



WWF

BRIEF

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# KAFUE FLATS, ZAMBIA: IMPORTANCE TO BUSINESS

## IMPORTANCE OF THE KAFUE RIVER TO ZAMBIA

The Kafue River is the largest tributary to the Zambezi River (Figure 1)<sup>1</sup>, contributing 9 per cent of the flow<sup>2,3</sup>. The abundance of water in the Kafue has allowed significant development of different sectors of the economy. Due to the increasing growth of different sectors, competition for water resources will expand.

The Kafue is the economic hub of Zambia. The Upper Kafue Sub-Basin is home to the Copperbelt mining region. The Lower Kafue Sub-Basin is the source of 50 per cent of all hydropower produced in the country, home to 7 per cent of the national fisheries, 20 per cent of the national cattle herd, and supplies 44 per cent of Lusaka's water. It is also an important tourism region, a Ramsar wetland of international importance and home to significant wildlife diversity.

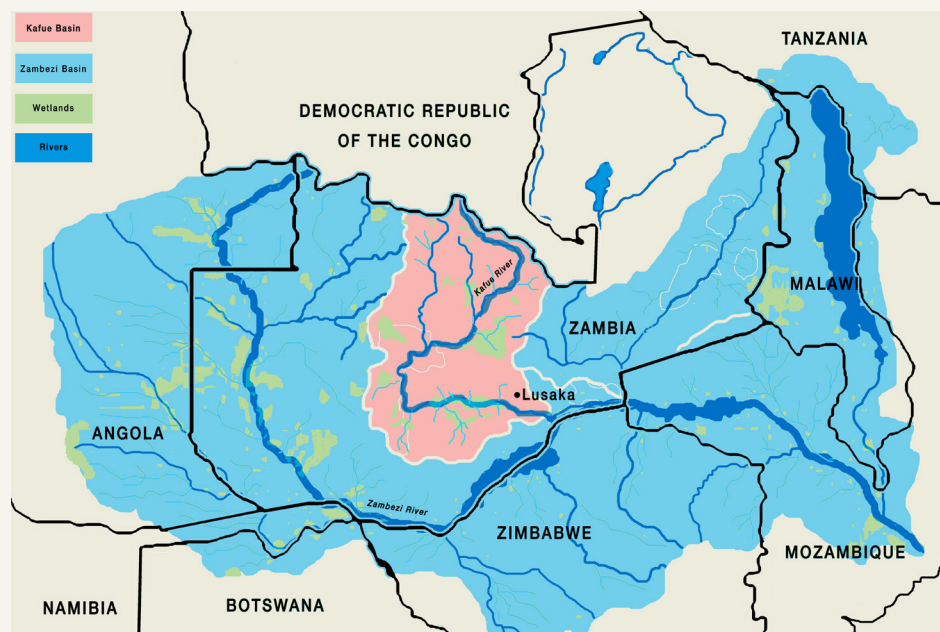


Figure 1. The Kafue and Zambezi river basins

1 <http://www.grida.no/publications/zambezi/ebook.aspx>

2 Figure source: [http://webworld.unesco.org/water/wwap/wwdr/wwdr3/case\\_studies/pdf/Zambia\\_National\\_Water\\_Resources\\_Report.pdf](http://webworld.unesco.org/water/wwap/wwdr/wwdr3/case_studies/pdf/Zambia_National_Water_Resources_Report.pdf)

3 [http://siteresources.worldbank.org/INTAFRICA/Resources/Zambezi\\_MSIOA\\_-\\_Vol\\_3\\_-\\_State\\_of\\_the\\_Basin.pdf](http://siteresources.worldbank.org/INTAFRICA/Resources/Zambezi_MSIOA_-_Vol_3_-_State_of_the_Basin.pdf)

# THE PRIVATE SECTOR & WATER IN THE ECONOMY

As a business in Zambia, you are directly or indirectly dependent on the Lower Kafue. Whether using electricity generated at the Kafue Gorge Dam or water in Lusaka sourced from the Kafue River, your operations or supply chain rely on adequate water quality and quantity. Therefore, sustainable management of water resources in the Kafue basin is your business.

