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The water situation in Harare, Zimbabwe: a policy and management problem

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Abstract

Harare, the capital city of Zimbabwe, is facing water quantity and quality problems, with serious pollution of the downstream Lake Chivero. Often, these problems are attributed to rapid population growth, inadequate maintenance of wastewater treatment plants, expensive technologies and a poor institutional framework. Rampant urban agriculture could also result in washing off and leaching of nutrients. This paper brings out a number of issues related to sustainable water management in Harare. The study was based on key informant interviews, focus group discussions and a literature review.

The results show that monitoring and enforcement of regulations in Harare is poor because of economic hardships and lack of political will to deal with offenders. Also, there is irregular collection of garbage, low fines owing to hyper-inflation and a general failure by the city to collect water and other charges from residents. The city has also failed to raise tariffs to economic levels owing to heavy lobbying by residents and interference by government. It was concluded that Harare cannot overcome its water-related problems under the current set-up. It is recommended that a corporatised body, free from political influence and with a higher degree of autonomy, be established to run the water services for Harare and the neighbouring towns. Such a body would need a sound and flexible system for setting tariffs and enacting/enforcing reasonable regulations.

Keywords: Harare; Institutional aspects; Intervention strategies; Urban water management; Wastewater treatment; Water losses; Water quality

1. Introduction

Water governance and institutional dimensions are central to the discussions on urban water management as these also affect the technical performance of the sector. This paper looks at water management in Harare, Zimbabwe where a number of problems have been documented (Marshall & Falconer, 1973; Thornton & Nduku, 1982; JICA, 1996; Moyo, 1997), yet these efforts have contributed little to solving the perennial water supply problems. The paper starts by looking at the water resources

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and utilisation in Harare with the first objective being to assess the quantitative and qualitative aspects of the problem. This part uses data collected from literature, the City of Harare, the Zimbabwe National Water Authority (ZINWA) and two water crisis conferences held in the year 2003 (Environment Africa, 2003). The second objective was to assess how the institutional set-up has responded or contributed to the problem. It is argued that whilst technical problems do exist, these have been compounded by an unresponsive institutional structure. Issues dealt with in this paper are political will, infrastructure planning and funding issues, institutional framework, regulatory framework and governance (pricing mechanism, revenue collection, community participation).

2. Background to the water problems in Harare

2.1. Geographical aspects

Harare is the capital city of Zimbabwe (Figure 1) and is located upstream of Lake Chivero (Figure 2). The lake's catchment area also includes the towns of Chitungwiza, Epworth and Ruwa. The Chivero catchment is also a sub-catchment of the larger Upper Manyame catchment, which includes the town of Norton. The entire Chivero catchment has an estimated population of about 2.5 million people (CSO, 2002) and covers a surface area of about 2,220 km^2 (Department of Water records), consisting of approximately 10% urban and 90% rural developments. The latter comprises communal and commercial farming lands in nearly equal proportions. The lake, created via a dam constructed in 1952, is located about 35 km south-west and downstream of Harare (Figure 2). Lake Chivero was designed for a full capacity surface area of 26.5 km^2, a volume of 247,181,000 m^3 and a mean depth of 9.3 m, with the deepest point measuring about 27 m. The lake overflow level is at 1,368 m above mean sea level. Lake Chivero receives water from the following major rivers: Manyame, Mukuvisi and Marimba. The Ruwa and Nyatsime Rivers feed into the Manyame River and they drain the towns of Ruwa and Chitungwiza, respectively. Marimba and Mukuvisi Rivers drain most parts of Harare. Five wastewater treatment works and two water treatment works are found in the Lake Chivero catchment. The Harare city council treats and supplies water to all the towns in the Chivero catchment (and also Norton) and plays a major role in water quality management in the area. Harare as a town was established around 1890 and some of the current infrastructure is as old.

2.2. Water resources and pollution in the Harare metropolitan area

A detailed study of water and nutrient flows in the Chivero catchment was done by Nhapi *et al.* (2006) and a summary of this is shown in Figure 3. The major highlight from this study is that the total nitrogen (TN) and total phosphorus (TP) levels in Lake Chivero have reached critical levels considering that the lake supplies drinking water to a very large population. Further details and highlights of the components are briefly described below.

2.2.1. Surface water resources. The rainfall pattern for the Chivero catchment varies greatly in time and in space, with an average precipitation of around 830 mm per annum, based on data from 18 gauging stations in the catchment. The spillway at Lake Chivero rarely releases water in the dry months of July to November (Figure 4(a)) while lake inflows are observed throughout the year. There are no regulated

Fig. 1. Map of Zimbabwe showing the location of Harare. The insert shows the location of Zimbabwe in Africa.

outflows from Lake Chivero into the Manyame River as the floodgates are permanently closed. The lake inflow/outflow regime therefore mainly dictates seasonal water quality and, to some extent, the self-purification capacity of feeding rivers and of the lake itself. The Chivero catchment receives a total of about $1.8 \times 10^9\,m^3$/yr of rainfall (translating to $750\,m^3$/capita.yr), of which $0.29 \times 10^9\,m^3$/yr (16%) flows into Lake Chivero. Some of the water is abstracted, treated and used in towns after which it returns to the lake as sewage effluent. Only about 30% of lake inflows are abstracted for urban use. The rest either evaporates or flows downstream where some of it is abstracted for agricultural irrigation. Raw water is also abstracted from the immediately downstream Lake Manyame. An assessment of the trend

