Review

The history of South African inland fisheries policy with governance recommendations for the democratic era

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ABSTRACT

The governance of South Africa's inland fishery resources in the democratic era has lacked a guiding policy, supporting legislation and government capacity based on the social, economic and environmental objectives defined in constitutional legislation. This is ironic, as during the colonial and apartheid eras South Africa had developmentally orientated inland fishery policies with supporting institutions. An overview of the evolution of inland fishery policy in South Africa is provided, beginning with the comprehensive colonial policies to develop Inland Fisheries Divisions and recreational fisheries based on the introduction of alien species. Apartheid-era policies to promote commercial fisheries on dams in the Free State and small-scale fisheries in the former homelands are described. A policy shift in the 1980s saw the provincial nature conservation agencies move away from promoting inland fisheries based on alien species to conserving indigenous fish fauna. This effectively ended a century of state-supported inland fishery development, resulting in a decline in state-supported inland fishery institutions and a policy vacuum which has not been addressed in the democratic era. Customary and traditional small-scale fishing rights and practices have never been recognised in policy and governance arrangements resulting in the progressive marginalisation of these fisheries. The inclusion of the inland fishery mandate into the Fisheries Branch of the newly-formed Department of Agriculture, Forestry and Fisheries in 2009 was a positive move opening the way for the re-establishment of institutional arrangements to promote equity and optimal socio-economic benefit from inland fisheries. The need for an inland fishery policy and institutional capacity aligned with democratic South Africa's development objectives and environmental management policies is motivated. Policy objectives are recommended based on a characterisation of the potential of the inland fishery resource and its user groups, international norms for fishery governance, and consultations with public and private sector stakeholders on appropriate governance and institutional arrangements.

Keywords: inland fisheries, fisheries policy, fisheries governance, recreational fisheries, small-scale fisheries

INTRODUCTION

South Africa's rights-based Constitution (Act 108 of 1996) has guided the formulation of policy and legislation governing the use of the country's natural resources in the democratic era, with rights to water, minerals, land, and marine fishery resources being subject to processes of restitution and reform to address apartheid-era inequalities. While the Marine Living Resources Act (Act 13 of 1998) guided marine fishery reform, the primary environmental acts governing inland aquatic resources (the National Environmental Management Act, Act 107 of 1998; and the National Water Act, Act 36 of 1998) are silent on inland fisheries, providing only generic principles for resource use flowing from the imperatives of the Constitution and international norms for environmental 'good governance'. Thus, while South Africa's environmental legislation is founded upon the principles of sustainable development and equity, no specific social and economic objectives are articulated to guide inland fishery governance.

The only legislation on the use of inland fish resources are rudimentary fishing 'effort control' regulations designed for recreational fishing, which are prescribed in the provincial environmental acts and ordinances. This is problematic, as environmental managers responsible for fishery resources are not provided with guidance on how to manage inland fisheries for optimal social and economic benefit, resulting in potential livelihood development opportunities not being realised and also tensions between various users of the resource. Legally-defined use rights and controls designed for recreational fishing are well-established, but existing legislation does not provide for small-scale fisheries governance requirements including use rights, processes of restitution, resource use rules and recognition of customary practises (small-scale fishing is understood to range from subsistence fishing for food security to artisanal fishing using hand-operated gear such as gill nets or long lines). Fishing for livelihood purposes by poor communities remains a marginalised activity and is often portrayed as 'poaching'. In the absence of a comprehensive policy to guide inland fishery governance, colonial and apartheid-era inequalities of resource access by poor Black communities tend to be perpetuated, and unsustainable fishing practices are becoming more prevalent.

The lack of policy and associated capacity to guide South African inland fishery governance has been highlighted previously (Weyl et al., 2007; McCafferty et al., 2012), with suggestions provided to guide the establishment of appropriate institutional and management arrangements. Based on a case study of the inland fishery potential of the dams in the North-West Province, Weyl et al. (2007) provided recommendations for fishery development based on the productivity of each dam, biodiversity considerations, user group characteristics, and socio-economic objectives – particularly the promotion of rural livelihoods. These authors suggested that the provincial departments of agriculture, with their smallholder/ rural livelihoods development

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Received: 6 October 2014; accepted in revised form 25 August 2015

http://dx.doi.org/10.4314/wsa.v41i5.05
Available on website http://www.wrc.org.za
ISSN 1816-7950 (On-line) = Water SA Vol. 41 No. 5 October 2015

mission, should logically be mandated to promote inland fishery development. This subsequently came into effect through the creation of the Department of Agriculture, Forestry and Fisheries (DAFF) in 2009. Weyl et al. (2007) however cautioned that the provincial agriculture departments did not possess the capacity to promote inland fishery development, and thus considerable institutional capacity building would be required. They concluded by highlighting the need for a comprehensive national policy to guide inland fishery development. Such a policy should be based on a development-orientated co-management approach, and aligned with existing national policies and legislation as well as relevant international agreements and conventions such as the FAO Code of Conduct on Responsible Fisheries, the SADC Protocol on Fisheries and the NEPAD Abuja Agreement on Fisheries and Aquaculture. As inland fisheries are a provincial competency, cooperative institutional arrangements and the harmonisation of provincial ordinances governing inland fishing would be required. McCafferty et al. (2012 p. 339) noted that the development of inland fisheries governance arrangements is constrained by a paucity of information and identified 'an urgent need for research covering the biological, social, economic and governance aspects, if inland fisheries are to be developed in a rational and sustainable manner which promotes South Africa's national policy goals'.