Demands for water in Lusaka, irrigation and hydropower generation are projected to grow, triggering an increase in water consumption and a possible reduction in water quality if not managed adequately. Meeting this increase in demand will depend on the ecological functioning of the Lower Kafue River, which in turn depends on the operating rules of Itezhi-Tezhi Dam for hydropower generation.

As each sector is poised to grow, now is an opportune time to ensure management decisions consider the trade-offs that need to be made across sectors.

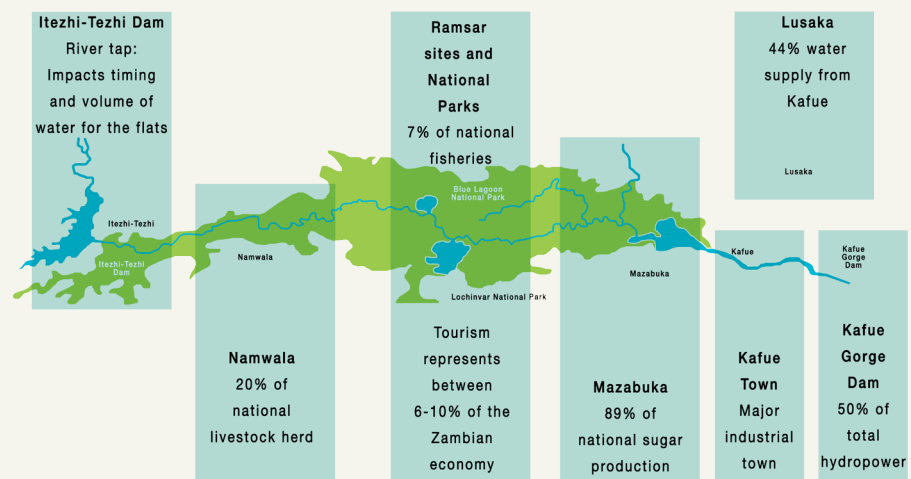


Figure 2. Specific zones of interest in the Lower Kafue Sub-Basin

*“Sustainable management of water resources in the Kafue basin is your business”*

Hydropower represents 90 per cent of all electricity produced in Zambia. The stability of water supply to drive the turbines is of paramount importance to the country. The Kafue Gorge Dam, situated downstream of the Kafue Flats, produces 50 per cent of the country’s electricity. There is further hydropower potential at Itezhi-Tezhi and the Lower Kafue Gorge. ZESCO (Zambia Electricity Supply Corporation) holds the largest water right in the Kafue River for abstraction to generate hydropower, although a large amount of water is not consumptive, and is available for other users downstream once released.

The electrification rate in Zambia is 22 per cent, while current growth in demand equates to 4 per cent a year<sup>4</sup>. Current electricity supply does not meet demand. In lieu of electricity, biomass sources are used for cooking and light; the majority of energy used in Zambia comes from wood or charcoal. This dependence on

<sup>4</sup> [http://www.ruralelec.org/fileadmin/DATA/Documents/06\\_Publications/Market\\_intelligence/AEEP\\_Zambia\\_Power\\_Sector\\_Market\\_Brief\\_EN.pdf](http://www.ruralelec.org/fileadmin/DATA/Documents/06_Publications/Market_intelligence/AEEP_Zambia_Power_Sector_Market_Brief_EN.pdf)

## THE KAFUE GORGE DAM PROVIDES 50% OF ZAMBIA'S ELECTRICITY

biomass has detrimental effects on the environment in Zambia. One side effect of deforestation is increased siltation of the river, which will in-turn negatively affect hydropower generation. Therefore, increasing access to electricity in addition to increasing generation capacity is necessary. Other alternatives include expanding the energy supply mix to include solar or biogas, or off-grid options in rural areas.

