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Integrating water resources and water demand to improve drought resilience and build water strategies

A pilot approach in Kenya's arid and semi-arid lands

Building resilience against drought in arid and semi-arid lands is the challenge addressed by the Kenya Arid Lands Disaster Risk Reduction – Water, Sanitation, and Hygiene (KALDRR-WASH), a two-year programme supported by USAID and The Netherlands. This note focuses on an innovative approach developed and tested in the programme: using local, participatory water planning to match water resources with water demand. The integrated planning then informs strategies for recharging, retaining and reusing (3R) shallow groundwater to create stronger water buffers for bridging droughts.

The challenge

In Kenya's arid and semi-arid lands (ASALs), the total demand for water often exceeds the water available to people and livestock. This problem is compounded by weak support from government and competition for resources amongst water users, which creates the potential for armed conflict. Most water-related interventions are short term and target a single problem, rather than the whole complex of problems that communities face. The benefits are therefore often short lived and dwarfed by the remaining problems.

Although Kenyans experience periods of severe water scarcity, annual rainfall is actually sufficient to support their livelihoods. The gap arises because a large portion of the water disappears unused through surface runoff, flooding and evaporation. A new approach is needed to unlock the potential of water sources, and use and manage them in a strategic and sustainable way.

Integrated approach to matching water supply and demand

The Dutch partners developed an innovative approach that integrates the management of local water resources and services. Using the RIDA framework (for resources, infrastructure, demand and access), it evaluates on one hand the potential of water resources and existing supply infrastructure, and on the other hand total water demand and water access challenges. This integrated, area-based approach encompasses all local water uses (domestic, livestock, agriculture), all local water resources and all local water stakeholders (operators, users, government).

RESULTS PROVIDE THE FOLLOWING BENEFITS:

- Guiding policy makers, funding organisations and coordinating entities in determining appropriate interventions to match local water supply with multiple demands.
- Helping implementing organisations consider options for water supply interventions when applying for funding.
- Supporting local stakeholders to identify and agree on innovative solutions for managing drought and securing livelihoods.

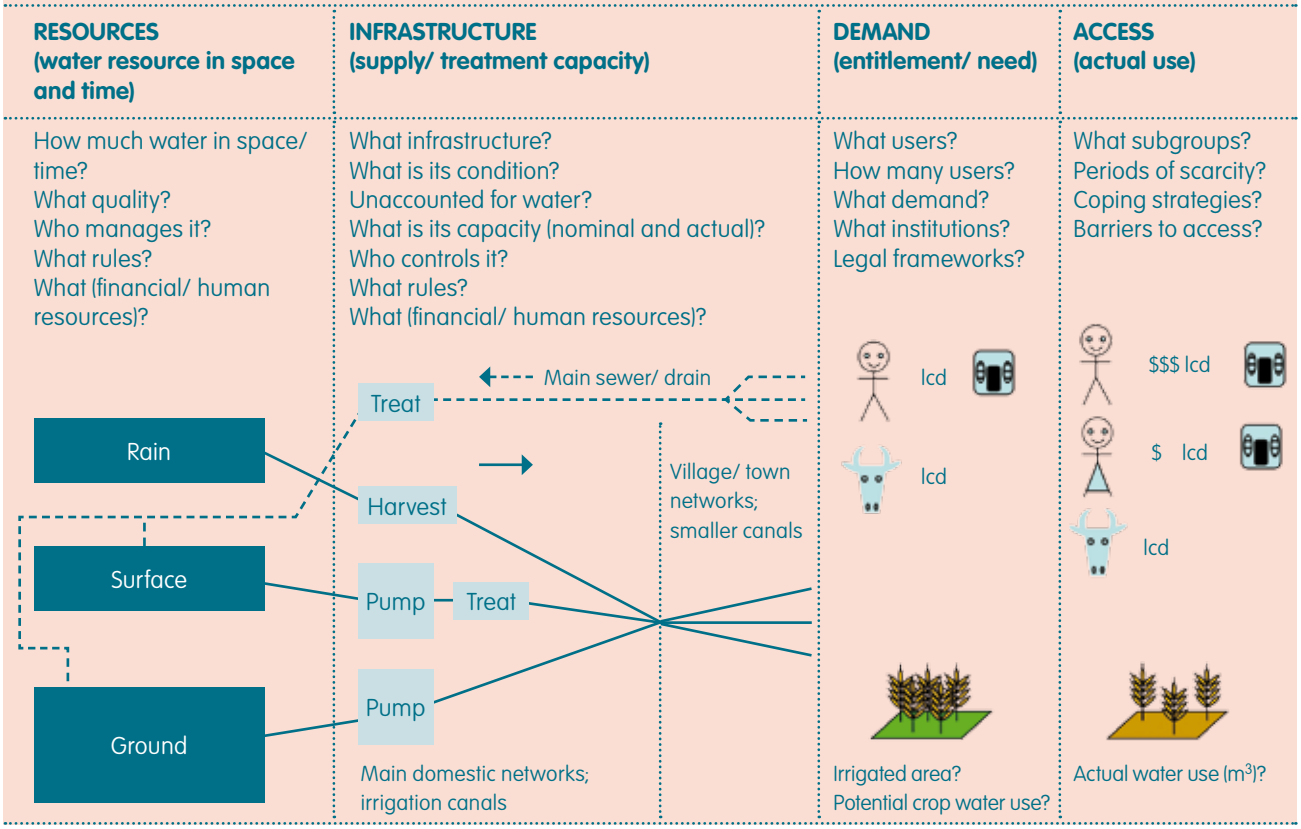
Sanddam, Kalemngorok, Turkana (by Reinier Visser, 2013)

