



## Ignoring another inconvenient truth? Challenges in managing Africa's water crisis

**"Among the many things I learnt as a president was the centrality of water in the social, political and economic affairs of the country, the continent and the world."**

(Nelson Mandela)

Water is a basic need and an important catalyst for accelerating socio-economic development in semi-arid areas. Good management of water resources is a pre-requisite for rural development. During the First African Water Week, held in Tunis in March 2008, the African Development Bank, the New Partnership for Africa's Development (NEPAD) and the World Bank called for an increase in funding and a renewed focus on agricultural water management in Africa, including irrigation, drainage and rainwater harvesting. Growth in the agricultural sector is considered vital to poverty reduction and achieving the Millennium Development Goals (MDGs) by 2015. The Initiative called for knowledge sharing to improve and expand the availability of water. By adopting the MDGs, the world pledged to halve the number of people without access to safe drinking water by 2015. With the exception of Sub-Saharan Africa, the world is reportedly well on its way to meeting this target.

*With only 64% of the population having access to improved water supplies, Africa has the lowest proportional coverage of any region of the world. The situation is much worse in the rural areas where coverage is only 50%, compared to 86% in urban areas. By 2025, at least 48 countries are expected to be facing water shortages. No fewer than 22 of these are in Sub-Saharan Africa, which means that approximately 2.8 billion people (35% of the projected world population) will be living either in water-scarce areas (less than 1,000 cubic metres/cap/yr) or in water-stressed areas (between 1,000-1,700 cm/cap/yr).*

It is recognized that the achievement of each of the MDGs hinges on the availability of safe water. However one person in six – more than 1 billion people – still has little choice but to use potentially dangerous sources of water. And beyond the focus of public attention, an unseen

emergency is continuing to unfold due to competition over access to water. There is a water crisis and, more than anywhere else, Africa is facing a growing scarcity of water. Access to clean water (and sanitation) has been earmarked as the most crucial resource for life and a vital productive asset in agriculture and industry. At the same time, water is thought to be a potential trigger for future wars (some claim it already is) as well as a reason for countries and groups to come together and prevent conflicts.

**"Of all the social and natural crises we humans face, the water crisis is the one that lies at the heart of our survival and that of our planet Earth."**

(UNESCO Director-General Koichiro Matsuura)

This ASC Info sheet addresses the call for knowledge sharing by providing the results of some twenty-five years of experience in providing water in semi-arid Kenya.



Kajiado District, Kenya

(Since 2007 split into Kajiado and Loitokitok districts)

### *Integrating indigenous and modern technologies for sustainable development*

In the late 1980s the Dutch government supported water provision as part of a larger integrated rural development programme in Kajiado District in southern Kenya entitled Arid and Semi-Arid Lands (ASAL). The aim was to assist local people in accessing sustained safe water supplies that would support social and economic development. The approach was bottom-up, with attention devoted to shallow wells, indigenous water sources that people had developed over the years. A shallow well is a hole that has been dug, bored, driven or drilled into sand or rock to allow the extraction of water from shallow aquifers. The geological characteristics, depths, diameters and shapes influence the volume and quality of the water. Some shallow wells, for example, have a depth of up to 30 meters.



*A traditional shallow well*

For too long, the donor community only valued modern, large-scale and expensive techniques. As a result, water production technologies in most of Africa's rural settings were - and to an extent still are - imported, and many are inappropriate. For example, a district-wide fact-finding survey in 1988 revealed that many boreholes in Kajiado were not working. Of the 387 boreholes drilled between 1927 and 1988, only 139 (36%) were still operational.

By contrast, the 1,505 traditional shallow wells dug by the local people were still providing water and were proving to be a reliable and cheap source of water for both people and livestock alike. Even the oldest, dug in 1920, was still in operation.

The survey, however, revealed that the wells were experiencing problems that demanded improvements. Silting emerged as one of the main issues, especially during the rainy season, while sand storms caused wells to fill with sand. A lot of time and money is needed each season for repairs. A second problem was the potential

collapse of the sand walls. And a third concern was pollution as the wells are not covered and all kinds of vermin, chemicals used to cure livestock diseases, and animal urine and faeces collect in them, especially when it rains. The local people also wash themselves and their clothes near the wells. Collaboration between ASAL officials and well owners resulted in an improved well design that promised to be sustainable from a financial, technical as well as management point of view. The improvements included placing a filter, enforcing and lining the walls, covering the well and installing a hand pump. The cost of these wells was about 10% of what it would cost to drill a borehole. The passive adoption of Western techniques was stopped and exchanged for one that builds on the local people's resources, means and ideas. From being in a position of supplying and donating resources, the donor moved to one of translator and facilitator. It was, above all, a happy marriage between indigenous and modern water knowledge.



*An improved shallow well*

This new approach has overcome many past failings in the water sector, such as improper or misplaced technological improvements, unclear ownership and poor management. Throughout the 1990s all the water points operated smoothly, the wells being effectively managed, and their numbers mushrooming, providing water for livestock, cultivation and human consumption. Food security, in particular, was boosted by the rapid spread of small-scale cultivation.

Recently, the Kenyan ASAL water engineer responsible for this innovation revisited the improved wells to monitor their current state.