Hydropower is a core strategy for Zambia to drive energy-intensive development for the future. The mines are the major consumers of electricity, accounting for 68 per cent, followed by households, which use 19 per cent. The remaining electricity consumption is represented by agriculture and forestry (2 per cent), government and services (7 per cent) and commerce and industry (4 per cent). Mining represents approximately 80 per cent of all export earnings, and is therefore a critical sector to grow and develop for Zambia.

The embedded water of hydropower links the mines to the Lower Kafue. As a result, mines too have a vested interest in ensuring optimal water resources management of the sub-basin<sup>5</sup>. Assured availability of electricity is a key investment attraction for many industrial sectors in Zambia. Whether managed well or managed poorly, the Lower Kafue plays a fundamental role in influencing future investment options. Large, energy-intensive industries without individual power options would be wise to invest in sustainable water management to ensure hydropower production as part of their supply chain.

## LUSAKA'S LIFELINE

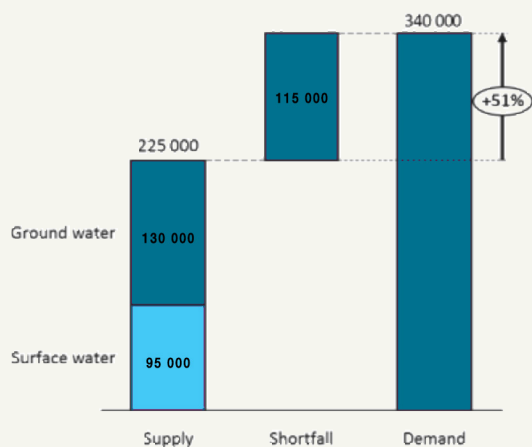


Figure 3. Demand for water in Lusaka outstrips supply

Lusaka is the capital and largest city of Zambia, as well as its chief administrative, financial, and commercial centre. It is a sprawling city located in a productive farming area with a population of over 1.7 million (13 per cent of total population) in 2010. It is considered one of the fastest growing (in terms of population) cities in Africa. Its population nearly tripled in the immediate post-independence era<sup>6</sup>. The population of the broader province of Lusaka is 2.2 million.

Situated within the Kafue Basin, the city is dependent on an offtake pipe from the Lower Kafue River for 46 per cent of its water supply. Almost 50 per cent of water pumped is lost as non-revenue water through leaks along the extensive pipeline<sup>7</sup>. Current demand for water outstrips supply, while projections indicate demand will continue to grow in response to growing demographics and investments. As groundwater resources continue to become polluted by industries, inadequate domestic wastewater treatment and aquifer over-abstraction, water will become increasingly stressed. The growing water demand will put further pressure on surface water abstraction from the Lower Kafue.

Lusaka needs to play a major role in promoting protection and collective management in the Lower Kafue. Without action from a range of partners, the quality and quantity of water sourced from the sub-basin will continue to decline. This has major consequences for domestic and industrial sectors alike.

<sup>5</sup> Central Statistics Office: Environment Statistics in Zambia – Energy, 2007

<sup>6</sup> <http://www.newworldencyclopedia.org/entry/Lusaka>

<sup>7</sup> <http://www.lwsc.com.zm/wp-content/uploads/2014/02/LWSC-AT-GLANCE.pdf>

Lusaka is dependent on the Kafue Hydropower Dam for the majority of its electricity. Increased energy demand and expansion of the network may result in load shedding if generation capacity is not increased. Without secure and adequate access to electricity, functioning businesses and industries have additional challenges to face.

Food grown in the Kafue is largely consumed in Lusaka. As the population continues to grow in Lusaka, so too will the demand for food. The trade-offs between water, energy and food directly impact Lusaka.

Companies operating within Lusaka are urged to consider the inputs required for business. This includes dependence on electricity from hydropower and food from the Lower Kafue and surrounds.