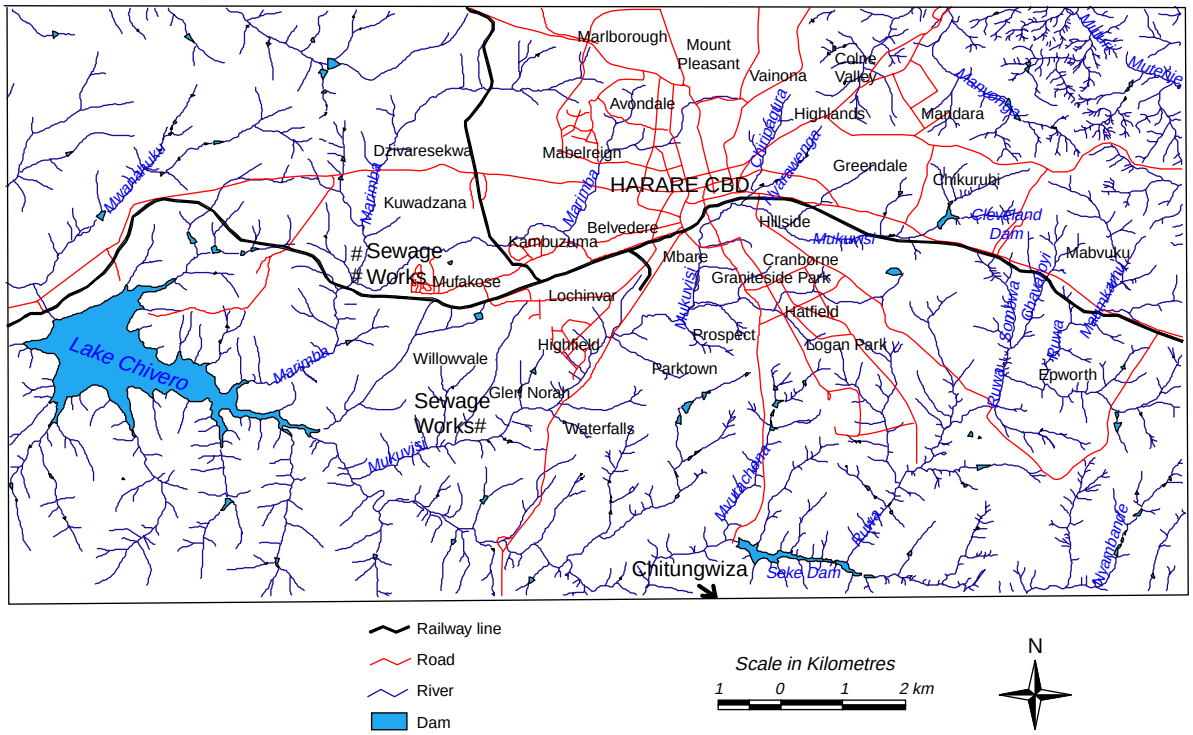

Fig. 2. Map of study area showing the location of Lake Chivero in relation to Harare (CBD = central business district).

in lake water levels shows that the volume of water in Lake Chivero goes down considerably during low rainfall years (Figure 4(b)), posing a potential threat to water security in the area.

A water balance analysis of Lake Chivero showed that the lake could sustain the provision of about 421,000 m^3/d of raw water without drawing down the lake (Figure 3). At current abstraction rates of about 416,000 m^3/d, the abstraction limit for Lake Chivero has now been reached and this is evidenced by rapid declines in the lake water level in the dry season.

2.3. Water abstraction, treatment and supply

The water supply scheme for Harare is shown in Figure 5. The Prince Edward and Morton Jaffray Water Treatment Works (WTWs) supply the Harare metropolitan area and have design capacities of 90,000 m^3/d and 614,000 m^3/d, respectively (JICA, 1996). Lake Chivero, although receiving the bulk of urban contamination, supplied 416,000 m^3/d (73%) of the total 544,000 m^3/d of raw water actually abstracted for the Harare metropolitan area in year 2003 (Figure 6). On the other hand, Lake Manyame (which receives little urban contamination) supplied only 84,000 m^3/d and the Seke dam supplied 44,000 m^3/d. It is more rational to increase abstractions from Lake Manyame, which is much larger than Chivero, with a volume of 480,236,000 m^3. The combined storage capacity of the Chivero/Manyame lakes therefore becomes 727,417,000 m^3. An analysis of abstraction trends shows that less and less water is being abstracted from Lake Manyame over the years (Figure 6) and this could be related to pumping capacity problems and pump breakdowns. At a projected water demand of 1,400,000 m^3/d by 2015

