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POLICY BRIEF | 1913

Fisheries in Zambia:

An undervalued contributor to poverty reduction

FISHERIES IN ZAMBIA:

AN UNDERVALUED CONTRIBUTOR TO POVERTY REDUCTION

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Summary

- The fisheries sector contributes around 1 percent on average to GDP (US\$109 million in 2007)³. Annual Government allocations over the same period averaged US\$2.3 m, or 0.12 percent of the national budget. The largest proportions are allocated to salaries and administration, though monitoring, training, extension, aquaculture and research are increasingly recognized.
- Total production from capture fisheries is approximately 65,000 to 80,000 tonnes per annum, with an additional 5,000 mt estimated from the emerging aquaculture sector. Average per capita fish supply has declined from over 11 kg in the 1970s to approximately 6.5 kg in the 2000s.
- Contributions to rural economic growth and commerce provide significant economic opportunities for the poor. Although the fisheries sector provides income for over 300,000 people, such benefits are poorly quantified and often overlooked.
- The sector's contributions to national food security and public health are likewise largely undervalued. Fish and fish products account for more than 20 percent of animal protein intake and provide essential micronutrients to the majority of Zambia's population who are highly vulnerable to malnutrition.
- Fishing communities have recently been recognized as a target population in the national response to HIV/AIDS. A strategic approach to securing the sector's wider human resources needs is required and will depend on effective linkages between fisheries and other relevant government sectors.
- Expenditures through the Department of Fisheries have shown slow improvements in efficiency over recent years, but in several categories remain below 50 percent of allocations due to insufficient capacity, limited budget implementation period and weak administrative processes. In addition, efficiency gains need to be more clearly linked to tangible poverty reduction outcomes.
- Zambia has a rich endowment of water resources and significant potential for the development of hydropower, flood control, urban supply, and agriculture. Investments in these areas can affect flow regimes and habitat availability, which in turn can affect the productivity of fisheries and their contribution to the comprehensive value of water resources.
- The contribution of the fisheries sector to the Government's goal of more inclusive, diversified and sustained economic growth can be addressed by:
 - strengthening the governance system for water resources;
 - implementing a plan of action to more efficiently apply existing resources to productive purposes;
 - enhancing the value of capture fisheries through post-harvest investments;
 - facilitating trade and improving markets; and
 - fostering the growth of sustainable aquaculture.



¹ M.M. Musumali and M. Wishart are from The World Bank (Zambia)

² S. Heck and S.M.C. Husken are from The WorldFish Center (Zambia)

³ An average of 3 percent of GDP at 1994 constant prices, contributing approximately US\$18.2 million per annum over the period 2002-2007 (Central Statistics Office)

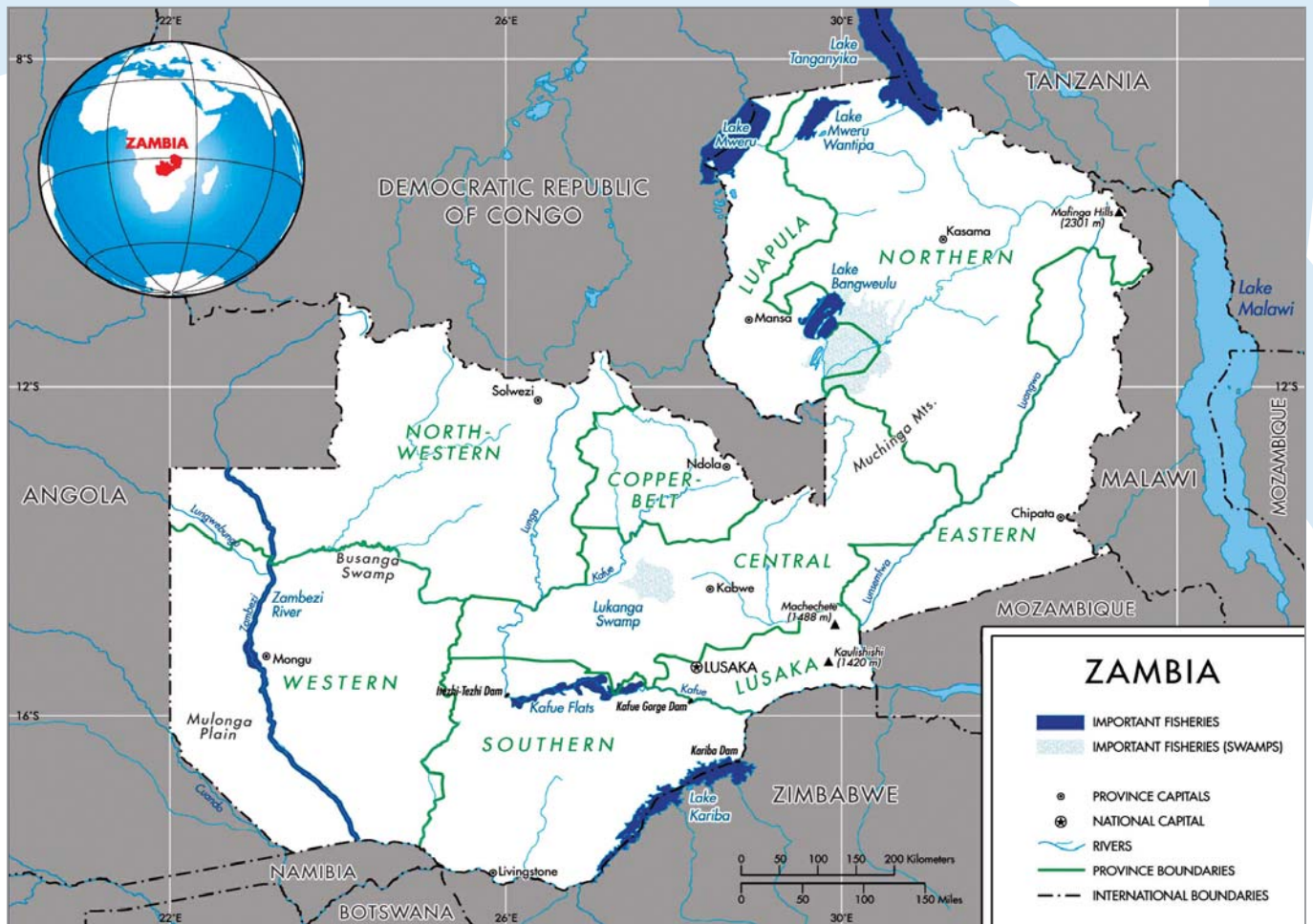
The Potential of the Fisheries Sector in Zambia

Zambia's rich endowment of water resources provides the foundations for supporting significant economic growth and development. Water area, including rivers, lakes, swamps, flood plains and streams accounts for approximately 145,194 km² (19 percent of total territory)⁴. Although water is abundant, access and use is limited by human, institutional, and financial resources. The uneven distribution of water resources across the country and high climatic variability result in frequent floods and droughts, which coupled with increasing degradation of the resource base are increasingly jeopardizing the role of water in the country's economic development. Global Circulation Models of climate change predict that over the next 20 to 30 years Zambia will experience increasing temperatures, with longer dry periods and more intense rainfall and increased storm events.