## THE SWEET SPOT FOR SUGAR

Agriculture represents 73 per cent of total water withdrawals in Zambia and 20 per cent of GDP (2013)<sup>8</sup>. Sugar alone contributes 3-4 per cent of GDP. Sixty-four per cent of water withdrawals take place within the Lower Kafue, where large tracts of sugarcane are irrigated<sup>9</sup>. Ninety per cent of all sugar grown in Zambia comes from the Mazabuka area. Zambia is one of the world's lowest cost producers of sugar due to water, labour, energy and infrastructure costs.

In Zambia, the sugar sector is dominated by Zambia Sugar<sup>10</sup>, which represents 91 per cent of total sugar production. Zambia Sugar is owned by Illovo, which is in turn owned by Associated British Foods. Zambia Sugar runs considerable business risk if it cannot increase production capacity. Without opportunities for growth, the sector is likely to stagnate, affecting employment, GDP and exports.

Large beverage companies, such as Coca-Cola, that are dependent on Zambia Sugar for their supply chains in Zambia should consider the risks and opportunities that exist in the catchment for optimising efficiency and ensuring their long-term business strategies. Companies may begin with first understanding their risks through data collection, move toward certification of efficiency gains, followed by collective action with other actors in the basin in order to manage more systemic risks.

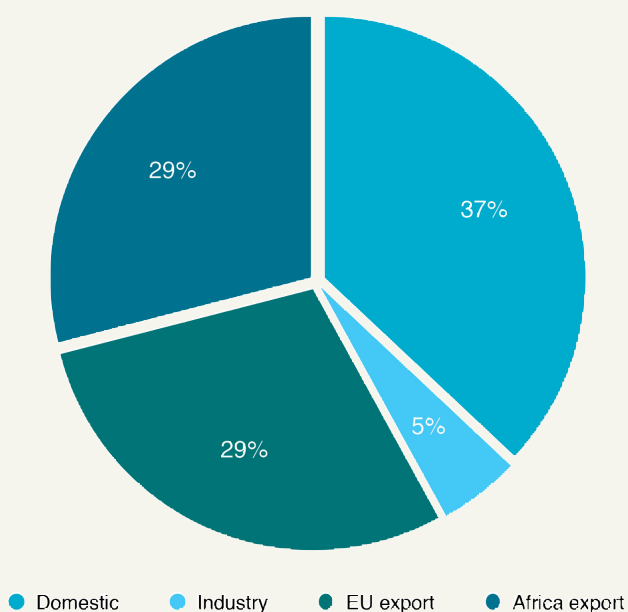


Figure 4. Zambia Sugar consumption and exports

## CATTLE COUNTRY

The beef and dairy industry together contribute 1 per cent of Zambia's GDP. In 2008, Zambia produced 58,400 tonnes of beef (US\$194 million) and 6,500 tonnes of raw milk (US\$39 million). Both beef and milk consumption per capita are lower than the averages of neighbouring countries<sup>11</sup>.

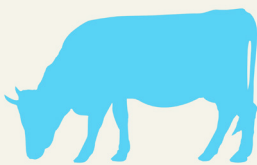
<sup>8</sup> <https://www.gfmag.com/global-data/country-data/zambia-gdp-country-repor>

<sup>9</sup> GIZ Water Abstraction Study, 2013.

<sup>10</sup> [http://personal.lse.ac.uk/sutton/sutton\\_zambia\\_press.pdf](http://personal.lse.ac.uk/sutton/sutton_zambia_press.pdf)

<sup>11</sup> [http://siteresources.worldbank.org/INTZAMBIA/Resources/beef-and-dairy-summary-notes\(online-copy\).pdf](http://siteresources.worldbank.org/INTZAMBIA/Resources/beef-and-dairy-summary-notes(online-copy).pdf)

**20%**  
**OF THE**  
**NATIONAL**  
**HERD**



Therefore there is potential to grow this industry to meet both domestic and export demand.