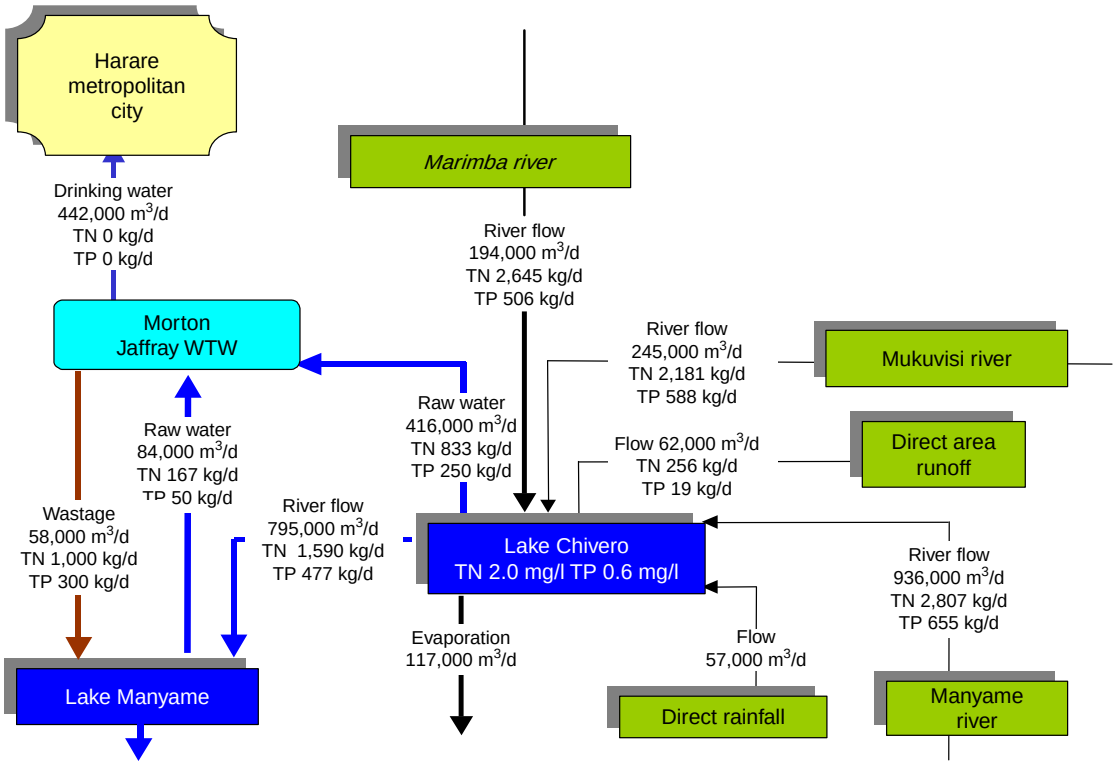

Fig. 3. Water and nutrient flows in the Chivero catchment (extracted from Nhapi *et al.*, 2006).

(JICA, 1996), or 70% of current annual storage capacity, water scarcity is not an immediate problem, but it will be a problem in future.

An investigation of water losses by the City of Harare revealed water losses of more than 30% in the distribution/reticulation system (City of Harare, 1996), mainly owing to ageing infrastructure. This value is expected to be very high by now as maintenance and rehabilitation works have been decreasing over the years. Water losses within the water treatment works (WTWs) for data up to July 2002 were 7 ± 3% for Prince Edward and 11 ± 6% for Morton Jaffray (Figure 7). The data from the City of Harare need to be approached with caution as most of the meters have not been working for a long time and yet they

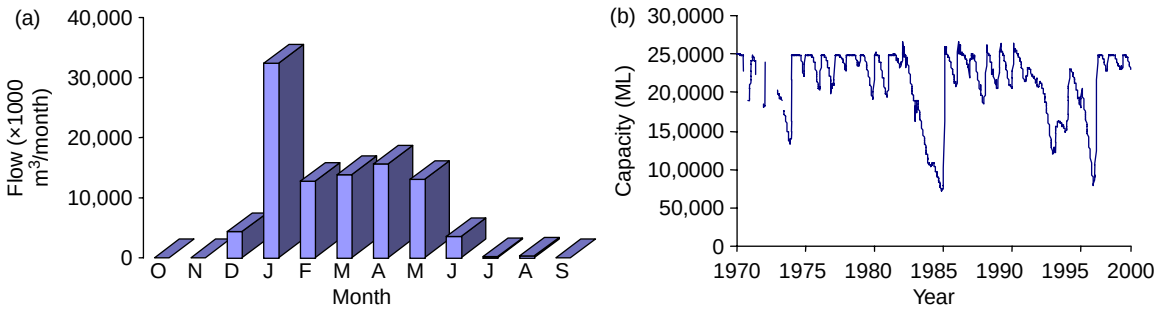

Fig. 4. Trends in water outflows from Lake Chivero: (a) average monthly flow pattern over the spillway (1990–2002) and (b) water volume variations in the Lake from 1970 (*data source*: ZINWA).

