

FOOD SECURITY

Role of dams in providing food security – lessons from Vanderkloof

South Africa's second-largest dam, Vanderkloof, may have been constructed with irrigation in mind, but today also serves as an important source of food for local communities. So writes Peter Ramollo from the Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform.

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The Vanderkloof Dam is the second largest and longest water body found in the Northern Cape. The dam was built as part of the Orange River water supply scheme and was completed in 1977, mainly for irrigation purposes. Today, the dam is primarily used for agricultural and urban water supply. Hydroelectricity is also generated at the dam, feeding electricity into the Eskom grid during emergency situations and peak periods.

The Vanderkloof Dam also provides recreational opportunities. Examples include the Vanderkloof Boating Club, a group of kayakers and sports enthusiasts, and an angling club. The most well-liked activities taking place in the dam are fishing activities. Anglers cast their lines from the dam's banks in search of various types of fish. The busiest fishing months to fish for the prized largemouth yellowfish seem to be April and December holidays.

On occasion, a small number of weekend anglers crowd to the area, setting up their angling gears for catch-and-release. Their fishing activities are mostly undertaken for fun and do not impact negatively on fish populations.

Privileged anglers often clash with local communities who fish for their livelihood at the dam. Conflicts mainly revolve around fishing grounds and access to the dam. Local fishermen were denied access to fish in the dam during the apartheid regime. Even during the post-democratic dispensation, the accessibility to the dam is still a challenge because recreational anglers claim to be in full charge of dam management.

Government has recognised these challenges, and zoned the dam for recreational and subsistence fishing activities so

that local people can also access and benefit from this natural resource. Recreational anglers have expressed concern that if more intensive fish harvesting by non-recreational members are allowed that it could adversely affect fish populations and consequently eco-tourism which brings millions of money in the area. It would therefore be important to establish fish stock estimates, followed by regular monitoring to ensure (and proof) small-scale fisheries' sustainability.

Although this article is not focusing on inland fisheries policy, it is important to note that the country did not have an inland fisheries policies or guidelines to guide state dam management and resource allocation until February 2022. Policy development occurred concurrently with an experimental study by Rhodes University, who provided additional information towards policy development.

Guidance has accordingly been provided for decision-making towards the sustainable development of South Africa's inland fisheries sector. One of the challenges still remaining is the limited information on economic contributions of small-scale fisheries for rural communities across the country. Contrary to the longer history of recreational fishing, small-scale fishing is largely an informal activity with no established systems for advocacy. Therefore, data is absent. Poor management has further hindered the development of inland fisheries as a contributor to rural economy and livelihoods.

Fish studies in the eighties

In the early eighties, Allanson & Jackson; Tumi Tommasson conducted a study in the dam. Their studies revealed that the fish stock in the dam presented an opportunity for a cheaper protein option to communities in the area. The researchers reported that harvesting of stocked fish in the dam could potentially increase the economic benefits for small-scale and subsistence fishermen. Consequently, this could create financial benefits and provide communities with livelihoods and cheaper sources of protein. Though their study revealed that the dam has potential for small-scale commercial fisheries they did not provide management guidance towards balancing recreational and eco-tourism and community beneficiation. Unfortunately, no small-scale fish harvesting commenced, leaving communities without the opportunity to improve social and economic benefits.

Rhodes University surveys in 2012

According to the University of Rhodes, approximately 250 tonnes of fish can be harvested every year using gill nets and longlines; which would meet the market demand at the time of the study. Their socio-economic research report has showed that there is a suitable market, and people around the area are willing to pay for fish, suggesting that you could expand the market in the area, and possibly into other provinces. Their conclusion was that the dam offers great opportunities to develop rural and establish community-based fisheries, hence these findings were used to make use of the opportunities the dam offers.