The Kafue Flats is home to the largest concentration of cattle in Zambia. The majority of cattle in the Lower Kafue are traditional breeds that are not specifically bred for meat or milk. The livestock are important in supporting local livelihoods and are a cultural status symbol, and therefore a fundamental part of the local community. Current growth in the cattle industry is through diversification with exotic livestock founded on the traditional livestock rearing methods.

Dependence on the Kafue hydrology is significant, as cattle are grazed during the dry season. The Itzhi-Tezhi Dam operating rules are critical in ensuring both high and low flows are experienced, which allows grazing areas to regenerate. Livestock then return to the previously flooded areas to graze. Therefore, like wild species, cattle also benefit from flow dynamics and improved planning within the Kafue Flats.

Companies such as Parmalat (owned by Lactalis) are increasingly investing in the Lower Kafue to improve dairy productivity in the region. Milk Collection Centres (MCCs) and fertilization programmes to increase milk production are some of the strategies being implemented. Many of these initiatives will improve local livelihood resilience to climate change. Zambia is a net importer of milk, and therefore there are significant opportunities for growth in this sector.

Zambeef, together with its subsidiary companies, is one of the largest integrated agri-businesses in Zambia. With a listing on the London Stock Exchange (AIM), the company is compliant with both national Lusaka Stock Exchange and international regulations. It is one of the largest suppliers of beef in Zambia, with a capacity to slaughter 100,000 cattle per scale farmers. This plays an important role in supporting livelihoods within the Lower Kafue.

Companies and supply chains that depend on beef and dairy in Zambia face both risks and opportunities. They have an opportunity to grow in order to meet demand, however also face significant risks due to the changing hydrology of the Lower Kafue. The important social benefits associated with these industries need to be supported. This is best done through collective action undertaken by companies, NGOs and government together.

## **KAFUE FLATS: HOME TO ENDEMIC KAFUE LECHWE AND WATTLED CRANE**

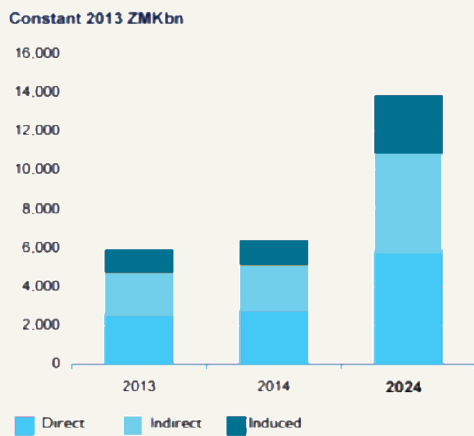
The Blue Lagoon and Lochnivar national parks based within the sub-basin are a strategic touristic attraction due to their proximity to Lusaka and Kafue National Park. The Lochinvar and Blue Lagoon national parks are home to the endemic Kafue lechwe, and congregations of key bird species such as the wattled and grey crowned crane. The two national parks have been mentioned, alongside Greater Livingstone and the Northern Region, in the sixth National Development Plan as key focal areas, and Zambia Wildlife Authority are in the process of setting up an eco-lodge to increase tourism potential in the Lochinvar National Park.

Competitive labour costs, low power tariffs and abundant water supply are noted as drivers of tourism investments in Zambia<sup>12</sup>. Tourism contributes 5.2 per

<sup>12</sup> <http://ab-network.jp/wp-content/uploads/2014/07/Tourism-Sector-Profile.pdf>

<http://www.wttc.org/-/media/files/reports/economic%20impact%20research/country%20reports/zambia2014.pdf>

#### ZAMBIA: TOTAL CONTRIBUTION OF TRAVEL & TOURISM TO GDP



<sup>1</sup> All values are in constant 2013 prices & exchange rates

Figure 5. Direct, indirect and induced tourism GDP earnings

cent of GDP and is forecast to double (Figure 3). Total employment through tourism currently represents 3.6 per cent of jobs in Zambia. This is projected to grow to 4.5 per cent by 2024.