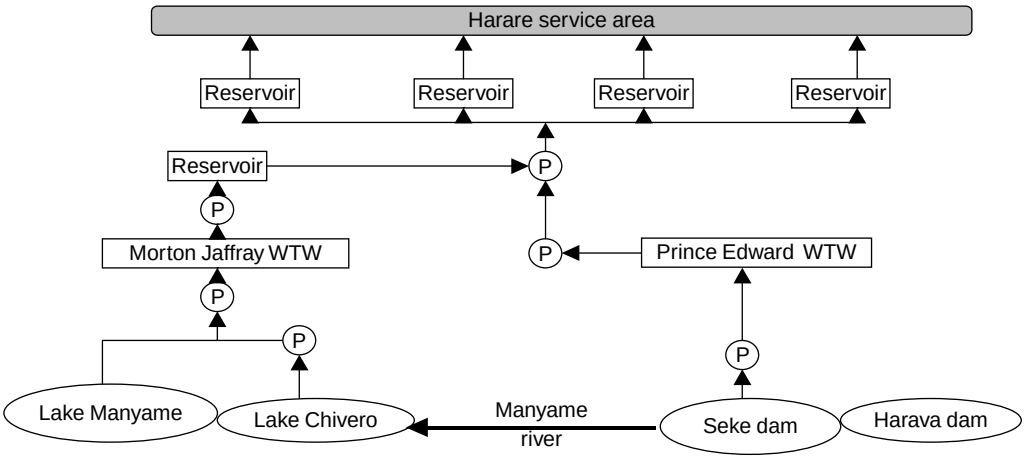

Fig. 5. Schematic layout of water supply system for the Harare metropolitan area (year 2005). (P = pump, WTW = water treatment works)

have flow readings covering these periods. An extrapolation from Figure 6(b) shows that the full capacity of the Morton Jaffray waterworks would be reached in 2008 whilst that for Prince Edward waterworks would be reached in 2012, assuming constant growth of demand. The current water demand for Harare is estimated at 750,000 m^3/d (City of Harare, personal communication), which is more than Harare is abstracting. A total of 544,000 m^3/d is abstracted and after losses in the treatment processes, 486,000 m^3/d is produced. After about 30% losses in the distribution/reticulation system (City of Harare, 1996), 340,000 m^3/d is potentially used. This situation means that there are frequent water supply disruptions to many areas, a situation that has raised political instability in the city and resulted in two mayors being dismissed within a space of four years. The household water consumption in Harare is too high and is the main cause of high water demand in the city. Reported water consumption figures are 630 l/capita.d for low density, 320 l/capita.d for medium and 80 l/capita.d for high-density residential areas (JICA, 1996). Nhapi & Hoko (2004) have shown that water demand measures could reduce current water demand in Harare by more than 20%. The measures proposed include water reuse and recycling, rainwater harvesting, use of borehole water where possible and use of water-saving devices.

2.4. Wastewater disposal and water pollution

The existing wastewater treatment plants in Harare are overloaded. The total design capacity of these plants is 208,000 m^3/d compared to total current inflows of about 300,000 m^3/d, resulting in 44% overloading. This has serious implications for downstream water quality. The Hatcliffe and Marlborough sewage treatment plants in Harare discharge effluent from the Chivero catchment area. Lake Chivero receives large amounts of wastewater effluent and is prone to pollution discharges from urban and agricultural runoffs. In fact, there are no structures or regulations to control urban stormwater pollution effectively, which contributes about 50% of the pollution load discharged into Lake Chivero (Nhapi *et al.*, 2006). Lake Chivero has been heavily polluted and eutrophic from the late 1960s and its condition continues to deteriorate (Munro, 1966; Marshall & Falconer, 1973; Thornton, 1980; JICA, 1996; Nhapi *et al.*, 2001). The rapid increase in population in the lake's catchment area coupled with the

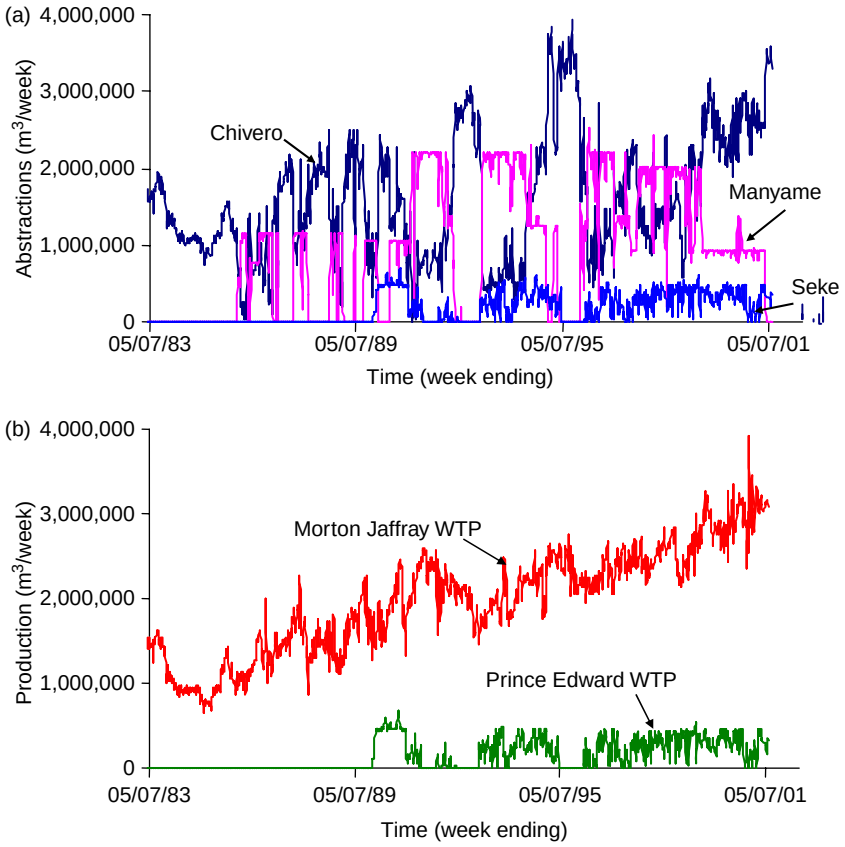

Fig. 6. Weekly water supply patterns for the Harare metropolitan area: (a) raw water abstractions from Chivero, Manyame and Seke dams and (b) potable water production from Morton Jaffray and Prince Edward waterworks (*data source*: City of Harare).

shortage of funds to extend and rehabilitate water supply and wastewater treatment infrastructure form a sustainability threat to Harare in terms of water quality and quantity.

