig. 1) is the path to co-regulation, and that independent parties should facilitate the process due to the history of conflict between the different actors. The game industry fraternity and government needs to find ways of resolving their differences and re-building trust through leadership.

Ultimately, a formalized certification system based on mutually acceptable standards, and implemented by reputable independent facilitators, will create incentives to sustain co-regulation, and would be analogous to the 'mainstreaming' phase in the Cowling *et al.* (2008) model. We suggest that the conservation management standard such as the SGS system could be a useful tool for testing and implementing a co-regulation system in the game industry, and propose that an independent group of specialists, together with government and industry role players, should start developing, testing and refining a set of standards for this purpose.

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