The outdated and incomplete South African inland fishery policy framework is highlighted by comparison to recent normative international fishery governance guidelines, including the FAO's 'Framework for the Development and Management of Inland Fisheries' (Wellcome, 1997), the 'FAO Code of Conduct for Responsible Fisheries' (FAO, 2010) and 'International Guidelines for Securing Sustainable Small-scale Fisheries' (FAO, 2013). The FAO guides adopt a human-rights based approach to fisheries governance with clearly defined social and economic objectives, to address the legacies of disadvantage and marginalisation borne by poor fishing communities.

Recognising this knowledge gap, the Water Research Commission (WRC) funded a scoping study on the development and sustainable utilisation of inland fisheries in South Africa, which aimed to provide a knowledge base to inform the development of policy and institutional arrangements for inland fishery governance (Britz et al., 2015). The project analysed the environmental, social and economic potential of South African inland fisheries and included consultations with relevant government departments, fishery user groups and stakeholders. In this paper flowing from the study, the evolution of inland fisheries policy in South Africa is reviewed; followed by an evaluation of the existing regulatory and institutional framework in terms of modern fishery governance norms and national development objectives. Informed by research and consultations with public and private sector stakeholders, the paper concludes with a set of recommended governance principles and institutional arrangements to inform the development of a South African inland fisheries policy.

Historical background: a development-orientated colonial inland fisheries policy

The development of fisheries policy in South Africa dates back to the 19th Century, when the Cape Colonial Government promulgated the first fishery legislation, and invested in institutions to develop inland and marine fisheries. It is interesting that the colonists' initial focus was not on the development of South Africa's rich marine fishery resource (Thompson, 1913), but on the establishment of traditional British freshwater angling species in the 'tantalisingly empty streams' (Harrison, 1951). Their motivation was articulated by Thompson (1913 p. 121) who wrote: 'The Colonist, especially of British blood, seems unable to finally settle down in a new land until many of the animals and plants that minister to his pleasure or profit in the homeland have followed him: his horse and dog, his beehives and flocks, his fruits, his fish and even his oysters – none are as good in his eyes as those that come from his "ain countrie"'. This strong desire gave rise to a remarkably comprehensive policy of institutional support to develop the country's inland fisheries based on the stocking of alien fish, which remained largely in place for over a hundred years.

The fisheries legislation promulgated by the Cape Colonial legislature in the late 19th Century provided a comprehensive governance framework for inland fisheries development. Act 10 of 1867 provided for 'encouraging the introduction into the waters of this Colony of fishes not native to such waters'. This was followed by Law 21 of 1884, which provided for the introduction of trout, and which was revised and expanded as the Cape Colony Fish Protection Act (Act 15 of 1893). This suite of legislation and subsequent amendments defined fishing rights and areas, prescribed fishing licence fees and criminal sanctions for violations, and provided for research and other measures to promote inland fishery development. The measures included the building of a state hatchery at Jonkershoek outside Stellenbosch under the responsibility of the Department of Agriculture, the appointment of a marine biologist (John D Gilchrist), a bounty on predators such as otters, and resource users' associations such as the Western Game and Trout Establishment Association, later reconstituted as the Piscatorial Society (Anon., 1944; Thompson, 1913; Harrison, 1956). Similar initiatives to establish trout were undertaken in the Eastern Cape and the Natal colony (Thompson, 1913; Anon, 1944, Alletson, 1990). Public sector institutional support was consolidated with the establishment of the Natal Fisheries Board in 1932 (Alletson, 1990) and the Cape Province's Inland Fisheries Division in 1942 (Anon., 1944). As South Africa was now a Union of four provinces, provision for cooperative governance was made in 1942 with the establishment of the Joint Provincial Inland Fisheries Advisory Board (Anon., 1944). Responsibility for inland fisheries in Natal was strengthened with the establishment of the Natal Parks Game and Fish Preservation Board in 1947 which promoted angling access to the general public, establishing three trout hatcheries (Alletson, 1990) and one for bass and other warm-water fish at Nagle Dam near Durban. Thus, from the outset, South African inland fisheries were governed by what may be considered to be 'modern' fishery governance policies and institutions.