A number of water quality and quantity studies have been carried out recently on different sections of the Chivero system (JICA, 1996; Moyo, 1997; Manjonjo, 1999; Kamudyariwa, 2000; Mawere, 2001). These studies revealed continuous deterioration in water quality for the rivers feeding into Lake Chivero. Also, studies on water quality in Lake Chivero showed a disturbing trend of deterioration (Figure 8), especially after the gains from remediation efforts in the late 1970s (Thornton & Nduku, 1982). A study by JICA (1996) found average nutrient levels in the lake of 0.54 mg/l TN and 0.27 mg/l TP. Since 1996, the phosphorus loads and water flows have changed substantially. Nhapi *et al.* (2004) reported average nutrient values ($\pm$ standard deviation) of 2.0 $\pm$ 1.3 mg/l TN and 0.6 $\pm$ 0.3 mg/l TP. The high nutrient levels have resulted in periodic fish kills owing to excessive ammonia levels and oxygen depletion. Other problems are water treatment difficulties and clogging of irrigation pipes caused by high content of algae in the lake water. Excessive weed growth has also interfered with navigation. The impact of poor water quality on the water treatment processes was reported in the early 1980s (Mckendrick, 1982) and is the primary reason why Harare prefers to look for another source of water supply from a "cleaner source" like Kunzvi Dam. The question of the exhaustion of the catchment yield does not appear valid as Lake

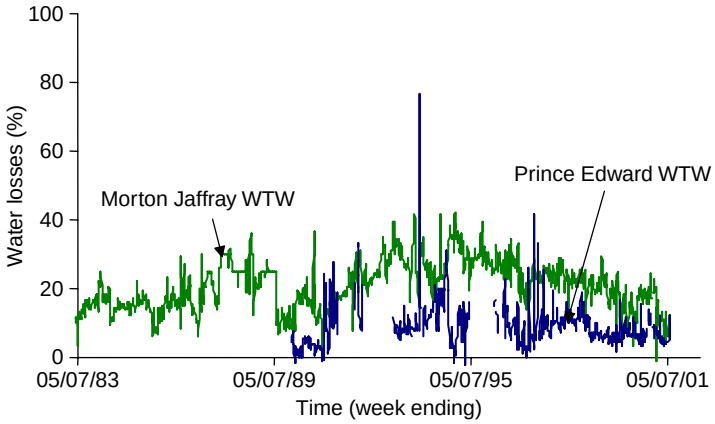

Fig. 7. Treatment plant losses at Morton Jaffray and Prince Edward waterworks from 1983 to 2002—unaccounted for as percentage of inflow (*data source*: City of Harare).

Manyame is nearby and Harare is not utilising the full capacity of its water treatment plants. The yield of the Kunzvi Dam is estimated at about 100,000 m^3/d, which is less than the water losses in Harare.

2.5. Summary of water problems in Harare

The water situation in Harare is given above from an engineering perspective. In summary, there are two basic challenges relating to water management in Harare. These are the long-term water scarcity problem and the immediate water quality problems in Lake Chivero. The current problems have been caused by rapid population growth after independence in 1980, inadequate rehabilitation and maintenance of water and wastewater treatment plants, expensive technologies (trickling filters and especially biological nutrient removal systems) and a poor institutional framework. Urban agriculture could be a major part of the problem in terms of washing off and leaching of nutrients, although there are no conclusive studies yet to quantify its impact. The starting point for Harare is to reduce the pollutant flows into Lake Chivero by properly managing the wastewater system. This starts from the reduction of

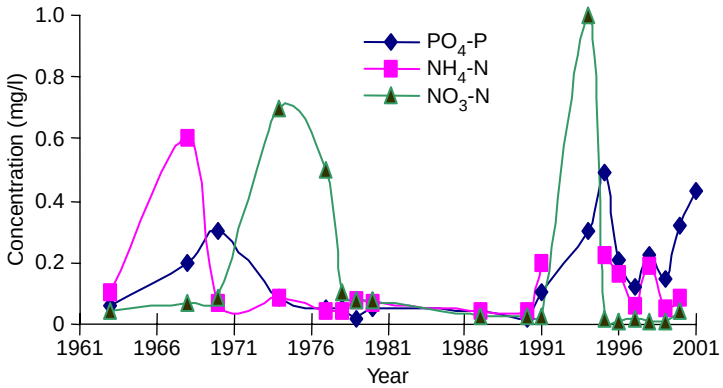

Fig. 8. Nutrient and flow variations recorded in Lake Chivero (*source*: Marshall, 1997; Nhapi *et al.*, 2001, 2004; City of Harare and Zimbabwe National Water Authority databases).

wastewater generation to the urgent rehabilitation of sewage treatment plants. The rivers need to be protected by ensuring that good quality effluent is discharged into them and controlling stormwater pollution.