The country is landlocked and lies in an area drained by the Congo River Basin, comprising the Luapula, Chambeshi and

Tanganyika catchments, and the Zambezi River Basin that drains 72 percent of the country's land area to the south and south-west, including the upper reaches of the main branch of the Zambezi River, as well as all of the catchments for the Kafue and Luangwa rivers. There are 11 major fisheries: four within the Congo Basin (Bangweulu, Mweru-Luapula, Mweru-Wantipa and Tanganyika) and seven in the Zambezi Basin (Kafue, Kariba, Lukanga, Upper Zambezi, Lower Zambezi, Itezhi-Tezhi and Lusiwashi). Fish ponds and water impoundments also contribute to the fishery resource inventory of the country.

Roughly 68 percent of the population live below the national poverty line (Figure 1), with poverty concentrated in rural areas and affecting 81 percent of the rural population. Poverty and food insecurity in Zambia generally stem from over-reliance on rain-fed agriculture, and associated effects of frequent unfavorable climatic conditions, along with inadequate incomes, access to markets and transport facilities to enable the transfer or purchase of food, compounded by low economic diversification into sectors such as fisheries that could supplement crop production.



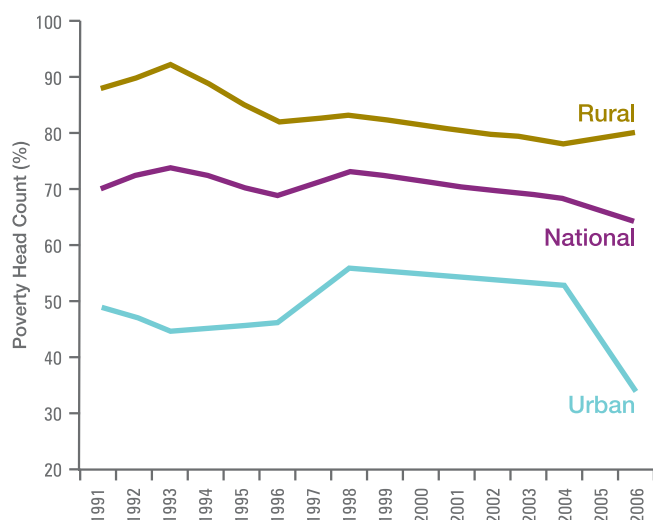
⁴ FAO, 2006

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The fisheries sector has contributed between US\$51 and 135 million per annum to GDP over the period 2002-2007, averaging around 1.24 percent of GDP at current prices⁵. This relatively small contribution at the macro level masks important contributions of fish production to the rural economy through employment, earnings and as a source of food. An estimated 300,000⁴ people earn part of their income directly as fishers and fish farmers or indirectly as traders, processors and other service providers (boat building and repair, net manufacturing, fuel wood supply, power supply, transportation). It is estimated that more than 20 percent of animal protein intake for people in Zambia is from fish⁶. Hence there is an important role for fish and fish products in the food and nutrition security of the Zambian population, especially the urban poor and people living with HIV and AIDS (PLHIV).

Figure 1: Poverty trends 1991-2006



Fisher folk, including female fish traders, are at particular risk of HIV⁷. Fishing areas show among the highest HIV prevalence in the country outside urban centres. Many factors contribute to this vulnerability, including high mobility and migration, poor access to health services, unequal gender relations along the fish marketing chain, and the transient nature of fishing communities with high daily cash incomes and few or no investment opportunities⁸. The long-term sustainability of Zambia's fish supplies requires concerted efforts by fisheries, health and social services to address the human resources needs in the sector.

Beyond the statistics in Figure 1, and less quantified at this stage, the sector plays an important role as a driver of rural commerce in otherwise remote parts of the country where fisheries are the only source of income and purchasing power.

Fisheries allow for income generation almost year-round and participation in the sector is very broad, including women, youth and urban poor who have few alternative income opportunities. Some of Zambia's fisheries also serve a 'safety net' function for urban and rural families either seasonally or in times of economic downturn. The sector has often absorbed labor when the formal sector contracted. In areas around Lake Mweru-Luapula fishery, a significant number of new-comers invested in rural fisheries between late 1980s and 1990s, a period during which the urban economy declined; between 1990 and 2000, Nchelenge and Chiengi districts where fishing is profitable experienced some of the highest population growth rates⁹. Estimated formal employment in 2004 for the primary sector was approximately 25,000 people, while the secondary sector (trade) employed approximately 30,000⁴. Yet through informal and seasonal fishing and trade, over 300,000 people earn incomes from the sector.

Capture Fisheries

Fishing in Zambia is dominated by artisanal fishers using traditional vessels. They are found in all the country's fisheries and waterways and contribute most of the national production. In addition, there are between 50 and 100 industrial operators found mainly on Lakes Kariba and Tanganyika.

Annual fisheries production increased from 40,000 mt per year in the late 1960s to over 75,000 mt per year in 2000⁴ but has since stagnated between 65,000 and 80,000 mt per year (Figure 2)¹⁰.

Per capita output has declined from 11.4 kg in the 1970s to 6.4 kg in 2003⁴. Annual catch statistics do not record the contribution of smaller fisheries and so production is likely underestimated. Between 1999 and 2004, approximately 30,000 artisanal fishers accounted for 85 percent of catch, while industrial producers, mainly associated with the production of pelagic species on Lake Tanganyika (kapenta and *Lates* sp.) and Lake Kariba (kapenta), accounted for the remaining 15 percent⁴ (Box 1).

The Bangweulu and Tanganyika fisheries of the Congo Basin are most productive, accounting for 43 percent of annual production in 2000⁴. Zambia's capture fisheries – like tropical, multi-species fisheries in general – are very resilient and will continue to produce fish at more or less the same level of biomass.

⁵ An average of 3 percent of GDP at 1994 constant prices, contributing approximately US\$18.2 million per annum over the period 2002-2007 (Central Statistics Office)

⁶ FAO, 2007

⁷ Allison and Seeley, 2004

⁸ Bene and Merten, 2008

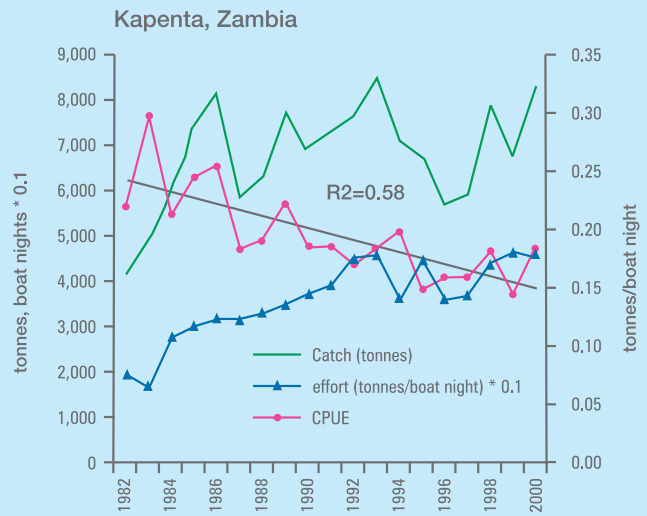
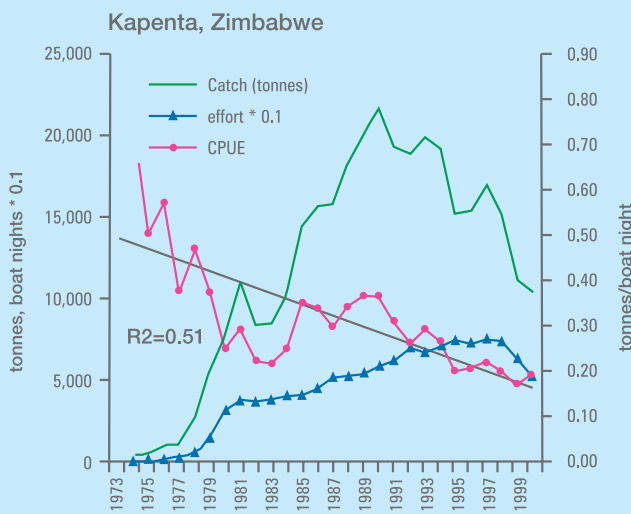
⁹ Gordon, 2005