Inland Fisheries Division Director, Douglas Hey, articulately summarised the Union's inland fisheries policy vision in 1950. This included the balancing of social, economic and environmental considerations within the department's institutional mandate:

> *The primary object is to develop all inland waters to their maximum productive capacity selecting the most suitable species of fish from the viewpoints of table and sporting qualities. In doing so, there should be a nice balance between the interests of economic fisheries, sport fishing and the natural fauna…The Department is well aware of its obligation to provide well stocked waters for resident anglers and for the attraction of visitors. Care should be taken to preserve the indigenous fish fauna in certain areas for scientific and educational purposes.*
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> Hey (1950) cited in Crass (1986 p. 150)

http://dx.doi.org/10.4314/wsa.v41i5.05
Available on website http://www.wrc.org.za
ISSN 1816-7950 (On-line) = Water SA Vol. 41 No. 5 October 2015

The economic, social and environmental objectives of the inland fisheries policy were explicit, being articulated in the mission of the Joint Provincial Inland Fisheries Advisory Board (Anon. 1944 p. 44):

> *The aim of the Joint Provincial Inland Fisheries Advisory Board is to develop the inland waters of the Union, firstly for economic, and secondly for sporting purposes by the following means:*
> 1. *To take stock of the assets by a thorough survey of all inland waters.*
> 2. *Where it is found that indigenous species of economic value are established, these shall be encouraged and the introduction of exotic fish shall be prohibited.*
> 3. *Where it is found that waters are unstocked or stocked only with inferior species of fish, then the most suitable species of exotic fish shall be introduced.*
> 4. *All waters shall be maintained in as favourable a condition as possible by taking measures to prevent pollution by trade wastes, etc.*
> 5. *The adoption of inland fishery legislation which shall be applicable to all provinces.*

The provincial mandate for inland fisheries development was combined organisationally with the growing need for structures to conserve terrestrial fauna and flora. The Cape Province's 'Inland Fisheries Division' was renamed the 'Department of Nature Conservation' in 1952 (Hey, 1977) and the 'Natal Parks Game and Fish Preservation Board' formed in 1947 later became the 'Natal Parks Board'. Although the Cape and Natal state hatcheries continued to operate in line with the established inland fishery policy, this institutional change arguably sowed the seeds of the later demise of state-supported inland fishery development.

Inland fishery policy shifts from stocking alien fish to conserving indigenous fish fauna

A policy change in the mid-1980s shifted the provincial nature conservation departments' aquatic mission away from the stocking of alien fish species for angling and fishery development purposes, to conserving South Africa's indigenous fish fauna (Hamman, 1986). Arguably, the realignment was overdue as awareness of the impact of alien fish was growing (De Moor and Bruton, 1988; Skelton, 1987), and the breeding and stocking of rivers with alien fish for the promotion of social and economic benefit was not compatible with the mandate of the environmental management agencies. With the policy focus now firmly on conserving the indigenous fish fauna, the alien-based fisheries that the provincial conservation agencies had promoted were now deemed to be problematic from a biodiversity management perspective (Skelton, 1986). From the mid-1980s onwards, the state hatcheries were closed, privatised, or converted to breeding endangered indigenous fish species; legal protection for trout was lifted; and the provincial inland fishery licensing systems largely abandoned, causing an outcry in trout angling circles (Davies, 2002; Rouhani and Britz, 2004).

While this policy and institutional change was consistent with the provincial conservation mandates, it was not accompanied by a policy review to determine how best to govern valuable inland fisheries to achieve social and economic goals – effectively ending a century of state-supported inland fishery development. The stocking of trout and other species was still permitted as a privately funded activity, in waters where the threat to indigenous fauna was deemed to be low, but there was now effectively a policy vacuum on the potential public good benefits of stocking alien fish for inland fishery resource use.

In response, the trout fishing community formed the Federation of Flyfishers of Southern Africa (FOSAF) in 1986, which took on an advocacy role to promote support for the economic and social aspects of flyfishing while supporting biodiversity conservation goals (Bainbridge et al., 1995). FOSAF published a position paper in 1995 which recommended (p. 14) 'the establishment of a zoning system together with a policy framework and management guidelines for the control, conservation and management of aquatic biodiversity resources, in which provision is made for the maintenance of both indigenous as well as alien species.' This recommendation was subsequently incorporated into policy following a protracted engagement (2008–2014) on the 'invasive' status of trout between the trout industry and the Department of Environmental Affairs. The promulgation of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (and subsequent drafts of the 'Alien and Invasive Species' (AIS) regulations) posed a very real threat to the trout fishery, as the Act is silent on the management of the beneficial uses of alien and invasive species, providing only for 'eradication', or 'control' to minimise the spread of an invasive species. Thus, in the absence of an inland fishery policy to guide and reconcile social, economic and ecological considerations the management of trout fisheries was highly contested. The NEMBA was subsequently amended to allow for area-based management of alien and invasive species (DEA, 2013). Following a political intervention by the Operation Phakisa Ocean Economy process, it was agreed that the AIS regulations were to be amended to accommodate the promotion of trout fishing and aquaculture in waters where trout already exist, while protecting un-invaded waters from the introduction of trout (DEA, 2014).