The abstraction of water from the Chivero and Manyame dams needs to be optimised and the water treatment capacity extended to meet current and projected demand. The whole distribution and reticulation system should be rehabilitated and optimised through modern methods of network analysis and modelling. Harare has to quantify and deal decisively with water losses through a comprehensive leak detection and water loss reduction programme. All new developments should be co-ordinated and their impact on water quantity and quality assessed. Modelling methods are available to perform this task. A programme for the replacement of old pipes needs to be developed, budgeted for and implemented.

3. Institutional impediments to proper water management in Harare

3.1. Infrastructure planning and funding issues

Planned developments in Harare, especially the extension of sewage treatment works and the development of alternative sources of water, are lagging behind. The last upgrade of sewage treatment plants was in 1996 and since then the major plants are treating $>100{,}000\,m^3/d$ for Crowborough (design capacity $54{,}000\,m^3/d$) and Firle $>180{,}000\,m^3/d$ (design capacity $144{,}000\,m^3/d$). The total water treatment capacity is $704{,}000\,m^3/d$, which is almost equal to the current water demand. Neither will the development of the Kunzvi Dam solve much as only about $100{,}000\,m^3/d$ could be abstracted from this dam, barely enough to offset current water losses. The Harare city council would need affordable capital for these projects but the chances of getting this money are hampered by the failure to produce audited accounts since the late 1990s. Good corporate governance, as reflected by financial accountability, is a prerequisite for borrowing money from both the private and the public sector. There are also other competing needs as the city is currently failing to provide services in many areas such as social amenities, primary health care, refuse removal and traffic lights.

Zimbabwe is currently in severe economic recession with the inflation rate ranging between 120% and 1,730% since January 2004 (Figure 9). Lending interest rates have been following the same trend and the January 2007 Reserve Bank of Zimbabwe minimum lending rate was 500% (www.rbz.co.zw). This environment makes borrowing very expensive and unsustainable. Public enterprises would need access to cheaper funds. The government sometimes responds in an *ad hoc* manner by providing funds at $<100\%$ annual interest rate but the type of investment required in infrastructure development needs a longer time to plan and implement.

The ability of a water utility to finance its capital and operational expenditure depends on the granted degree of freedom to manage tariffs and investments if there are no subsidies from elsewhere. The government of Zimbabwe uses a "command" style of managing the economy and strictly controls tariffs by councils. Price controls are considered a major impediment to private sector investment in the water sector. Harare employs a rising block tariff system coupled with price differentials for different types of consumers. However, the average tariff is about US$0.10/m^3, which is lower than an internationally accepted level of US$0.75/m^3 (Franceys *et al.*, 1992). Even the tariffs charged by the Zimbabwe National Water Authority (ZINWA) are also low. The government has tried to suppress the tariff levels

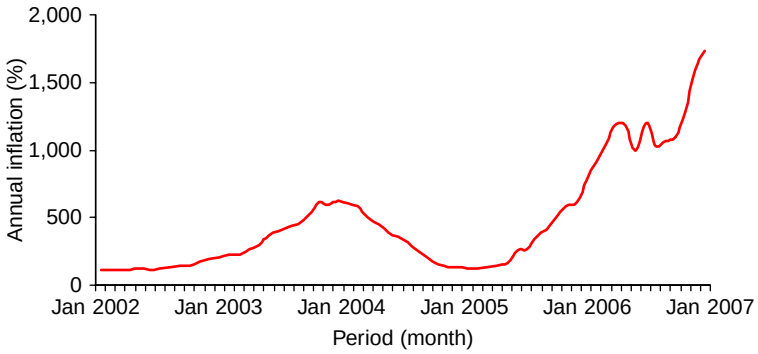

Fig. 9. Annual (year-on-year) inflation trends in Zimbabwe, Jan 2002 to Feb 2007 (*source*: Zimbabwe Central Statistical Office database).

by using a two-tier foreign exchange rate, with government-related organisations getting their foreign currency allocations at lower rates. However, since 1998 Zimbabwe has been facing severe foreign currency shortages and government allocations can no longer be guaranteed. The official exchange rates are often considered unrealistic, giving rise to a thriving parallel market where rates are often 2–10 times the official rate. Prices of most goods, including water treatment chemicals, are pegged using the parallel market rate despite government efforts to enforce price and exchange controls. This has a serious impact on council operations as it becomes impossible to break even.

The department or section dealing with water management needs to be strengthened and operate autonomously. Harare has always operated with less than 10 engineers dealing with water issues for a population of more than 2 million people and Harare has a ratio of about 1 engineer for 100,000 residents. A grouping of Zimbabwean local authority engineers believes this ratio should be about 1:20,000 for effective management. Water issues would be over-shadowed by other seemingly immediate issues in a town if there is no dedicated structure for this function, resulting in reduced budgets for water management. In May 2005, the government decided to place the function of water supply under a national water agency, ZINWA. From the on start, this decision appears to be stillborn. First, ZINWA has no experience in water supply for such a big city as it has been concentrating on water supply in small towns only, where it has traditionally struggled to perform. Second, ZINWA follows government procurement procedures and these are riddled with bureaucracy (and possibly corruption) when water supply requires quick decision-making at the operational and tactical levels. On the other hand, ZINWA is supposed to raise its own funds and this is difficult as the government will interfere with tariff-setting whilst also not providing enough funds for capital development. Third, the wastewater management function was initially left with the city council although it is the area that requires immediate attention as it has a direct impact on the water quality in the supply dams, resulting in more chemicals being required to purify the water (Mckendrick, 1982). Late in 2006 ZINWA took over the wastewater management function but it was already too late as investment and maintenance were already lagging behind. As pointed out already, water quality is the immediate problem that requires urgent capital investment whilst water supply could be resolved by using water demand measures. Water supply could also be improved by developing more treatment facilities to draw water from Lake Manyame after dealing with the current pollution issues. There are currently no conclusive studies to suggest that the yield of the Upper Manyame catchment will be exhausted soon.