¹⁰ Survey data from the Department of Fisheries, Ministry of Agriculture and Cooperatives, Zambia

Box 1: Kapenta in Lake Kariba

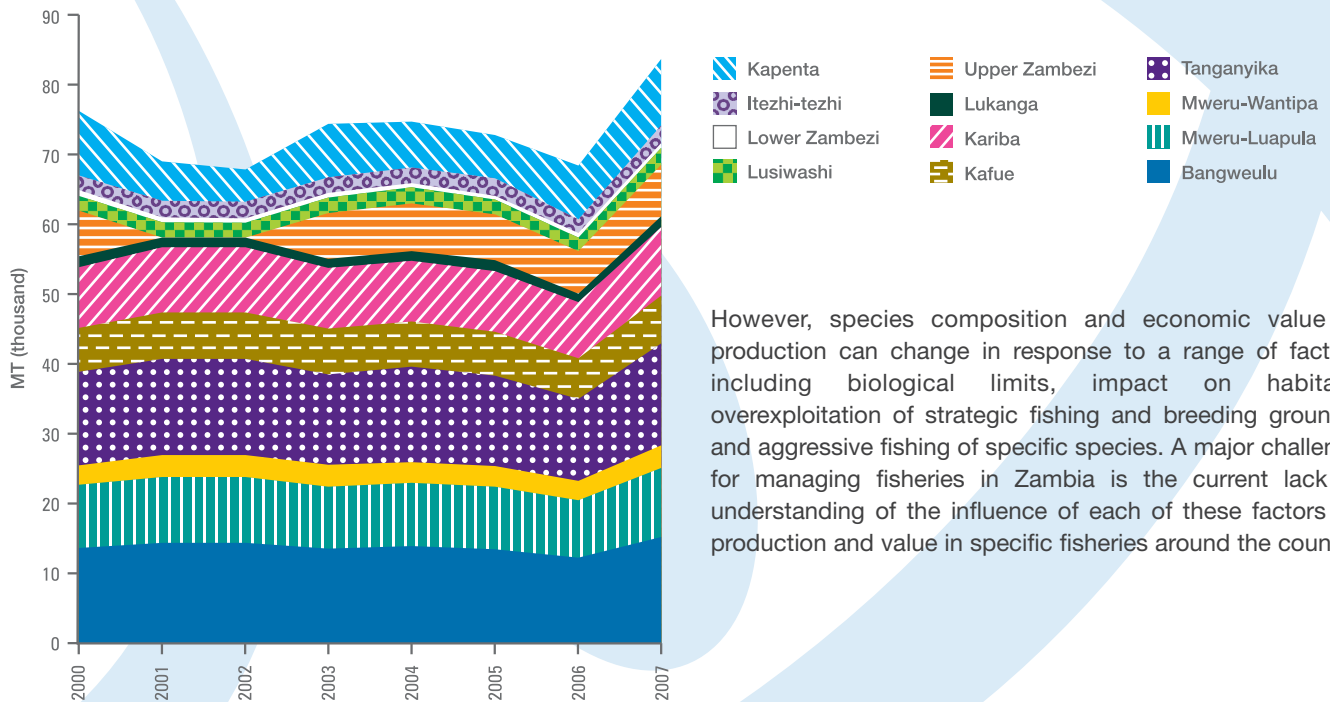
Kapenta, a local name for small pelagic species (*Limnothrissa miodon* and *Stolothrissa tanganicae*), were introduced into Lake Kariba, a man-made reservoir on the Zambezi shared between Zambia and Zimbabwe, in the late 1960s from Lake Tanganyika. These fast maturing species have since developed into a lucrative fishery.

While Zimbabwe encouraged the development of a structured commercial fishery driven by larger off-shore¹¹ operators, Zambia witnessed a strong growth of a small-scale fisheries dominated by in-shore artisanal fishers. These different approaches have historically resulted in very different production levels and marketing systems¹².



Source: CPUE in tonnes/boat night in the offshore kapenta fishery in Zimbabwe (1974-2000) and Zambia (1982-2000)¹³.

Figure 2: Fisheries production estimates in metric tonnes (including kapenta from Kariba, Itezhi-Tezhi, and Tanganyika)



However, species composition and economic value of production can change in response to a range of factors including biological limits, impact on habitats, overexploitation of strategic fishing and breeding grounds, and aggressive fishing of specific species. A major challenge for managing fisheries in Zambia is the current lack of understanding of the influence of each of these factors on production and value in specific fisheries around the country.

¹¹ Industrial or semi-industrial operators whose activities are undertaken away from the shoreline, as opposed to artisanal fishers who mostly operate close to shore

¹² Overa, 2004

¹³ Madamombe, 2002

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Aquaculture

Aquaculture is the world's fastest growing food production sector and given the excellent natural conditions has tremendous potential for growth in Zambia. Fish farming dates back to the 1950s, but as in most of Africa, has remained at relatively low levels. There are currently more than 6,000 small-scale fish farmers and over 13,000 fish ponds countrywide, predominantly in the Eastern, North-Western, Northern and Luapula provinces. Approximately 15 large-scale commercial fish-farms are spread along the line of rail on the Copperbelt, and Lusaka and Southern provinces. Commonly farmed species include the three spotted tilapia (*Oreochromis andersonii*), the long-fin tilapia (*Oreochromis macrochi*) and the red breasted tilapia (*Tilapia rendalli*)¹⁴. In addition, a number of exotic species are farmed, such as the common carp (*Cyprinus carpio*); the Nile tilapia (*Oreochromis niloticus*); and the red swamp crayfish (*Procambarus clarkii*).

On average the sub-sector produces approximately 5,000 mt per year, of which 75 percent is estimated to be from small-scale producers⁴. There is strong investor interest in Zambia to build on the successful experience of aquaculture on the Zimbabwean side of Lake Kariba, which generates over US\$25 million annually. While aquaculture is showing strong global growth and presents a cost effective system for fish production, technical expertise, services and regulatory frameworks are still emerging and require support in Zambia.

Developments in the agriculture, water and energy sectors are a source of significant potential threats to fisheries and aquaculture. Investments in irrigation and water regulation in floodplains such as the Kafue Flats, a primary growth area for commercial agriculture as well as a main fishery, are beginning to have an impact on fish habitats and fisheries production patterns. Similarly, the planned expansion of the country's capacity for hydroelectric power generation will likely affect water flows and hence fisheries and aquaculture in the Zambezi Basin and the Kafue sub-basin, yet it also presents opportunities for development of reservoir fisheries and aquaculture development. But the current lack of an integrated planning process further accentuates the risks and unpredictability for the fisheries and aquaculture sector which at present does not have a strong political voice. Principles and good practice of Integrated Water Resources Management need to be promoted and reflected in water resources legislation and management.

Additional risks for fisheries as well as aquaculture arise from pollution caused in part by the mining sector and chemical use in agriculture in the Kafue and Zambezi River Basins. The unregulated introduction of fish for aquaculture is a further

potential source of bio-security risks affecting the sector. Periodic outbreaks of fish diseases over the past few years have led to increased efforts by Government to build capacity for research and monitoring¹⁵. The Government is currently addressing these policy issues through development of a National Aquaculture Strategy and Implementation Plan.