Inland fisheries for fish production and livelihoods

Inland fishery policies in the South African Union (1910–1961), and subsequently the apartheid-era Republic (1961–1994), included the promotion of the sustainable use of indigenous species as well as established alien species such as carp for food production (Anon., 1944, McCafferty et al., 2012). The dam-building era of the 1960s and 70s stimulated research into the fishery potential of the new impoundments, but most commercial fishery projects failed due to their low productivity and the lack of a market for freshwater fish (McCafferty et al., 2012). Under the apartheid government's 'homeland development policy', implemented by the then Department of Development Aid (DDA), subsistence fishery projects for food security were actively promoted in rivers and impoundments in the former 'homelands' in the 1970s and 80s with mixed results (Batchelor, 1988; McCafferty, 2012). The DDA support included the appointment of a full-time fishery scientist and local fishery officers, research and extension support, and a fishery diploma course at the Tompi Seleka Agriculture College in Limpopo Province. Constraints included administrative issues associated with permits, the linking of fisheries development to the homeland 'nature conservation' departments (instead of 'animal production'), and the lack of public sector human capacity to promote fisheries development (Batchelor, 1988).

The former Orange Free State province's Nature Conservation Department initiated a policy of issuing concessions for commercial harvesting on its major dams (Gariep, Kalkfontein, Bloemhof, Rustfontein and Krugerdrift) from

http://dx.doi.org/10.4314/wsa.v41i5.05
Available on website http://www.wrc.org.za
ISSN 1816-7950 (On-line) = Water SA Vol. 41 No. 5 October 2015

1979 onwards (Anon., 1982; Barkhuizen, 2012). However, despite the existence of a policy to accommodate commercial fishing (Angliss and De Villiers, 1999), the operations proved to be economically unsustainable due to the low market value of freshwater fish, and by 2012 only one marginal commercial enterprise was still operating on Bloemhof Dam (Barkhuizen, 2012). On Lake Gariep, repeated attempts by government to establish a commercial fishery failed, but a vibrant subsistence and recreational fishery developed organically, generating substantial local socio-economic benefit (Ellender et al., 2009).

Customary small-scale fisheries and associated rights on inland waters were not recognised in colonial and apartheid-era fisheries policy, and no restitution process to correct this has occurred in the democratic constitutional era. This has resulted in a growing marginalisation of customary fishing practices and the extinguishment of traditional access rights, due to factors such as forced removals of people from traditional lands, dam building, irrigation schemes, declaration of nature conservation areas and the imposition of fishing rules which criminalise customary fishing methods (Hara, 2015; Tapela, 2015). The erosion of the customary fishing rights and practices of the Thembe-Thonga on the Phongola Dam and floodplain system and Mukuleke peoples in the Pafuri area of the Kruger National Park is documented by Tapela (2015).

Inland small-scale fisheries today

Small-scale fishing for livelihood purposes is widespread and growing in rural areas, with 77% of inland water bodies surveyed by Tapela et al. (2015) supporting some form of small-scale fishing. Most small-scale fishers were poor, but their livelihood strategies were diverse, ranging from a primary livelihood of last resort, to being part of a commercial accumulation strategy. In certain localities, a significant daily income was generated covering family living costs. Value chains were short with no evidence observed of post-harvest value addition.

Small-scale fisheries on inland waters generally lack defined management arrangements, with formal, traditional, or informal resource governance systems existing side by side on many water bodies with varying degrees of cooperation (Tapela et al., 2015). While small-scale subsistence fishers from local communities are generally regarded as having a legitimate claim to fish, in the absence of a supporting governance and rights framework their activities are often marginalised by other resource users with legally-defined rights (Tapela, 2009).

Unresolved or growing user conflicts were present on certain water bodies which arose from a lack of recognition of traditional or customary common-pool resource rights, and the lack of capacity of communities to participate meaningfully in existing formal governance institutions (Tapela et al., 2015). Some form of conflict was reported on 18% of dams surveyed, usually between small-scale and recreational fishers (Tapela et al., 2015). Growing concerns were expressed by the recreational fishing sector about illegal and unsustainable fishing with gill nets (Venter, 2012), as well as by some local communities who feel that their common-pool fishery resources are being monopolized by a few individuals with nets (Tapela et al., 2015).

Small-scale fishing is generally tolerated by the authorities, and in some instances actively supported. In the absence of a defined small-scale fishing rights framework, the provincial environmental authorities, being sensitive to rural food security needs and reluctant to prosecute poor rural people for illegal fishing, have in many instances adopted a 'no-management' approach to growing subsistence fishing use on state dams (Tapela et al., 2015). Some provinces, including the Free State, Eastern Cape, KwaZulu-Natal and North-West, have in recent years promoted small-scale livelihood fishing projects on an ad-hoc basis (McCafferty, 2012). However, in most instances these have lacked the comprehensive institutional support required to create sustainable livelihoods, including clearly defined user rights, empowering co-management institutions, fishery management plans, and access to value-adding opportunities and markets.

In a review of existing inland fishing rights, Hara (2015) recommended the recognition and inclusion of customary and small-scale fishing rights and practices into formal governance arrangements so that optimal and equitable socio-economic benefits can be achieved.