3.2. Urban water governance and regulatory issues

Zimbabwe is one of the few countries in Africa still using the government or municipal system of water management. Most African countries have adopted different types of privatisation (Figure 10). The major disadvantage of the municipal system is that it is liable to constant political interference at the expense of efficiency, effectiveness and transparency in service provision. Figure 10 shows that most countries in Africa have changed to the public utility type of water management. It must be realized that efficiency is a must, because poor performance only hurts the poor as the rich have other coping mechanisms. Also, whatever the institutional arrangement; service provision must be subjected to regulation, which is often difficult when municipalities or the government is in charge. Utilities must therefore be accountable to the people they serve and not to political interests. The consumers should know what they are paying for, that is, there should be transparency in information sharing, production of annual reports including publishing of accounts, and so on.

Harare city council has been supplying water to the neighbouring towns of Chitungwiza, Epworth, Norton and Ruwa. The city decided on the tariff to charge these other towns and this tariff has been normally higher than Harare charges it own residents. There is obviously a need to involve these other towns in the planning and management of water in the area, as they are genuine stakeholders. The "unplanned" takeover by ZINWA will confuse the planning and management of water in the area and would eliminate the entry point for stakeholder participation. Two "Water Crisis" conferences were convened by Environment Africa (a non-governmental organisation) in March and December 2003. Since then, there have been visible efforts to engage stakeholders in seeking solutions to pollution and water shortages in Harare. A major outcome of these conferences was the establishment of "industrial

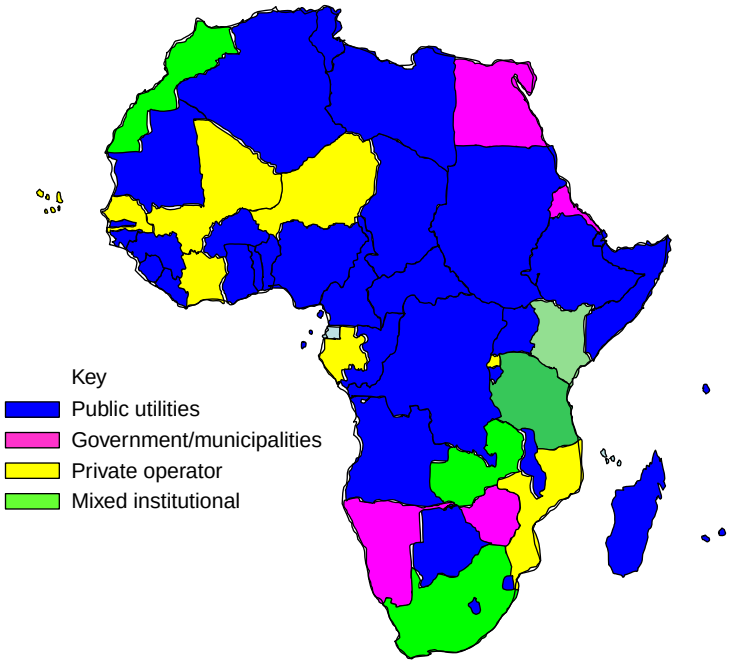

Fig. 10. Main institutional arrangements for water services provision in Africa (*source*: Mwanza, 2004).

clusters" by local industrialists aimed at water demand management and providing finance and technical backup to the council. This involved sourcing of spares and repairing of pumps. The gains of this development will be destroyed by the government's decision to transfer the water management function to ZINWA. It is likely that industrialists will find working with government bureaucrats frustrating, forcing them to withdraw their co-operation.

3.3. Institutional and political issues

The issue of water management in Harare should be shielded from party politics as it concerns the livelihoods of over two million citizens. It is well-known that given a choice between water supply and sewage treatment, politicians will choose water supply because residents can easily see the results. The major problem in Harare is sewage intrusions into Lake Chivero and this needs urgent attention and central government commitment. For example, a lot of illegal settlers were allowed to develop an unplanned settlement closer to Lake Chivero, further threatening the health of Harare's major source of potable water. Some of these settlers were removed by the government in June 2005 and returned two months later when the government decided to develop 9,000 residential stands in the area. This development totally ignored the need for sewage treatment facilities as the nearby Crowborough sewage plant is already overloaded.

The opposition-dominated Harare city council's operations have been crippled by government intervention. When it came into power in March 2002, the government immediately issued directives to the council to refer all decisions dealing with manpower and finances to it for approval before implementation. This meant that effectively the government was running the council's affairs. This was also followed by the enactment of the Public Order and Security Act. This act made it virtually impossible for opposition councillors to interact with their constituencies as all meetings required sanctioning by the police. The police would invariably refuse to sanction all opposition gatherings and demonstrations, including those on purely civic issues. On the other hand, government supporters are allowed to demonstrate at any time. With incidences of water shortages increasing, the city became ungovernable and the mayor (in 2003) and the majority of councillors (in 2004) were dismissed by the government on allegations of mismanagement and insubordination. A commission led by a few councillors who had defected from the opposition party was installed to run the affairs of the city at the end of the year 2004 and had its term of office extended several times thereafter.