Markets and Trade

Demand for fish is growing strongly in Zambia, as elsewhere, in response to population growth (1.6 percent p.a.) and increasing urbanization. Overall per-capita supply in the country has declined over the years from over 11 kg/annum in the 1970s to 6.5 kg today. The 'supply gap' for simply maintaining the current low level of supply will amount to a further 10,000 mt by 2015. Bringing per-capita supply back to 10 kg would require an increase in annual production by an additional 50,000 mt by 2015.

There is no systematic and comprehensive system for documenting fish prices, but 2008 consumer price surveys indicate that both 'bream' (*Tilapia* species) and 'kapenta', the most common fish products, are among the leading items driving food price inflation. The price for dried kapenta, a common low-cost fish product, for example has seen significant monthly price increases in 2008, from 4.1 percent between May and June to 13.9 percent in July-August and 8.4 percent in November-December¹⁶.

The main domestic markets for fish include the urban centres in the Copperbelt Province and the capital Lusaka. With over 40 percent of population living in urban areas, Zambia is one of Africa's most urbanized countries, a factor that globally correlates strongly with increased demand for fish. Historically, there has been a strong connection between the demand for fish from the country's mining populations and the expansion of fish trade. This continues today as the large fisheries in Luapula and Northern Provinces are mainly servicing the markets in the Copperbelt. Fisheries in the Central and Southern Provinces, on the other hand, are more focused on the Lusaka market.

A range of fish and fish products are being marketed domestically. The main species include several *Tilapia* species ('breams') and a number of small pelagic species known as 'kapenta' (*Limnothrissa miodon* and *Stolothrissa tanganicae*) and 'chisense' (*Angraulicypris* sp. and *Poecilothrissa moeruensis*). These species have broad market acceptance throughout the country. In addition, catfish and a range of local species have smaller markets.

¹⁴ FAO, 2003

¹⁵ FAO is providing capacity building support at regional level, triggered by an outbreak of Epizootic Ulcerative Syndrome (EUS) in the Zambezi in 2007

¹⁶ Central Statistics Office, January 2009

While breams are typically marketed fresh, and to a lesser extent dried or smoked, kapenta and chisense are usually marketed dried. Processing is almost all at an artisanal level by small enterprises run predominantly by women.

A few enterprises process and market higher-value fish products through supermarkets in the country and regionally. Frozen bream and kapenta, canned 'bukabuka' (*Lucioides stappersii*), a local species from Lake Tanganyika, as well as dried kapenta find their way into these markets.

Overall, however, fish processing and marketing is dominated by artisanal operations that are targeted at the large demand for low-cost products. Major constraints exist for safeguarding and increasing the economic and food security value of this sector. Post-harvest losses of fish between capture and consumption are estimated at around 30 percent on average – similar to other artisanal fisheries in Africa. Access to improved technologies and services, including business support and financial services, is very limited and investment in post-harvest activities is correspondingly low. This appears to be an immediate entry point for support, but any investment in technologies and services needs to be based on a much better understanding than currently available of relevant markets and the economics of artisanal fish processing and trade.

In addition to domestic markets, Zambia's fisheries also serve regional markets. By far the most important market is in neighboring Democratic Republic of Congo (DRC). The large populations in urban centres and mining areas in Katanga Province attract fish trade from all of Zambia's fisheries. In particular, however, this applies to the fisheries in Luapula Province and Northern Province, some of which are from water bodies shared with the DRC. The proximity to these fisheries, higher market prices and relatively good transport infrastructure make the markets in Lubumbashi and the rest of Katanga Province very competitive compared to domestic markets. Much of this cross-border trade, however, is unrecorded and public revenue raised from this sector is likely to be very limited.

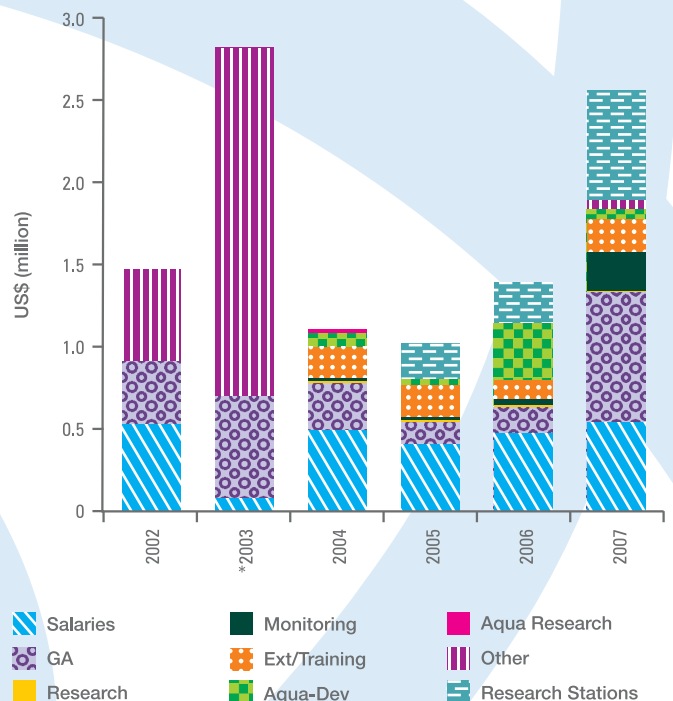
Allocations and Expenditures in the Fisheries Sector

Development of the fisheries sector is the responsibility of the Department of Fisheries (DoF) within the Ministry of Agriculture and Cooperatives (MACO). The allocation of public funds provides some indication of the relative importance afforded to the different sectors. On average the agricultural sector, which comprises the agriculture, forestry

and fisheries sub-sectors, contributes 20 percent to GDP. Of the three sub-sectors, fisheries contributes approximately 1.24 percent of GDP at current prices. The DoF receives on average 0.12 percent of the annual budget compared to 0.30 percent for agriculture and 0.27 percent for forestry¹⁷.

The DoF is mandated to carry out a variety of core functions and responsibilities. Functional areas examined within the Ministry of Finance and National Planning Financial Reports for the years 2002 to 2007 include *aquaculture research, aquaculture development, extension/training, monitoring, research, general administration and staff salaries* (Figure 3). The 'other' category comprises a variety of miscellaneous activities, including rehabilitation of training centres and specific poverty reduction projects (Fisheries Development Project and Agriculture Input Support Programme). Although *fisheries research stations* are depicted separately from the DoF in the Financial Reports they are managed by the DoF; their allocation is included in Figure 3, but they are analysed separately below to highlight specific points of interest.