Challenges in Implementation

South Africa's Constitution recognises the sustainable use of natural resources to protect livelihoods, but national and provincial policies do not provide for small-scale fisheries

and its management. Policies are found to still be old and outdated within the context of the New Administration, i.e. post-1994. These outdated regulatory frameworks are geared towards advancing fish conservation and recreational fishing while excluding any form of small-scale inland fisheries. In fact, small-scale inland fishing is regarded an illegal activity. The new national legal framework finalised in 2022 now addresses current situations and challenges of food security and unemployment, the provincial legislation largely remained the unchanged. Amending these old provincial Ordinances, Acts (existing rules) and regulations takes time while fishermen continued to suffer in the meantime. With this slow legislative alignments' (amendments) progress, it was decided to develop the Vanderkloof Experimental Fisheries Management Plan (VEFMP) to guide the process in the meanwhile, in recognition of human rights towards sustainable use of natural resources while also protecting livelihoods.

During the development of the VEFMP, public engagements were held where heated discussions and disputes about the legality of inland fishing in the area were deliberated. Opponents to the small-scale fishing project indicated that the dam contains the threatened largemouth yellowfish and that gillnets (a non-specific fishing method) might cause the extinction of this threatened fish species. In addition, they also contended that commercial inland fisheries are illegal under both national and provincial regulations. In contrast, local communities contended that they require complete access to the dam in order to fish for food security and livelihoods, as opposed to recreational fishing that is purely for enjoyment (no livelihood dependency). Irrespective of these arguments, stakeholders were still able to draft, and obtain approval, for the VEFMP through the establishment of an Advisory Group who aids in resolving any disagreements that may emerge throughout the implementation of the VEFMP project.

The Advisory Group consist of all of the relevant parties and stakeholders, namely the Northern Cape Department of Agriculture, Land Reform, and Rural Development; the Northern Cape Department of Environment and Nature Conservation; the Department of Water and Sanitation; the Free State Department of Economic, Small Business Development, Tourism, and Environmental Affairs; the Department of Environment, Forestry, and Fisheries, Rural Fisheries Programme; Rhodes University; and Masifundise Development Trust, South African Sport Anglers and Casting Confederation; South African Consolidated Recreational Angling Association; Renosterberg Municipality; Kraal fishers; Vanderkloof Rates Payers Association; Vanderkloof Angling Club-Recreational Anglers and South African United Fishing Front. Their role is to provide oversight, advice, and to set and amend rules on the kraal and experimental fishery project.

After careful consideration, the management authorities agreed to issue the necessary fishing permits containing a special condition instructing the release of protected fish species back into the dam. The reasoning for issuing research permits was to allow for a phased approach towards a commercial project. To date, the VEFMP appears to have clear and implementable objectives, as preliminary information suggests it is advancing the interests of local fishermen and food security, while regulatory amendments are underway.

Management of fisheries

The FAO (Food and Agriculture Organization) of the United Nations is an international organisation that leads international efforts to defeat hunger and improve nutrition and food security. In 2015, FAO released a report '*Voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication*'. The report states that fish resources should be accessed by all fishermen and managed sustainably to minimise stock depletion and overharvesting, and there should be a balance between conservation and economic development agendas. It further reiterates the principle of co-management in bringing all roleplayers together to deal with the conflicts and matters of concern.

The management committee should then share information, be inclusive, consultative, transparent and democratic to enhance the principle of responsible governance. These principles were encapsulated in the VEFMP, outlining a theoretical approach for fisheries management. Subsequently an experimental small-scale project at Vanderkloof was established, summarising the pertinent issues to be considered during the management and development of this fisheries project. The VEFMP allows for long-term change, and urgent short-term adaptive management, with the advisory committee fundamentally functioning as a co-management structure, as outlined by the FAO in terms of reaching consensus decisions and oversight. With the advisory committee consisting of all relevant stakeholders, they are able to make recommendations, oversee implementation and make adaptive management changes whenever new information emerged in order to ensure sustainable fisheries and project development.

