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water

research findings for development policymakers and practitioners

Providing water for African livestock

Animal production is one of the largest uses of agricultural water in the world. In many parts of Africa, livestock demands conflict with water for crops. Managing these competing demands is vital to protect this increasingly scarce resource and to minimise environmental damage.

Livestock use a great deal of water, both for drinking and producing feed. Despite this, livestock water is often ignored in water use management and planning.

Research in several African countries by Bartridge Partners summarises the challenges of providing water for livestock. The researcher suggests that projects to provide water for livestock should include objectives for efficient production and environmental sustainability. This would require learning from past failures in livestock water projects.

Population increases have forced people to grow crops in areas previously used by pastoralists. Increased competition between crops and livestock has often led to human conflict

Water sources vary across Africa. Some are shared between animals and people, while others are exclusive to animals. Some are permanent, others seasonal. Each different system has different challenges for sustainable water management, but there are several common issues, such as disease risk and soil erosion.

Methods for watering livestock also vary. For example, the distance of water from grazing land is particularly important in dry areas. This determines the amount of time, energy and body water that livestock use whilst travelling to water. Water sources need to be reliable in times of shortage. The method of extracting water from the ground is also critical; this determines how much human work is needed before the animals get to drink, and can perhaps help to control the stocking rate.

The research shows:

- Population increases have forced people to grow crops in areas previously used by pastoralists. Increased competition between crops and livestock is particularly acute where irrigated agriculture has been introduced into grazing areas. This has often led to resource conflict, and also to human conflict.
- In areas with higher rainfall and abundant water sources, secure land tenure has been shown to increase the efficiency of water use.
- In lower rainfall areas, providing new water sources has often led to environmental degradation and social conflict.
- Few African governments have experience, expertise or interest in livestock production. This means that where crops and livestock compete, policies are often biased against pastoralists.

Water for livestock is only one part of rural livelihood systems. Policies for livestock water need to consider other uses as well, including crops and forestry. They also need to consider the broader issues of human and animal health, education and social security.

The researcher recommends:

- In high density mixed farming areas, water facilities for livestock should be incorporated with those for people. This would result in small improvements to existing water supplies.
- In lower density pastoralist areas, the development of water sources should be limited in time and space to ensure that water supply does not exceed fodder supply. Environmental impact assessments should always be undertaken.

A goat herder in Somali Region, Ethiopia, fills a vessel with water from an open well to give to his goats. Much of the landscape has become desertified in the drought.
© Dieter Telemans/Panos Pictures

- In both cases, the cost of developing water supplies should be recovered from water users.

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'Perceptions, Practices, Principles and Policies in the Provision of Livestock Water in Africa', *Agricultural Water Management* 90, pages 1-12, by R. Trevor Wilson, 2007

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Reducing the cost of groundwater drilling in Ethiopia

In sub-Saharan Africa, 290 million people lack access to safe water supplies. One reason is the high cost of drilling and borehole construction. Even small savings could extend coverage to millions of people.

Research from the Water and Sanitation Program, based in Kenya, and the Rural Water Supply Network Secretariat in Switzerland, examines groundwater drilling costs in Ethiopia and sets out some ways they could be reduced.

The main reasons for high drilling costs in Ethiopia include:

- inappropriate borehole designs raise costs, for example, drilling deeper than necessary
- drilling works tenders are often not cost-effective – they may involve few boreholes and long distances between sites
- a lack of knowledge and information about the country's groundwater resources
- a lack of training in important areas, including drilling, groundwater investigation and construction supervision
- boreholes which do not work, for example due to poor construction or inaccurate assessment of groundwater resources
- the costs of 'doing business' discourage private sector participation. There are several barriers to private sector participation, such as import restrictions and the need to obtain a government licence to operate as a drilling contractor.

To meet the Millennium Development Target 10, Ethiopia will need to provide 28 million more people with access to safe water, and will need an estimated 80,000 new boreholes by 2015. A cost saving of ten percent per borehole could result in reaching an extra two million people for the same investment.

Groundwater drilling costs in India are typically less than one tenth those in sub-Saharan Africa. Since the late 1970s, India has reduced the number of people without access to a safe water supply from 450 million to 140 million. Several important differences make comparisons between the Indian and Ethiopian cases difficult. For instance, Ethiopia has an underdeveloped manufacturing sector and challenging drilling conditions.

However, the key success factors of India's water programme included: government commitment, continuous investment from external support agencies, private sector involvement, and strong technical and management skills.

Changes to the drilling sector in Ethiopia will require committed involvement and participation of the public and private sectors, civil society and donors:

- The private sector should be supported through measures such as easing import procedures, assuring steady, sufficient work flow and training.
- The public sector needs to be technically competent, and fair and efficient in the way tenders and contracts are put together and managed.
- Sustainable operation and management of boreholes is essential, including financing and community participation.
- Multi-stakeholder working groups should be set up to address problems in the drilling sector. These need to include the public sector, contractors, donors, manufacturers and suppliers, and non-governmental organisations.

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Ten-step Guide Towards Cost-effective Boreholes: Case Study of Drilling Costs in Ethiopia, Rural Water Supply Series Field Note, WSP and RWSN, by Richard Carter, 2006 (PDF)
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Providing clean water and sanitation

Millions of the world's most vulnerable people face a daily battle to get enough clean water. However, water scarcity is not caused by insufficient water: power and inequality influence who has access to this precious resource.

Today, 1.1 billion people in developing countries have inadequate access to water, and 2.6 billion people lack basic sanitation. This affects many aspects of human development. The 2006 Human Development Report by the United Nations Development Programme analyses water scarcity and suggests future actions to ensure water access for everyone.

Not everyone in developing countries experiences water scarcity. In high-income areas, people enjoy access to several hundred litres of water a day, delivered by public utilities at low prices. In low-income areas, however, many poor households have much less than the 20 litres of water that humans need every day. This inequality exists in many countries and can cause wider social problems and unrest. It also undermines everyone's basic human right to clean, safe water and sanitation.

Water insecurity affects many aspects of human development, particularly health. At any given time, nearly half of all people living in developing countries suffer from health problems caused by a lack of clean water or sanitation. The research shows:

- Unclean water and poor sanitation are the second biggest cause of child deaths in the world – 1.8 million children die each year because of diarrhoea.
- Water-related illnesses amongst children cause 443 million school days to be lost each year.
- Illness caused by poor quality water affects economic activity and causes a loss of productivity. The economies of countries in sub-Saharan Africa lose about US$28.4 billion annually due to water-related illness. This exceeds total aid flows and debt relief to the region.
- People need clean water and sanitation to maintain their personal dignity.
- Many women spend several hours every day collecting water, which reduces their time for other activities.
- Water sustains ecological systems and is vital for many livelihoods, for example as an input for agriculture. Insufficient water can reduce poor people's ability to earn an income.

An increased international effort is needed, which must include both national strategies and global action plans. These must have four basic conditions:

- The human right to water should be central to all national laws concerning water. This right must entitle everyone to a secure, accessible and affordable supply of water. A minimum of 20 litres of clean water a day for each citizen should be the target everywhere.
- All governments should prepare national plans for increasing progress in providing clean water and sanitation. These plans should include targets and funding plans. They should also include clear strategies for overcoming inequalities in access to water.
- International aid is needed to support national plans in developing countries. This financing requires coordination and monitoring through a global action plan.

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