Figure 3: Allocation to functional areas



*2003 does not include US\$4,450,000 allocated to the rehabilitation of training centres

Source: Own analysis, MoFNP Financial Report 2002-2007

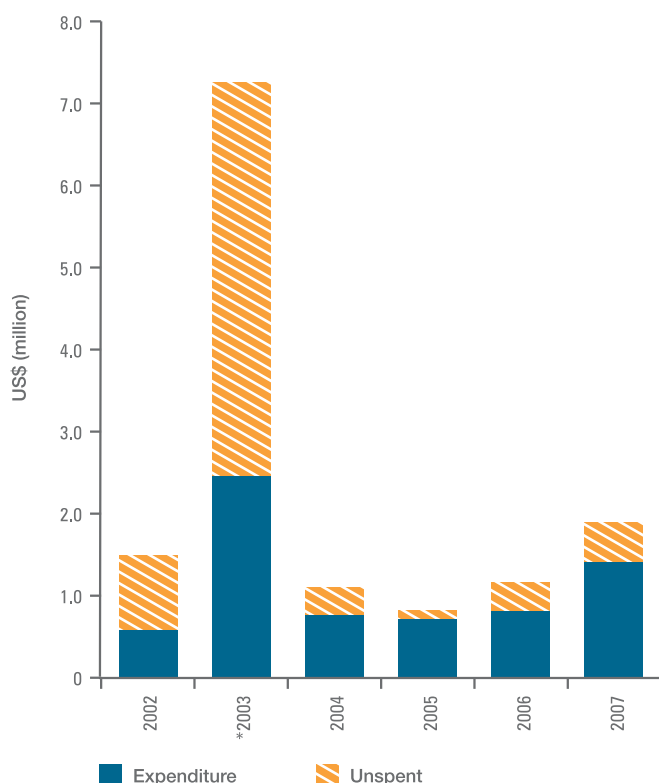
¹⁷ Own analysis 2008, average of 6 years (2002-2007). Source: National Budget

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The largest proportion of allocation (Figure 3) is to *salaries* and *general administration* which, when combined, account for over 60 percent of the total (except in 2003 when they are approximately 10 percent due to the US\$4.5 m allocated to rehabilitate training centres). In terms of amounts, allocation ranges between US\$550,000 and US\$1,300,000 with consistent increases since 2005. Allocations for *research*, encompassing limnological studies, post-harvest studies, processing trials and biodiversity analyses are less than 1 percent, and in amount range between US\$3,500 to US\$7,500 (too small to be reflected in Figure 3), in part explained by the fact that *fisheries research stations* are a separate budget item. Allocations for *monitoring* (surveillance and enforcement, monitoring and evaluation of licensing, enforcement of fish ban, frame surveys and catch and effort surveys), at between US\$22,000 and US\$233,000, make up less than 4 percent of allocation from 2002 to 2006 but are 12.4 percent of the total in 2007.

Figure 4: Department spending



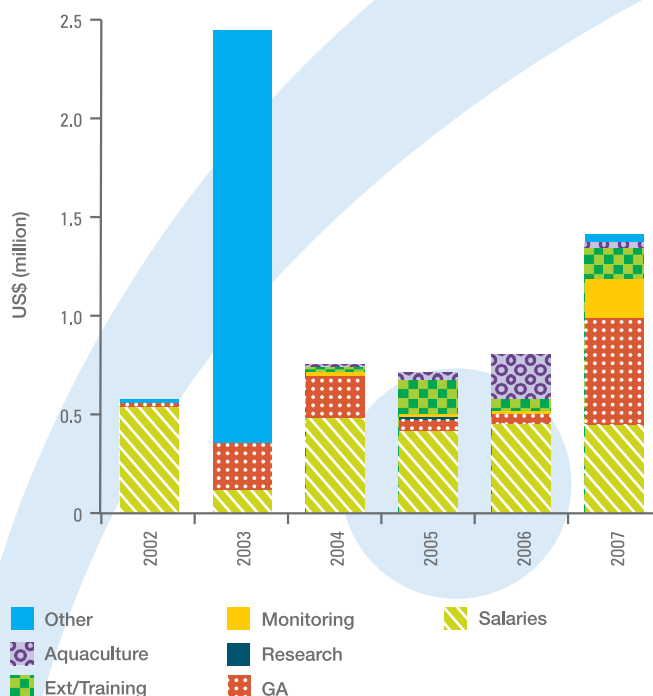
*2003 includes US\$4,450,000 allocated for the rehabilitation of training centres

Source: Financial Report 2002-2007

Funding for *extension and training* has been maintained at approximately US\$195,000, and makes up between 10 and 24 percent of the total. Allocations to aquaculture have been variable: in 2004, US\$22,000 was allocated for *aquaculture research* (one-off allocation) and US\$77,000 for *aquaculture development*. The latter increasing tenfold between 2005 and 2006 (US\$34,000 and US\$341,000) before a decline to US\$59,000 in 2007; and in terms of proportion between 4 and 30 percent. High levels of inter-annual variation in absolute amounts and lack of consistency in proportion of budget allocations makes it difficult to identify the main priority or clarify the long-term strategic plan for sector development.

Realizing the potential of the fisheries sector requires the efficient application of budget resources¹⁸. Over the last four years expenditures have improved to over 69 percent. Prior to this, expenditure was less than 50 percent (Figure 4). For example, significant resources allocated in 2002 and 2003 remained unspent, and *salaries* and *general administration* realize high levels of expenditures (Figure 5). In 2003 expenditures for *salaries* are 26 percent over budget, although low compared to previous and subsequent years. Other categories show high variability, with *monitoring* for example between 20 and 83 percent. Nonetheless, explicit

Figure 5: Functional area spending



Source: Financial Report 2002-2007

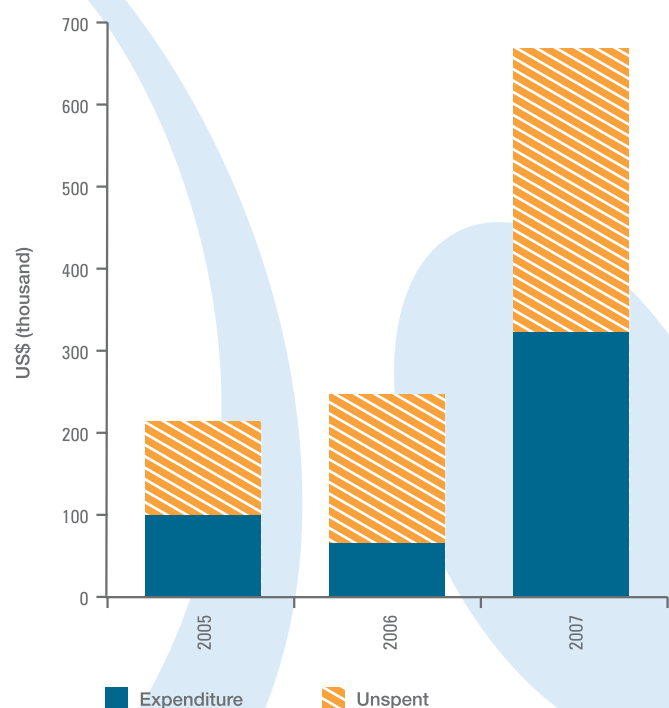
¹⁸ There has been limited *on-budget* donor support to the sector over the study period. Expenditures therefore reflect actual expenditure in relation to allocation

inclusion of allocations for *research, extension and training, aquaculture, and monitoring* since 2004 reflects an increasing recognition of the importance of these functions and indicates a level of commitment to overall improvement of the sector.

In line with its commitment to *research and monitoring* across the country, the DoF manages approximately 21 *fisheries research stations*. Although the budget for the stations is 73, 79 and 65 percent smaller than that for the department's other functions in 2005, 2006 and 2007 respectively, it has been increasing. Allocations to these institutions supports *monitoring* (frame surveys, gillnet surveys, catch assessments), *research* (fish seed propagation, feed formulation, biodiversity studies), and *general administration*, with *salaries* seemingly allocated centrally under DoF. Allocation is generally equally spread across the three categories in 2005 and 2006 but *general administration* is nearly 50 percent of the allocation in 2007. Aquaculture is the main focus for research; the stations are not explicitly itemized prior to 2005.