An institutional change opens the way to revise inland fisheries policy

It has long been recognized that the government mandate for inland fisheries should not fall under the provincial environmental departments, as their primary mandate is environmental and biodiversity management, and not economic sector development or sustainable livelihoods and job creation (Batchelor, 1989; Weyl et al., 2007). Following the 2009 general elections, the merging of the sectoral mandates for primary renewable resources (agriculture, forestry and fisheries) into a single ministry, in the form of the Department of Agriculture, Forestry and Fisheries (DAFF), represented a significant institutional change. Marine fisheries and aquaculture, which had previously been managed separately by the Department of Environmental Affairs and Tourism: Branch Marine and Coastal Management, would henceforth be governed together with inland fisheries and freshwater aquaculture by a single organisation, the DAFF's 'Fisheries Branch' (DAFF, 2012a). The DAFF announced that it intended creating a policy and programme on inland fisheries to promote economic opportunities around existing fish stocks within freshwater bodies and rivers (DAFF, 2012b). As storage dams were under the control of the Department of Water Affairs and environmental management under the control of the Department of Environmental Affairs, it was recognized that close departmental collaboration would be required. The DAFF Fisheries Branch and the provincial departments of agriculture however possessed no dedicated human and organisational capacity for inland fisheries and, in the absence of a policy, lacked guidance on how to implement their new mandate.

The Water Research Commission thus commissioned a scoping study on the development and sustainable use of inland fisheries as a participative project in which key government departments and inland fishery stakeholders would contribute to identifying policy requirements for inland fisheries development and governance (Britz et al., 2015). The study focused on defining appropriate institutional arrangements and capacity building requirements. A multi-disciplinary team of researchers from Rhodes University's Department of Ichthyology and Fisheries Science and the University of the Western Cape's Institute for Poverty, Land and Agrarian Studies (PLAAS) conducted a series of consultations and workshops with rural fishing communities, mandated government department representatives, and recreational angling bodies. The team conducted research into the production potential of South African impoundments, reviewed South African inland fisheries literature (McCafferty et al., 2012), evaluated the role of indigenous and local knowledge in inland fishery utilisation (Tapela, 2015), analysed user access rights arrangements and legislation (Hara

http://dx.doi.org/10.4314/wsa.v41i5.05
Available on website http://www.wrc.org.za
ISSN 1816-7950 (On-line) = Water SA Vol. 41 No. 5 October 2015

and Backeberg, 2014), characterised current fishery user groups and their needs, and developed guidelines for the potential stocking of impoundments with hatchery-reared fish from state and private facilities. Institutional requirements for inland fisheries governance were then defined based on a review of South African development and environmental policy, and internationally accepted fishery 'good governance' norms. Based on an analysis of the consultations and research findings, the key elements that will need to be considered in formulating a South African inland fisheries policy are summarised below.

Recommendations for an inland fisheries policy

Potential economic and socio-economic contribution

In contrast to South Africa's predominantly industrial marine fishery, yielding around 630 000 t/year and valued at R7 billion (DAFF, 2012a), the inland fishery sub-sector is characterised by comparatively low productivity. For example, the sustainable fish production of the country's 3 000 major impoundments is estimated at 15 000 t/year (McCafferty et al., 2012), which essentially limits the sub-sector's development potential to small-scale fisheries for sustainable livelihoods, and recreational fishing with the associated socio-economic benefit of the equipment supply and tourism value chains. A central socio-economic objective for inland fisheries development is thus their potential to provide a safety net for the poorest and most vulnerable rural households, and to act as a labour buffer for the largely unemployed male population (Tapela et al., 2015).

Good governance norms for small-scale fisheries

The modern 'good governance' approach to fishery management that has emerged in recent years flows from the principles of 'sustainable development' and the 'ecosystem approach to fisheries' (EAF), which require the integration of the biological and human components of the ecosystem to achieve the objective of sustainable fishery use for optimal socio-economic benefit (De Young, Charles and Hjort, 2008). Key principles of fishery good governance include stakeholder participation, a precautionary approach, and the EAF (FAO, 2010). The recently published FAO Guidelines for Securing Sustainable Small-scale Fisheries (FAO, 2013) recognise the marginalised and vulnerable nature of most rural fishing communities, and promote 'a human rights based approach to achieve poverty eradication, equitable development and sustainable resource utilisation'. The FAO Guidelines (p. 1) seek to achieve this by 'empowering small-scale fishing communities, including both men and women, to participate in decision-making, enjoy their human rights, and assume responsibilities for sustainable use of fishery resources'. Given the historical marginalisation and disadvantage suffered by poor South African communities, the FAO's small-scale fisheries guidelines provide an appropriate normative guide to developing an inland fishery governance policy. A key policy issue will be recognizing existing customary fishing rights and including rights holders into the proposed fishery governance institutions.