During the development and implementation of the VEFMP, principles of effective governance, inclusivity, transparency and consultation processes were duly applied and taken into consideration. Though the objectives of the FAO Small Scale Fishery guidelines are not legally binding, it provided assistance in establishing criteria, principles and information to achieve sustainability in developing small-scale fisheries for livelihoods. To date, the management of small scale-fishing at Vanderkloof Dam appears to contribute to income generation in the Renosterberg area.

In terms of the ecosystem approach principle, the FAO suggests that governments should recognise the potential for inland small-scale fisheries and the need for legislative frameworks to manage and develop this fishery sector. Thus, legislative frameworks should follow the principles of an ecosystem approach that is inclusive and consultative, and parties need to strike a balance between conservation, economic development and social justice. Indeed, the VEFMP is aligned with the ecosystem approach principle as the Vanderkloof fisheries project seem to contribute towards job creation, poverty alleviation, maximising economic potential and social benefits; and empowering disadvantaged local communities to participate and realise opportunities associated with inland fish resources. This is backed by the fact that people fished for a living, and where high conservation value (protected) fish were caught, the fishermen released the fish uninjured back into the water.

During the implementation of the VEFMP, subsistence fishing for livelihood was implemented in a wide range of areas within the permitted zones at Vanderkloof Dam. The zoned areas stretched from the dam wall to upstream where the river flows into the dam. All the sites were accessed through boat. Therefore, fishermen were allowed to fish for livelihoods except on weekends. The harvested fish were measured, and data was collected to determine the biological and economic sustainability of small-scale fisheries. The records keepers were DENC and Rhodes University. The reasons for data collection and record keeping were for proper management of the fisheries activities in order to avoid over-exploitation of fish and to leverage the inland fisheries policy direction.

Community beneficiation

The FAO suggest, as captured in the VEFMP, that small-scale fishing communities should benefit from fisheries development, meaning that communities should promote social responsibility by encouraging cooperation with other stakeholders in adjacent business areas so that they can benefit fairly from resources. The VEFMP encourages and promotes fishing activities to provide employment opportunities for local rural communities. It is suggested that community-based fisheries can generate income, fight poverty and continue to provide local fishing communities with an affordable source of protein for sustainable socio-economic growth. This was done primarily to support and improve the socio-economic status of fishermen in the Vanderkloof region.

Fish caught was sold in the area, enabling members of the community to generate extra money that enabled them to purchase basic necessities such as bread, vegetables, flour, and some vegetables they could not produce themselves. Most of the household income of fishermen in the Renosterberg area comes from fishing and working on farms, potentially making the fisheries income stream an important area for further development. During the COVID-19 crisis fishermen were unable to catch fish because the government did not define fishing as an important service (most probably due to the outdated legislative frameworks and policies), leaving fishing villages across the country without the means to provide for their families. This has undoubtedly had an impact on fishermen's lives, irrespective to the fact that inland fisheries are acknowledged to offer significant potential in enhancing food security, economic growth and poverty reduction.

Capacity building

FAO advises that countries should have capacity building programs to improve beneficiation of small-scale fishing communities, focussing on the marginalized and vulnerable communities to ensure equitable beneficiation across the small-scale fisheries value chain. Through training of communities they would be equipped with a range of skills and knowledge of fishing methods, on how to adapt to adverse changes in the system (building resilience), and manage fish stocks sustainably. This is in line with the VEFMP, which says there is a need to strengthen and develop capacity for community economic activity, participation and building resilience to the fisheries sector.

The cost of carrying out the experimental research was projected

to be more than R5 million, with the department also offering further help by committing to managing and transforming the sector. The budget was used to provide fishing equipments and a boat to facilitate an access to the fishing areas. Procured items have enabled fishermen to increase their catch rates, improve their incomes and provided improve food security. Part of the budget was spent on the training of crew fishermen in 2018, purchase of freezers, a vehicle, and salaries for the experimental fisheries crew. Training in all aspects related to fishing activities seemed very important during the Vanderkloof dam's experimental fisheries phase. Though the focus was not on training up to now, the limited training offered to crew members and kraal fishers it does enable sustainable fishing and use by fishermen in future efforts in the fisheries sector or in seeking employment elsewhere.