There remain many constraints to realizing the potential contribution of *fisheries research stations*. The expenditure of resources allocated to support them display consistently low levels (Figure 6).

Figure 6: Research station spending



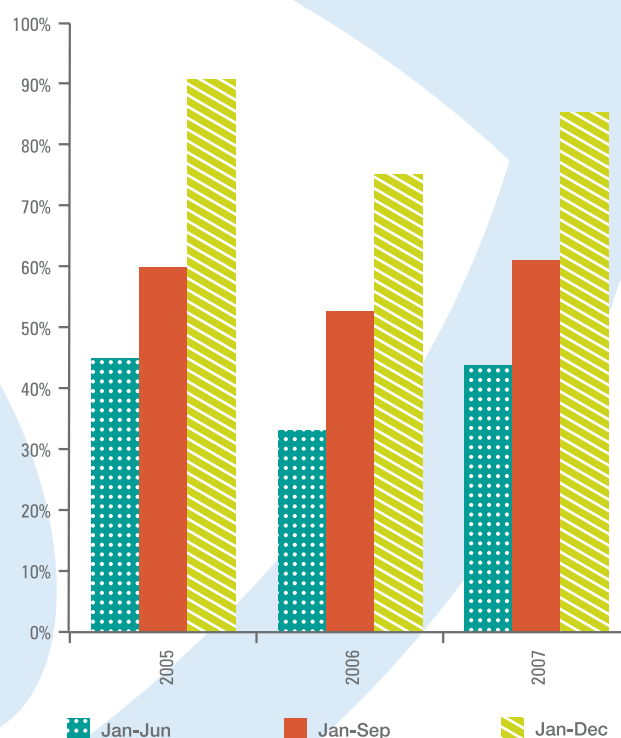
Source: Financial Report 2002-2007

Frame surveys of the country's main fisheries are a major tool for keeping a national inventory of the sector. However, due to funding constraints, frame surveys have not been consistently undertaken over the last few decades resulting in major data gaps that impede the explanation of basic trends. While there has been a fresh round of frame surveys in 2005/6 up to 2008, these have not been done uniformly and in parts rely on older data. Ideally, complete frame surveys should be conducted every three to five years to provide up-to-date planning figures.

Low expenditures may be attributed to insufficient capacity, limited budget implementation periods and weak administrative processes within the sub-sector. A strategic program of coordinated actions within a national research framework to support the effective mobilization of resources could realize substantive impacts within the sector.

Details on releases at the department level show that less than 50 percent of the allocation is released by the month of June for the years 2005-2007 (Figure 7). At least half of the resources are typically only available by September in any given year. The third quarter is when most spending agencies prepare to make retirements to the treasury; however, releases continue to be made, particularly for salaries, and in most years the DoF by year-end has received at least 70 percent of the total allocation.

Figure 7: Releases to Department



Source: MoFNP Statistics

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The sector generates public revenues at different levels of government including local and district councils as well as central government. In addition, in most cases fisheries contribute to informal revenue collection through traditional leaders. Aggregated revenue figures are not being collated and overall public revenues from fisheries are not known. Capacity for revenue collection is very limited, in particular by central government. In 2008, the Department of Fisheries collected revenues from license fees in excess of ZMK1 billion, without having had capacity for a systematic and comprehensive collection. It is assumed that potential revenues from central government fees alone are worth several billions and that levies to local and district councils surpass this amount significantly.

A variety of organizations¹⁹ support the sector (mainly off-budget) through various activities ranging from technical assistance to advocacy. Government remains the principal authority and main source of funding for the sector. Two of the Government's major initiatives have been the Fisheries Development Project (1984-1991)²⁰, which aimed to support the national strategy for agricultural development by increasing fish supplies and strengthening key institutions in the sector, through provision of credit to artisan and commercial fishermen for fish production and fish marketing facilities, foreign exchange assistance for manufacture of nets, and technical assistance. In addition was the Agricultural Sector Investment Programme (1995-2001)²⁰, which tried to improve the sector by increasing fish production, improving fish conservation awareness, improving the economic status and condition of small-scale fishermen and traders, and advocating the development of commercial aquaculture. However, achievement of the broad objectives of both initiatives are generally perceived to have been unsatisfactory. Although significant, budgetary allocation and expenditure by Government is only one among many factors with a bearing on the performance of the fisheries sector. Other factors include: the sector's governance structures, legal frameworks, levels of cooperation and trust between different stakeholders, and capacity for effective sector management at all levels.

Governance

The Fisheries Act, No. 21 of 1974 was until recently the principal legal instrument governing development and control of the national fisheries sector. It provided for: authorization and prohibition of specific fishing methods; designation of areas (for recreational, subsistence, research, or commercial fishing); registration of fishers and fishing craft in commercial fishing areas; prohibition of non-native fish introduction to any water, or import of live fish without authorization; and

appointment of Fishing Development Committees to coordinate and improve commercial fishing. The Act however provided no specific regulations to govern the development and management of aquaculture.

In 2007, the Government passed the Fisheries (Amendment) Act of 2007 with the objective to improve the involvement of riparian communities in fisheries management, promote development of the aquaculture sector, and establish a Fisheries Development Fund. Under the new Act, each fishery will be designated a Fisheries Management Area, and run by a Fisheries Management Committee. The Committee will oversee the development and implementation of a Fisheries Management Plan at the level of the fishery and will administer a fund to increase the welfare of riparian communities. The Minister responsible for fisheries retains the authority to appoint members of Committee from among main stakeholder groups and to regulate the payment of local fisheries revenues into this fund.

The Act also provides for the establishment of a Fisheries Development Fund at national level to support the development of the fisheries and aquaculture sector and facilitate a community based approach to fisheries management. The Fund is to be supported by resources appropriated by Government, with 50 percent of funds to be collected from fishing and aquaculture licences and other fees applicable under the law. The Act further provides for an Aquaculture Development Plan to be prepared every three years to guide the sustainable development of the aquaculture sector. The Plan will identify national sectoral objectives and targets and will specifically describe aquaculture zones, production systems and aquaculture species to be promoted.

As part of the Fisheries Act, Government of Zambia further introduced new Aquaculture Regulations in 2007 that establish a National Aquaculture Committee under the Department of Fisheries and comprising representatives across relevant government ministries, private sector and the Environmental Council of Zambia. Specific regulations concern the zoning of aquaculture areas, licensing, environmental protection, control of fish diseases, and the movement, importation and exportation of fish.

The cross sectoral nature of water resources management and development and the need to allocate water among various competing users requires a strong integrated approach supported by equitable allocation frameworks and legislative provisions. The draft Water Bill, currently under consideration, proposes a broad range of changes to realign the institutional arrangements towards the objectives of Integrated Water Resources Management, including

¹⁹ UNDP, UNHCR, USAID, JICA, NORAD, FAO, The World Bank and The WorldFish Center

²⁰ Supported by The World Bank

provisions for regional cooperation and the equitable and sustainable utilization of shared water resources. Furthermore, the Bill provides for decentralization of water management functions through the establishment of catchment councils, responsible for supervising and regulating the use of water, and water user associations to facilitate multi-sectoral stakeholder engagement.