Co-management approach required

The governance and management requirements of South Africa's inland fishery sub-sector, which is mainly used by individual recreational and small-scale subsistence fishers, are very different to the well-established marine fisheries sub-sector which is dominated by industrial fishing firms. Inland fishery characteristics vary widely between water bodies in terms of user group profiles, catching methods, targeted catch, environmental impacts, value, and governance institutions, ranging from open access, unmanaged fisheries with diverse user groups, to privately stocked trout waters linked to exclusive property developments (McCafferty et al., 2012). Most fishers are not affiliated to any stakeholder organisation and do not make a full-time living from fishing. Due to the diverse and small-scale characteristics of inland fisheries, centralised management from national level by the DAFF Fisheries Branch (as is applied to the marine fishery sub-sectors) would not be an appropriate governance arrangement to achieve the socio-economic potential of the resource. Rather, local co-management institutions with devolved powers appropriate to the needs of small-scale and recreational fisheries need to be established.

Fisher participation is given substance through the establishment of participative institutions such as local 'co-management committees' which provide structures to negotiate management protocols and actions based on ecosystem considerations and user needs (Hauck and Sowman, 2005). In this context, good governance principles include openness and transparency, responsibility-accountability, effectiveness (and efficiency), participation, coherence, adaptability and responsiveness (Breuil, 2012). Co-management has been accepted by DAFF as the foundation of its marine small-scale fishing policy and it would thus logically form the basis of an inland fisheries policy (DAFF, 2012c).

The co-management approach, facilitated by the management authority, provides a suitable institutional mechanism to address conflicts between competing resource users.

A developmental approach

Implementation of co-management presents a challenge as the organisation of South Africa's fisheries management is based on a centralised, resource-focused approach, and assumes that rights holders (mainly firms) are empowered to use their fishing rights in an economically efficient way. Due to the burden of disadvantage borne by poor fishing communities, small-scale fisheries co-management must of necessity adopt a developmental approach with appropriate public sector interventions to empower fishers to realise the economic opportunities that access to fishery resources provide. The proposed developmental approach to inland fisheries is in line with DAFF policies to promote sustainable rural livelihoods and job creation, food security and the small-scale farming and fishing sector (DAFF, 2012c; 2012d; 2012e). The implementation of good governance through co-management norms however requires a substantial shift in public sector fisheries management institutional culture and organisation, and the acquisition of new skill sets for fishery management officials.

Value chain development

In contrast to marine fisheries, the economic and welfare benefits of inland fisheries are not directly linked to the price of the landed fish, but accrue through the community welfare gains flowing from access to fish for food security by small-scale fishers, and the tourism-linked services and supplies associated with recreational fishing. Public sector interventions to optimise the socio-economic benefits of inland fisheries thus need

http://dx.doi.org/10.4314/wsa.v41i5.05
Available on website http://www.wrc.org.za
ISSN 1816-7950 (On-line) = Water SA Vol. 41 No. 5 October 2015

to move beyond simply growing fish production through the expansion of primary fishing operations, to adopting a value chain approach to inland fishery development. This would include strategies for post-harvest value adding, and promoting employment and entrepreneurship opportunities in the tourism-linked recreational fishery sub-sector. The value of harvested fish should also be considered in terms of the welfare savings for the state generated by access to a secure, nutritious and sustainable supply of fish. Interventions that enhance the value of fish to local communities should thus be promoted; for example, equity of access to fishery resources for rural communities and capacity building to participate in all levels of the associated value chains.

Precautionary approach

A constraint to promoting inland fisheries on most South African water bodies is the lack of knowledge about the productivity and sustainability of the resource, the potential impact on indigenous species biodiversity, and the social and economic characteristics of the resource users (McCafferty et al., 2012). To promote sustainable fishing, a precautionary approach to developing new fishing projects should be adopted in cases where information is limited (FAO, 2010) or where unsustainable fishing effort and/or illegal fishing techniques are likely to be used. Resource surveys as well as social and economic information will be required in order to address information gaps and develop fishery management plans for sustainable fishing which meets the desired social and economic objectives. In keeping with the co-management approach, research should be participatory and include relevant user groups and stakeholders.

Government institutional and organisational arrangements

Based on consultations and workshops conducted by the Water Research Commission project team, recommendations were developed on the roles of the national and provincial departments that have mandates affecting inland fishery governance (Hara, 2015). Government stakeholders accepted that the DAFF is the mandated lead agent for inland fisheries development, and will develop cooperative governance arrangements with the other departments and public sector agencies in respect of inland fisheries. The primary national departments with whom cooperative governance arrangements will be required are the Department of Environmental Affairs which bears responsibility for the National Environmental Management Act, the Department of Water and Sanitation which controls access to public dams, and the Department of Transport which is responsible for water user safety on inland waters.

In line with existing practice, it is envisaged that the national departments will primarily be responsible for policy, legislation, strategy and promoting cooperative governance. The actual management and promotion of inland fishing projects is logically a provincial competency to be carried out by the provincial agriculture departments, in concert with their provincial environmental affairs and economic development counterparts. A staff structure and associated budget for inland fisheries management at the provincial agriculture departments is urgently needed – this must address both developmental goals as well as ensuring management and compliance needs of ongoing fishery projects. There is a need to focus on both recreational and subsistence fisheries in each province – the needs and management of each are often different and require different skill sets for government fishery officers. The existing fishery responsibilities and infrastructure (e.g. fishing licensing, state hatcheries) under the control of the provincial environmental departments should be reviewed, and where appropriate transferred to the provincial agriculture departments. Cooperative governance organisational structures, equivalent to the Union of South Africa's old 'Joint Provincial Fisheries Advisory Board' will be required to coordinate a harmonized approach to inland fishery governance and management.