Value chain and food security

Inland fisheries value chains are important for the long-term viability of small-scale fishermen's livelihoods and if benefits like social justice, socio-economic, rural development, food security, job creation and poverty alleviation are to emanate. Once again, the FAO SSF guidelines capture the importance of including the entire value chain into the development of the inland fisheries industry; from fishing to all other activities related to fishing, such as processing, marketing of fish products, and distribution of fish. In order to maximize social and economic benefits, the inland fisheries sector, its governance, and sector support should be centred on a value chain approach.

The Vanderkloof Dam's experimental fishers collected fish, dissected, weighed, and sold them to assess the market viability in the area. A deal was also struck with local fishermen fishing below the dam wall using traditional kraal fishing methods, to buy fish from the experimental fishers, but it did not work out as expected. The traditional fishing operations below the dam wall are carried out by adult and youth, predominantly African and coloured people, who lack formal schooling, a source of income, and government support.

The majority of these fishermen are married with children, and have some understanding of the economic ramifications of fishing but little knowledge of overfishing and fish migration patterns. Instead, these kraal fishermen refused to weigh their fish in order to determine an accurate price. They wanted to purchase and trade fish based on their size. They also had difficulties in buying fish, while some kraal fisherman even believed they should be given fish for free. Despite the full explanation of how the initiative works, some fishermen had unrealistic expectations of obtaining free fish and inheriting project equipment.

When they learned that things were not progressing as planned, they joined those who were against the project. Some of them previously went on a TV broadcast and said that Rhodes University was using gill nets and harming the dam ecology. It appears that some fishermen misunderstood the objectives of the project, or the initiative did not attract the correct individuals to sell fish for optimise earnings, or the project attracted opportunistic persons who saw a chance to inherit project equipment such as gill nets, a boat and a bakkie.

Communities who purchased fish from the project, as well as those who fished behind the dam wall in stone kraals, found it difficult to sell their catches door to door. Poverty in the Renosterberg municipality has a significant impact on the buying power of residents. Majority of people have little or limited income, making it difficult for them to buy basic necessities and non-essential items. This lack of buying power also limits their access to quality healthcare, economic growth, and education further perpetuating the cycle of poverty and hampering overall development.

Accordingly, fishermen would frequently take any price because the fish decay quickly in the spring and summer due to a lack of cold storage facilities. Customers also commonly purchased fish on credit at low prices, and occasionally failed to make payments on time or at all. Another reason why fishermen give fish on credit is to build and keep an acceptable customer network in order to consistently deliver fish to those local communities.

Other challenges for fishermen in expanding their market into the nearest towns are transport and storage (or preservation) facilities. If the government could improve fishing infrastructure and facilities, fish could be preserved conveniently for extended periods of time and sold at market prices. As a consequence, it could be feasible to distribute products equally to retail dealers in big towns and other places. The lack of facilities for preserving, filleting, smoking, or salting fish results in the catch of kraal fishermen being sold whole, which is another issue. It demonstrated that fishermen require government assistance in order to access the deeply competitive official market, stop post-harvest losses, and conform to health regulations.

In conclusion, in order to move the small-scale fisheries project forward, the community need to organise themselves and form a cooperative. The initiative should attract people who want to fish for commercial purposes, not simply people who want to fish for fast cash to buy few items. Fishing is a physically demanding occupation, therefore individuals must be willing to work long hours to catch fish, process, and sell them in order to recover the money spent on fuel, maintenance, and to pay their salaries. The abrupt handing over of the project to the community most probably would result in it collapsing, just like many other government projects. Inland commercial community fisheries projects would necessitate a medium to long-term investment and support from government for it to be successful.



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