Historically, the DoF was the only institution with the mandate to manage fisheries resources. This entailed sole responsibility for policing the resource and enforcing regulation over extensive areas as well as monitoring activities in highly scattered fishing settlements. Limited resources available for enforcement meant that generally the DoF had only token presence in most fisheries, except during the annual closed season (1st

December to 28th February) when the department makes a concerted effort to enforce the ban on fishing activities. Over the last 15-20 years the DoF has started to share responsibility through co-management²¹. Communities, traditional leaders and associations have taken on management roles in a number of fisheries. The starting points, objectives, modalities and results of these initiatives have varied from place to place (Box 2). In the context of Zambia's continued commitment to decentralization and within the framework of the Fisheries (Amendment) Act, the fisheries sector needs to develop and implement a comprehensive approach to co-management. This will be part of the National Fisheries Policy currently under development.

Box 2: Fisheries Co-management Initiatives

1. Lake Mweru/Luapula: Fishing Association formed by fishermen themselves (1986 - present)

Objectives:

- To stop gear theft (initial objective)
- Conservation concerns
- Social function

Participation:

- Membership was only open to fisher folk
- Excluded Traditional Authorities and District Councils. DoF did not take an active role

Outcomes:

- Limited capacity/support, especially financial
- Traditional Authority felt both undermined and threatened
- Local Authorities declined to give up any revenue generated from trade levies and licensing, nor did they recognize Association as it had no legal backing

2. Lake Mweru/Luapula: Conservation and Management Action Programme (1992 - present)

Initiated by DoF

Objective:

- To promote conservation dialogue

Outcomes:

- Tensions between various stakeholders persist

3. Lake Kariba²²: Establishment of Zonal Management Committees (after Fishing Zones designated) (1993/94 - present)

Participation:

- Facilitated by DoF but based on interest and cooperation of Traditional Authorities and commercial kapenta producers

- All stakeholders: DoF, fishers, Traditional Authorities, District Councils, NGOs and businessmen represented
- Delegation of responsibility to appropriate level: for example, artisan fishers given authority to control access and enforce regulations within established fishing settlements; Local Authorities enabled to provide services to fishing communities such as schools and clinics

Objectives:

- Reduce conflict
- Reduce number of foreign inshore fishers
- Stop theft of kapenta from commercial vessels by inshore fishers

Outcomes:

- Relocation and establishment of new settlements achieved
- Reduction of fishing camps from 278 (1993) to 67 (1995)²³
- Total number of fishermen declined
- Traditional leaders reclaimed some authority

Many ambiguities and unresolved issues remain:

- Significant numbers of offshore fishermen resented the changes made (closing off the islands)
- Promises made to indigenous community not kept (social services, access to land)
- Local government reluctant to part with any portion of levies, and government had no capacity to support
- Various stakeholders lost faith
- Lake not exploited to full potential

²¹ Co-management is generally adopted as a solution to problems of falling catches, limited resources for enforcement and poor living conditions of fishers and their families

²² Til & Banda (2002) argue that the Kariba model works by virtue of the fact that most fishers are alien and thus more malleable, in contrast to other fisheries where fisherfolk and Traditional Authorities have a historical claim on the resources, and associated authority. Source: Til, J.B., & Banda, M.G. (2002). Co-managing the Bangweulu Fishery. In Gawler, M. (ed.) Strategies for wise use of wetlands: best practices in participatory management. In Mweru/Luapula for example, some chiefs have personal lagoons not subject to seasonal closure (Malasha, 2007) Fisheries Co-management: the Zambian Experience. Conference paper

²³ Source: Jul-Larsen, E., 2004. An analysis of effort dynamics in the Zambian inshore fisheries of Lake Kariba, In Jul-Larsen, E. et al. (eds), Management, co-management or no management? Major dilemmas in Southern African freshwater fisheries: Case Studies. Rome, FAO

FISHERIES IN ZAMBIA:

AN UNDERVALUED CONTRIBUTOR TO POVERTY REDUCTION

Limited financial resources have resulted in many initiatives, although spearheaded by DoF, being supported by donor funding. These include the Zambia-Zimbabwe SADC Fisheries Project on Lake Kariba (NORAD and DANIDA), the Conservation and Management Action Programme on Lake Mweru/Luapula²⁴ (SNV), and the fisheries component under the current Programme for Luapula Agriculture and Rural Development (PLARD) (Finland). While these projects include explicit capacity building components for DoF and other agencies, they have on the whole not been able to substitute for long-term capacity building in strategic areas.

Analysis and Discussion

The Fifth National Development Plan (FNDP) outlines the Government's strategy for inclusive growth and development for the period of 2006-2010. The primary theme of the FNDP is "broad-based wealth and job creation through citizenry participation and technological advancement" through a multi-sectoral strategy that will increase annual growth to 7 percent, sustaining it at that level, and making the growth more diversified as well as more inclusive. The specific goals for the fisheries sub-sector over this period are aimed at promoting community-based resource management of capture fisheries, aquaculture development and the restocking of natural water bodies with fish seed, along with better processing facilities and improvements in the distribution network.

To realize these goals, the Government has adopted a more systematic approach to the fisheries sector. The new Fisheries (Amendment) Act of 2007 is an important step, and the current development of a National Fisheries Policy and Aquaculture Strategy is building on this. Yet, substantial challenges remain to translate the current political momentum into socio-economic benefits. Zambia has the potential to substantially increase the economic value of its capture fisheries in response to regional and national market demand, as well as develop a diversified and sustainable aquaculture sector. At present, production does not meet the estimated national requirement, estimated at 100,000 tonnes.

To fully realize this potential, targeted investments are required from a range of stakeholders and the Government needs to provide an overall policy environment that will stimulate these investments. The roles and responsibilities of Government, private sector, communities and civil society in developing fisheries and aquaculture have to be well defined and supported through capacity strengthening. For example, institutions like the Environmental Council of Zambia (ECZ), currently have no procedure to regulate or assess the impact of aquaculture developments, other than general provisions under Environmental Impact Assessments.

Within Government, linkages between fisheries/aquaculture and other sector investments are still not well coordinated. This applies to the water and energy sectors, as well as to agriculture, roads, health, education, local government and other sectors. Over the years, development of water resource related infrastructure has been driven by single purpose use. For example, the construction of dams, either for irrigation and/or hydropower, has failed to fully realize the potential contributions from and impacts on the fisheries sector. An integrating legal framework based on principles of integrated water resources management is needed to realize opportunities for equitable and sustainable development of the country's abundant water resources.

Furthermore, linkages between health and fisheries have not been exploited. While fish is important for food and nutrition security and income, people in fishing communities are at high risk of HIV/AIDS and other diseases. Health and hygiene are generally poor and there is a lack of health, educational, financial and other services, especially in remote fishing camps. Additionally, mobility and migration pose a challenge to reach fishing communities with the required services, especially in Anti Retroviral Treatment (ART) follow-up. Efforts have been made by civil society to fill these gaps, but there is need for a coordinated, multi-sectoral response to HIV/AIDS and other health challenges in Zambia's fisheries.

Diseases and stunting brought about by poor nutrition are prevalent throughout Zambia. The nutritional value of fish and fish products in human nutrition has been underestimated and not utilized to its full potential. Especially in the national response to HIV and AIDS, integration of fish in nutrition education and healthcare, especially for people on ART, has not been fully recognized and applied.

Capture fisheries and aquaculture, while linked, require quite different strategies for growth and development. In the aquaculture sector, increasing national production from the current 5,000 mt to 100,000 mt over the next 10 to 15 years seems a realistic target if clear strategic measures are implemented. Facilitating private sector investment in a range of production systems, input industries and services, and providing public sector support through policies, regulations and strategic capacity building are some of the key requirements.