The tourism potential in the Lower Kafue is fundamentally dependent on the flow regime controlled through the current and future operating rules followed by ZESCO at Itezhi-Tezhi Dam. Mimicking the variable hydrology with both high and low flows is important for biodiversity and ecosystem function.

Tourism has significant potential that has not yet been realized. Tourism operators and related industries in the Lower Kafue are well positioned to leverage their possible economic and employment contributions to the region and ensure conservation of biodiversity. It is clear that tourism initiatives need support from other stakeholders within the basin.

## THE NEED FOR COLLECTIVE ACTION AND WATER STEWARDSHIP

“Water risks cannot be managed by a single institution alone, and require collective action from a range of actors.”

Companies globally are beginning to recognize that water risks are real and require actions not only within internal value chains, but also at production sites or at basin scale. They are increasingly contributing to responsible, sustainable management of freshwater resources by looking outside of individual water use statistics and considering the broader system of the catchment. A framework has been developed by WWF to outline the steps toward collective action and better water stewardship.

There are two elements of critical importance in the Lower Kafue Sub-Basin: the timing of flows managed through Itezhi-Tezhi Dam and the allocation of water resources to major sectors. The associated water risks and opportunities cannot be managed by a single institution alone; they require collective action. Activities may start as technical projects, such as on-site efficiency measures, but should evolve into collective action projects at basin level, bringing perspectives and activity from a range of stakeholders. The adjacent figure indicates the kind of activities that can comprise a water stewardship journey.

## A CALL TO ACTION AND NEXT STEPS

WWF together with key stakeholders that include civil society, private companies and government institutions have collectively come together in an effort to better understand the risks facing the Lower Kafue Sub-Basin.

The group understands that the challenges and opportunities that exist within the basin cannot be harnessed alone. Throughout this brief, selected strategies have been suggested for the private sector as key action points. These are in addition to the action steps highlighted alongside the adjacent WWF water stewardship steps.