Legislation

As provincial legislation governing inland fisheries is very rudimentary, lacking definition of sectoral objectives and user rights, new national legislation will be required to give substance to the policy imperatives highlighted above. In the consultative process with government departments, DAFF Fisheries Branch representatives highlighted the need for dedicated legislation to empower the Department to implement its inland fishery mandate. Legislation will be required to confer appropriate legal status on those involved in fishing and supporting activities to enable them to (adapted from Wellcome, 1997):

- Define the appropriate political and administrative levels at which decisions regarding the fishery are made and at which regulations are enforced
- Allocate exclusive fishing rights to individuals and defined groups
- Benefit users individually and collectively from any measures they take to improve the fishery
- Empower them to negotiate collectively with other users of the basin
- Enable them to participate in co-management
- Enable them to seek redress for damage to their resource provoked by other users of the water

There are several legislative options: the Marine Living Resources Act (Act 18 of 1998) could be revised to include inland fisheries as a 'Fisheries Act'; or a dedicated 'Inland Fisheries Act' could be promulgated; or the existing NEMA-aligned provincial environmental legislation could be reviewed and harmonised to include more comprehensive fishery provisions.

The National Water Act (Act 36 of 1998) provides for rights to various forms of water use on public dams, and thus a policy and guidelines need to be promulgated by the Department of Water and Sanitation to guide the management of access to water for inland fishery purposes. The recently published Resource Management Plans (RMPs) for public dams, while designed primarily to manage recreational activities, have made provision for subsistence and artisanal fisheries on certain dams.

Training needs

Most career fishery managers were trained primarily in the biological science and environmental conservation disciplines, and lack training in fishery co-management. These officials are generally appointed to conserve nature; hence the need to establish appropriate capacity at provincial departments of agriculture to promote and manage inland fisheries. Thus, a key need is the training of fishery officials in modern fishery

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Available on website http://www.wrc.org.za
ISSN 1816-7950 (On-line) = Water SA Vol. 41 No. 5 October 2015

governance principles, particularly the skills required to facilitate stakeholder participation and building of co-management institutions. National department staff will require training in inland fishery policy and governance, while provincial-level staff in the departments of agriculture, environmental affairs, and water affairs will require operational training in fisheries management, stakeholder-based co-management processes, and promoting a value chain approach to fishery development.

As small-scale fishers originate from disadvantaged and vulnerable communities and usually lack education, assets, and access to networks, empowering knowledge and representative institutions, their capability to participate in fishery resource opportunities needs to be developed as a primary intervention. Training for small-scale fishers needs to extend beyond the technical aspects of primary catching operations, and include aspects such as knowledge of rights, participation in co-management institutions, and post-harvest value-adding skills. The development of supporting institutions for South Africa's small-scale marine fishery sub-sector has produced some useful co-management training guidelines which are applicable to inland fishery development (Hauck and Sowman, 2005).

Recreational fishing representatives are generally better educated and fully employed, but will also require training in fishery governance processes in order to participate meaningfully in fishery co-management institutions.

Funding needs

To enable effective inland fisheries management in future, sufficient capacity is needed for both the promotion and regulation of the industry. In countries like England, national fishing licences bring in massive revenue because of the amount of anglers participating and the amount they pay annually for a licence. In the USA, the purchase of fishing and hunting related equipment carries a national tax, the revenue of which enables the USA Fish and Wildlife Service to operate effectively. Recreational anglers in RSA have long advocated a national fishing licence rather than provincial licences, provided that the monies received are ring-fenced for inland fisheries management. Both of these options could be explored to generate revenue to sustain more capacity in inland fisheries management.

The developmental side, involving the creation and sustenance of subsistence fisheries in the various provinces requires a different funding approach, which by its nature (poverty alleviation, protein provision) requires substantial government support.