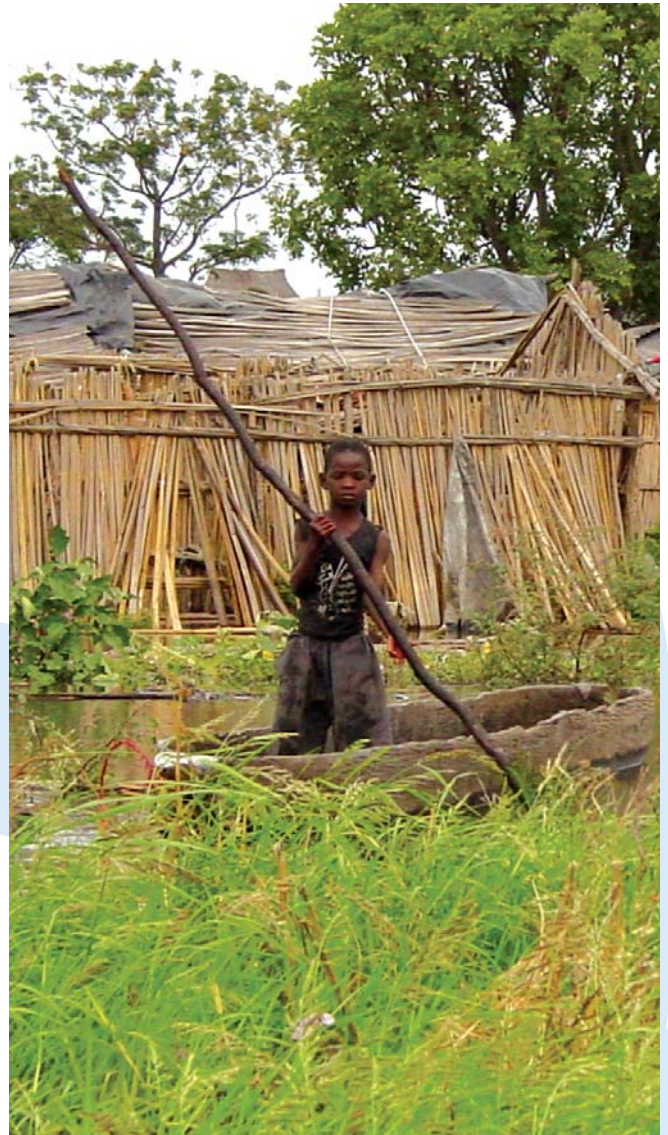
In the case of capture fisheries, overall production targets are difficult to define or monitor given the technical conditions of tropical multi-species fisheries and the diffused, informal nature of the sector in the country. These conditions provide Zambia with a strength that will help ensure the resilience of these fisheries and the continuation of socio-economic benefit flows. Planning for the future of the capture fisheries sector will require a better and quantified understanding of

²⁴ Malasha, 2007

the types of benefits generated and types of stakeholders involved, and analysis of entry points for economic investments such as in the post-harvest and marketing sector. The picture will likely be complex and solutions will differ from one fishery to another, requiring flexible approaches to sector development and highlighting the important role of decentralized planning.

Although still limited, Government allocation to the sector has increased over recent years. This is an encouraging sign of increased recognition of the sector's potential. On the other hand, key strategic functions such as research and monitoring continue to be under-invested even as allocations increase. Very substantial investments are needed in these areas to strengthen the capacity of the Department of Fisheries and other mandated institutions to carry out research, monitoring and surveillance. This also applies to the aquaculture sector which suffers from a lack of quality control of inputs (in particular fish seed) as well as of production systems and low capacity for impact monitoring.

The new Fisheries (Amendment) Act in principle provides a conducive framework for such an investment planning and management approach. It should be a priority, through a strategic piloting scheme, to establish 'good practice' for implementing key provisions in the Act, in particular Fisheries Development Funds and Management Plans at decentralized levels. However, the challenges facing the sector are far from being technical alone, but also relate to management and human resource capacities. Nevertheless, these challenges should not detract from recognizing the need to harness the sectors potential to contribute to development and poverty reduction in Zambia.



FISHERIES IN ZAMBIA:

AN UNDERVALUED CONTRIBUTOR TO POVERTY REDUCTION

Recommendations

Policy

- A National Action Plan is needed to operationalize legislative provisions and strengthen the effective mobilization and implementation of available resources.
- Fishery-level Management Plans, as envisaged in the Fisheries (Amendment) Act, should be developed through a phased program focusing on priority fisheries and allowing country-wide application of lessons. Stakeholders at appropriate levels require capacity strengthening to contribute effectively to this important process.
- A National Fisheries Forum should be established to provide a platform for dialogue on priority fisheries and aquaculture development challenges among a wide range of stakeholders, including private industry, government agencies from all relevant sectors, civil society, local authorities and traditional leaders.
- Sustainable financing mechanisms are needed to ensure revenues in the fisheries sector are recognized and re-invested purposefully. Government support to the establishment and management of Fisheries Development Funds as provided in the Fisheries (Amendment) Act should be aligned to the development and phased implementation of the Fishery-level Management Plans.
- An integrated approach to fisheries, agriculture, water and other sectors should be adopted, along with a water resources bill to provide an embracing framework for Integrated Water Resources Management and Development.

Capture fisheries

- Research and monitoring functions need to be consolidated to provide an effective information management platform to facilitate national and fishery-specific planning and sector management. Current national fisheries management measures need to be reviewed to assess their costs and benefits in light of new knowledge. This will need to inform the development of new management options arising from the Fisheries (Amendment) Act and other Government policies.
- Infrastructure and service delivery plans need to be developed for each major fishery and linked to district development plans to facilitate effective cross-sectoral investment planning.
- A strategic approach is required to secure the sector's wider human resources needs and to ensure that the sector's food security and health contributions are being realized. Effective linkages between fisheries and other relevant sectors are essential.
- The economic value of the sector needs to be increased through investments in innovative post-harvest

management and development of more diversified product ranges from Zambia's wild fish production.

- Community-based fisheries management needs to be strengthened through support to effective participation of communities in sector-specific planning and monitoring and by closely integrating local fisheries plans and institutions into wider local government and community institutions.

Aquaculture

- Financial products and services specific to the aquaculture sub-sector need to be developed within the banking sector to increase investments in aquaculture production capacity and service sectors.
- Priority aquaculture zones need to be identified and an integrated management approach adopted to broaden the benefit base, manage environmental and socio-economic risks and address institutional requirements for aquaculture development.
- Integration of aquaculture in the context of small-scale water resources development needs to be supported at the community and household level where economic momentum exists, with a focus on multi-purpose use directed towards increasing food security and reducing livelihood vulnerability.
- Facilitate technical support programs for the development and dissemination of sustainable aquaculture technologies to increase productivity of the sector and safeguard public goods in the areas of biodiversity and consumer safety.
- Provide a conducive environment for the development of large-scale, commercial aquaculture through appropriate regulations, capacity strengthening of key institutions such as the Department of Fisheries, the Environmental Council of Zambia and the National Aquaculture Association of Zambia to deliver well-defined services.

Markets and trade

- Infrastructure development is needed to support local, national and regional fish trade and encourage private sector investments in diversified market chains.
- Increased product diversification and improved targeting of diverse markets from capture fisheries and aquaculture needs to be encouraged, including the development of a range of higher-quality products for the poor.
- Impact of expanding marketing and trade on national food and nutrition security needs to be monitored.
- Technical and financial services for processors and traders need to be strengthened to safeguard economic opportunities and increase returns for micro, small and medium scale enterprises.

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