A number of problems could be attributed to the state of affairs described above. First, political patronage started taking precedence over technical competency, result in in-fighting and low worker morale. Second, divisions in the workforce resulted in suspicions, forcing the council to guard closely information about its operations. For example, research and educational visits were discouraged by subjecting such requests to bureaucratic scrutiny and levying high charges for research permits. Most water and wastewater installations were declared high security zones where taking photos and unauthorised visits are strictly prohibited. Third, civic groups led by the Combined Harare Residents Association (a group considered to be inclined to the opposition) have lobbied against payment of rates, claiming "no taxation without representation". This would result in poor revenue collection by the city council, with the council owed billions by December 2006.

Most of the decisions taken concerning Harare's water problems are based on political expediency (Manzungu & Mabiza, 2004). Water problems have developed over the years and the solutions are well

documented. Since 2002, the government has appeared reluctant to fund the development of solutions because Harare city council was controlled by the opposition party. Instead, the government has introduced the post of Governor for the Harare metropolitan area, ostensibly to have a loyal channel for receiving government funds. Giving the money to the opposition council would be seen as propping up an opposition cause. However, the fact remained that the council was the only legitimate institution for local governance and also possessed the technical capacity to develop and run the water and wastewater systems. To overcome this, the government later decided to transfer the water management function to ZINWA, which does not have the required expertise to maintain the infrastructure and the mechanism to bill consumers. ZINWA's experience is in national water resources development with little involvement at municipal level.

The capacity of ZINWA to run water and wastewater systems in Harare and other towns should be rationally and critically analysed. Both ZINWA and the city council are statutory bodies with clear roles and responsibilities, especially regarding water supply and sanitation. Whilst water resources and its enabling legal instrument (Water Act of 1998 and ZINWA Act of 2000) are clear about the organisational structure and operational issues of ZINWA, the transfer of water supply and sanitation systems distorted this function. Urban water supply is a specialised field requiring a lot of technical input plus also stakeholder involvement, which is provided for in the formulation of council budgets according to the Urban Councils Act. The involvement of stakeholders in ZINWA operations is superficial through catchment councils. The representation and involvement of urban dwellers in catchment councils is very minimal as the entire city of more than 2 million people could be represented by two or so councillors. The new arrangement therefore marginalizes stakeholder participation, as urban water management is no longer confined to a clear catchment council. There is now no clear link between those managing the water for Harare and the Manyame Catchment Council under which Harare falls. As discussed earlier, Harare is currently discharging part of its wastewater into the Mazowe catchment and also has plans to abstract water from this catchment via the Kunzvi Dam project.

Questions would also be raised about ZINWA's capacity as an organisation to run the water services of Harare effectively. First, all the important functions of ZINWA are being directed and announced by the minister of water resources, raising doubts about ZINWA's originally intended semi-autonomy as a parastatal. Second, the role and qualifications of some body members is questionable, their appointment being based on political patronage. Besides stakeholders, the role of professionals (academics, lawyers, economists, engineers, scientists, etc) should be respected. Third, urban water management has other complimentary functions that ZINWA has left with the council and these would require considerable effort to synchronise with ZINWA's activities. These include garbage collection and disposal, sewer blockage clearing, controlling housing development standards, servicing of new housing estates, stormwater management, trade effluent control, and so on. Billing for water and sewerage charges would require a new team and accounting methods within ZINWA. Fourth, ZINWA is currently responsible for enforcing water quality and effluent standards and has been penalising the City of Harare heavily. It now remains to be seen how ZINWA is going to police itself as there is now a conflict of interests in its functions.

The issue of water pricing is not fully addressed in the current transformations of the management of water in Harare and other towns. Previously, water and sewerage charges were set by councillors in consultations with local residents and eventually approved by the minister of local government. The whole system was transparent in that residents knew all about council plans/budgets and would have a chance to contribute during the consultation processes or the advertisement for objections in

newspapers. ZINWA has no obligation to consult residents and there is now no-one to regulate water charges. Municipal councils were also using water charges as incentives to promote investment, something which ZINWA will not consider. Water was also provided freely in public places like toilets, recreational parks, and so on.

4. Conclusions and recommendations

4.1. Conclusions

1. Harare has enough water for its needs although water quantity will be a major problem soon.
2. Water quality is an urgent problem in Harare now and urgent measures to reduce pollution flows into Lake Chivero are required. These include proper treatment and diversion of sewage effluent from Lake Chivero.
3. The current institutional framework is to blame for the current problems in Harare as it does not promote effective planning/coordination, investment and management of urban water systems.

4.2. Recommendations

1. Zimbabwe should carry out a thorough study to establish the most suitable institutional framework for urban water management. Options include autonomous water boards and public–private partnerships.
2. Before this is done, town councils should be allowed to continue running their water and sanitation systems autonomously, with government assisting with finance for rehabilitation and other capital developments.
3. An enabling act is required, clearly spelling out the roles and responsibilities of the new institutional structure and dealing with the conflict points inherent in the current setup. ZINWA cannot policy its own activities.

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