**"In Africa we have hundreds of millions of poor people in rural areas for whom there is no alternative. For these people, agriculture will have to be the key to their development, for their escape out of poverty, and water is a crucial constraint in many places."**

(Salim Ahmed Salim, African Water Ambassador)

### *Findings from the 2007-2008 visit*

The revisit showed that the development of improved shallow wells, which began in the 1990s, had continued. Two aspects, however, were earmarked as still wanting. First, the development of new wells was more problematic after the ASAL programme stopped operations. Financial support and technical advice were less easily available. What was more important though was the threat posed to already existing improved wells by a number of new developments that had occurred in the area. New large-scale settlements and commercial agricultural activities have resulted in the sinking of many deep boreholes that are draining the aquifers and reducing the quality of the water. While these new intrusions differ in type and magnitude, they are all working to the detriment of groundwater sustenance. The worst effect to date has been the drying up of a large number of the (improved) shallow wells near these new activities, forcing the owners – the majority of whom are relatively poor – to buy water from their new commercial neighbours.



*An improved shallow well being re-dug*

In total, there are 105 deep boreholes supporting different endeavours in the Olkinos and Embolioi study area. Since communal land was subdivided in the mid-1980s, it has become a commodity that allows new landowners to settle there. Horticulture and poultry farming are becoming important, with these two enterprises owning 32 deep boreholes that, due to over-

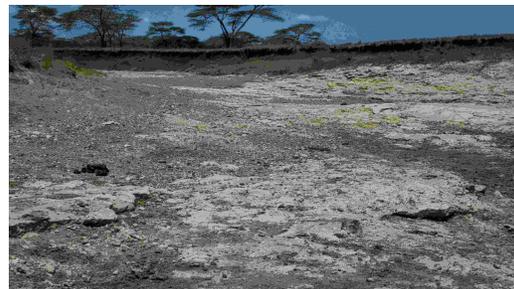
abstraction, have led to the drying up of 29 shallow wells. Most of the boreholes are within the prohibited distance of 800 m from any other source of groundwater. Lack of control and monitoring by the authorities is responsible for this breach of the Water Act. The area's flower farms are also being blamed for polluting water courses and for livestock disease and deaths. Environmental policies are ineffective in prohibiting the destructive exploitation of natural re-



*A flower farm*

sources. The recent introduction of eucalyptus-tree farming (for electricity poles, construction and firewood) has been motivated by its potential as a good earner, and its fast expansion is likely to reduce water tables further. The Olkinos/Embolioi area accounts for 14 eucalyptus farms and these have contributed to the drying up of 3 shallow wells in a radius of 0.1 and 1 km within two years of the trees being planted.

Another threat comes from sand and vegetation harvesting in the seasonal rivers of Kajiado. Some riverbeds are now bare rock, with the shallow wells in and along these seasonal waterways being lost as a result of unabated sand harvesting. The sand, which holds and protects the water for the shallow wells and aquifer recharge, is being exported outside the district to the construction industry in Nairobi and beyond. The river banks have become bare of trees due to charcoal burning and higher levels of water evaporation. The threat is not only to



*Bare-rock dry river beds*

people and their economic activities but also to wildlife and the ecosystem in general.

Finally, with the growth of Nairobi, more people are moving into Kajiado District. Kitengela town and its surroundings have grown tenfold in the last ten years due to immigration. As more settlement takes place, wells are being drilled to meet the rising demand for water. These new challenges are undermining the improved water wells and present an inconvenient truth for all stakeholders. How can this best be addressed?



Sand for sale

### Failing legislation

Kenya is increasingly witnessing violent conflicts over water resources. In Kajiado, verbal and written complaints from owners of shallow wells affected by the drilling of deep boreholes have so far not been heeded. It cannot be ruled out that disillusioned individuals and communities may in the future take the law into their own hands to 'solve' the problem.

Through the Water Act, the Ministry of Water and Irrigation is entrusted with regulating water access and use. This, however, presupposes that the Ministry's field officers have the resources and know-how to assess water use and local demands and enforce regulations. Resource constraints within the public sector limit the effectiveness of such mechanisms. The Act does, however, provide limited regulation of extraction but is unable to address broader environmental issues that could impinge upon issues of water quality or overexploitation. On the other hand, the land policy, which has considerable bearing on the provision of water, is yet to be decided.

Besides maintaining and strengthening existing laws, commercial farmers should be held responsible for the unsustainable groundwater abstraction practices that are threatening the environment. These short-term exploitative practices may ultimately destroy the employment opportunities and economic wealth that has been created.

**“Failure to address the water problem will result in food scarcity. Water scarcity is no longer an environmental issue. It is a national and international security issue that cannot be ignored.”**

(Peter Brabeck-Letmathe, Nestlé)

ASC research on land and water issues has raised awareness of the need to ensure the sustainability of water use at local and international levels. Interaction with the local people in this research project has made it possible for them to appreciate the Water Policy and Water Act, the requirements of national environmental management and the dynamics of the interventions that stand in the way of sustaining their water resources. The most tangible impact of revisiting the shallow wells has been the consensus built on the need to evaluate their condition and use in order to produce more data and establish a better understanding of the effects of competing groundwater extraction. A second result has been the realization of the need for a clearly illustrated manual addressing the construction and maintenance of improved shallow wells to ensure the provision of safe water for the inhabitants of Kajiado District and other arid and semi-arid lands.

### Kajiado Shallow Wells Development Project (KASHWEP), some relevant publications:

Mwangi, M.N. (1993), *MPhil Research Report on shallow wells in Kajiado District, Kenya*, Unpublished Annual Progress Report, WEDC, Loughborough University, UK.

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Mwangi, M. & M. Rutten, (2007/2008) Shallow wells development field research reports, November 2007 – ongoing.

Rutten, M. (2005), *Shallow wells: A sustainable and inexpensive alternative to boreholes in Kenya*, ASC Working Paper 66.

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