# WWF STEWARDSHIP STEPS

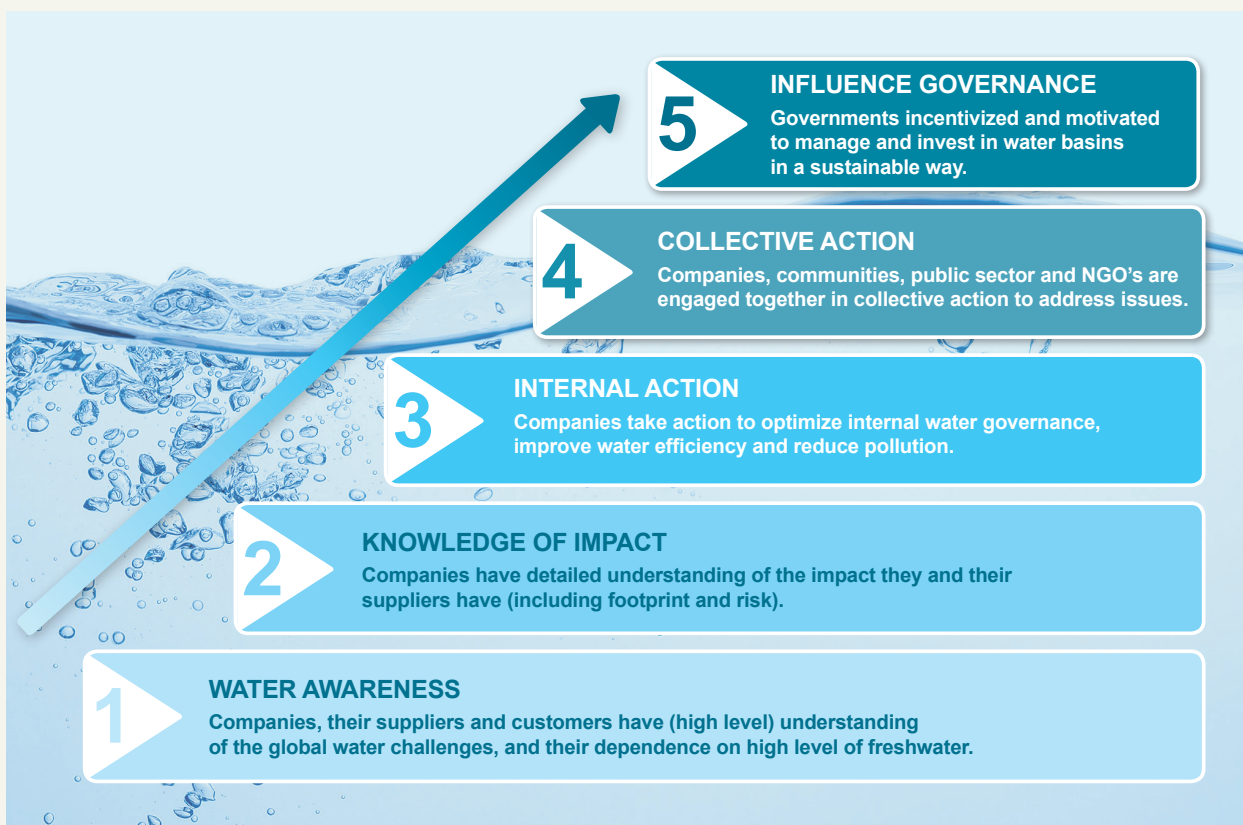


Figure 6. WWF Water Stewardship Steps ©Odellus & Co/In A Box AB

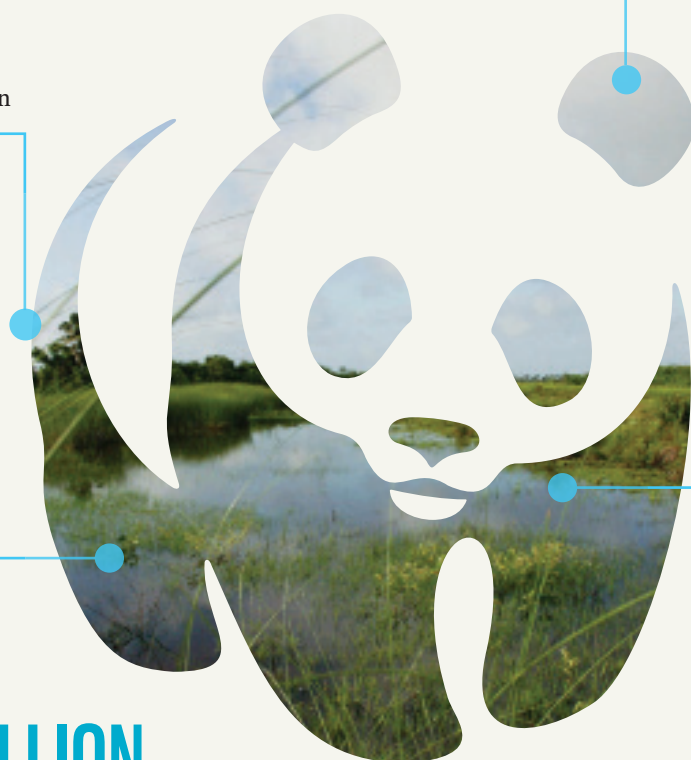
# Kafue Flats in numbers

44%

The Kafue River supplies 44% of Lusaka's domestic and industrial water

50%

The Kafue Gorge dam accounts for 50% of total hydropower production in Zambia



1 MILLION

Almost 1 million people depend directly on the Kafue Flats for their livelihoods

1 CLICK

The WWF Water Risk Filter can be accessed at: <http://waterriskfilter.panda.org>



**Why we are here**

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

**For more information, contact:**

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