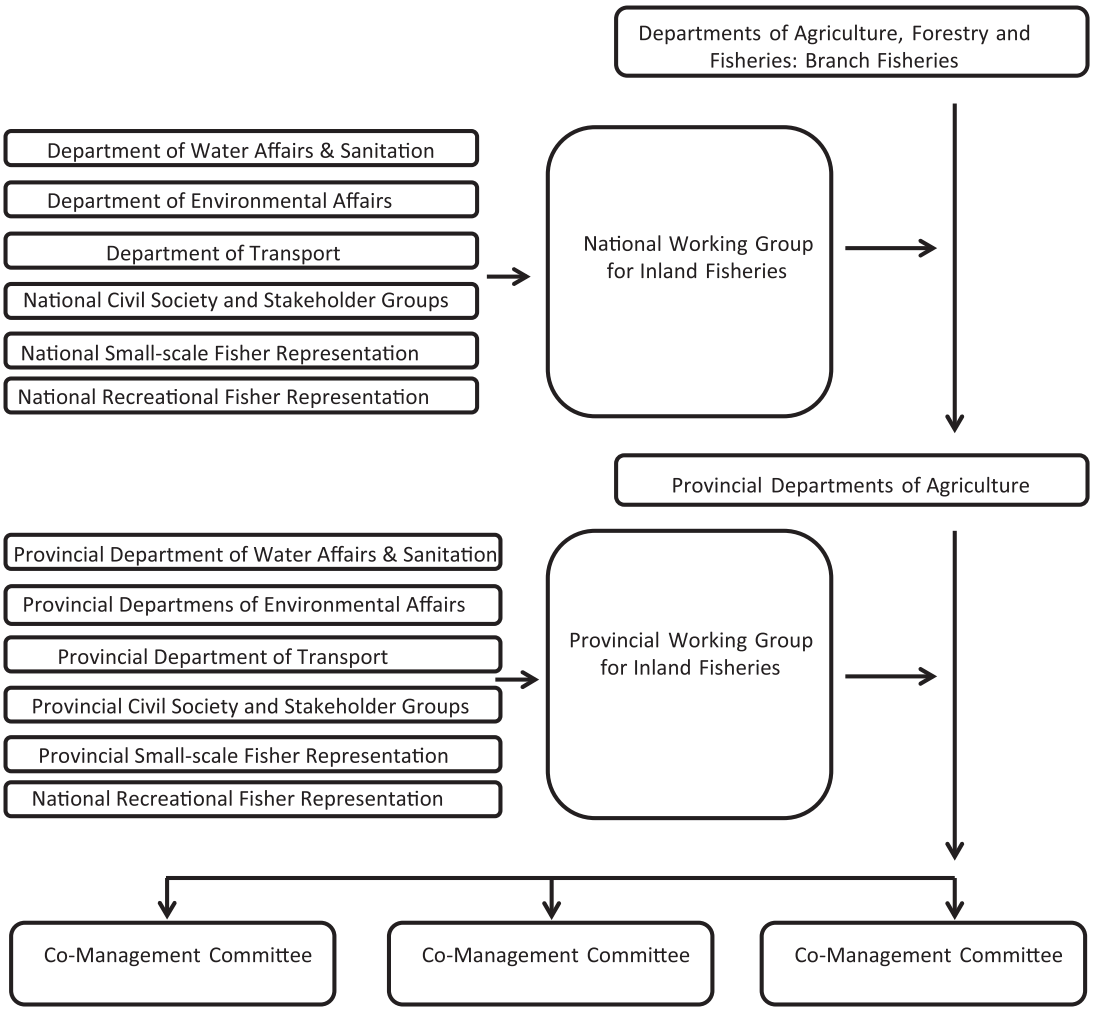

Figure 1
Government organisational structure for inland fisheries proposed by Hara and Britz (2015)

http://dx.doi.org/10.4314/wsa.v41i5.05
Available on website http://www.wrc.org.za
ISSN 1816-7950 (On-line) = Water SA Vol. 41 No. 5 October 2015

Government organisational structure

A recommended organisational structure for governing inland fisheries was proposed by Hara and Britz (2015) (Fig. 1). In this model, the DAFF is the lead national department responsible for inland fisheries policy and for facilitating cooperative governance arrangements through a national working group of key national departments. As inland fisheries are a shared national and provincial competency, with operational matters delegated to the provinces, each province would convene a provincial inland fisheries working group to bring together relevant mandated provincial departments. The provincial departments of agriculture would bear responsibility for implementing the social and economic development aspects of fisheries policy through local co-management committees.

CONCLUSIONS

While South Africa historically possessed a comprehensive inland fishery policy with economic, social and environmental goals and an adequate capacity to manage key aspects of inland fishery development, the current policy vacuum is resulting in missed livelihood development opportunities, growing unmanaged and unsustainable fishing practices, and the perpetuation of apartheid-era inequalities in terms of resource access rights. Available research demonstrates that while inland fish stocks cannot support industrial-scale fisheries, small-scale and recreational fisheries do have the potential to support the creation of rural livelihoods and decent jobs, provided that a policy with clear social and economic objectives is developed. The inclusion of inland fisheries into the DAFF Fisheries Branch mandate has created appropriate institutional arrangements to develop an inland policy which is aligned with national developmental goals such as the National Development Plan and the DAFF Integrated Growth and Development Plan (DAFF 2012d). The major institutional and organisational challenges going forward are: (i) the promulgation of empowering policy and legislation, (ii) cooperative governance arrangements, (iii) capacity building of public sector staff and fishery stakeholder groups, and (iv) the establishment of inland fishery co-management institutions.

ACKNOWLEDGEMENTS

This paper was produced as part of a Water Research Commission (WRC) solicited and funded 'baseline and scoping study on the development and sustainable use of storage dams for inland fisheries and their contribution to rural livelihoods' (WRC Project No. K5/1957/4). The public, private and community participants and project reference group members who contributed inputs during the project workshops, consultations and reference group meetings are thanked for their participation. The constructive comments and suggestions of two anonymous referees are acknowledged.

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