Acacia Water

Aqua for all

in association with IRC

RIDA FRAMEWORK

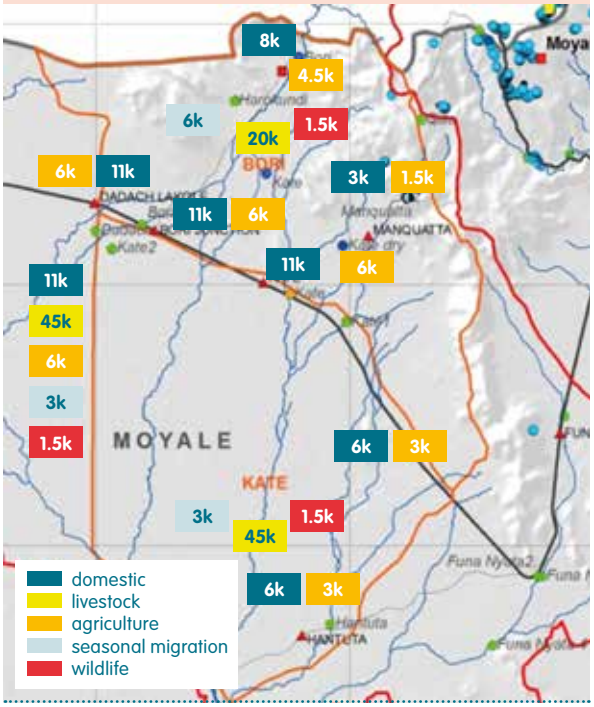


Source: Moriarty, et al., 2007.

Local stakeholders develop a water master plan that matches resources, infrastructure, demand and access for the long term. Based on field assessment and research, an estimate is made of the actual water gap for the coming ten years, for all water uses. Next, strategies are developed to meet these gaps through water infrastructure, water governance, water service management, and capacity development. Stakeholders divide responsibilities for coordinating the different strategies of the water master plan. Cost estimates for the strategies are based on the life-cycle costs approach analysis of water services. This contributes to a better understanding of the complete cost picture–including the costs of operation, maintenance, rehabilitation and eventual replacement–for each intervention, and promotes agreement on ways to finance these costs.

Stakeholders then select recharge, retention and reuse strategies to complement traditional water sources, such as boreholes, to increase the amount of useful water. 3R interventions extend the chain of uses and store water in shallow aquifers, the soil profile, open water and tanks. The ultimate goal is to create secure water buffers that can meet the local water demand. This translates into increased resilience during droughts, higher productivity and better access to drinking water. 3R interventions and techniques are already broadly used. Typical examples in ASALs are sand dams, sub-surface dams and water pans.

POTENTIAL FOR WATER BUFFERING: 3R APPROACH IN NORTHERN KENYA



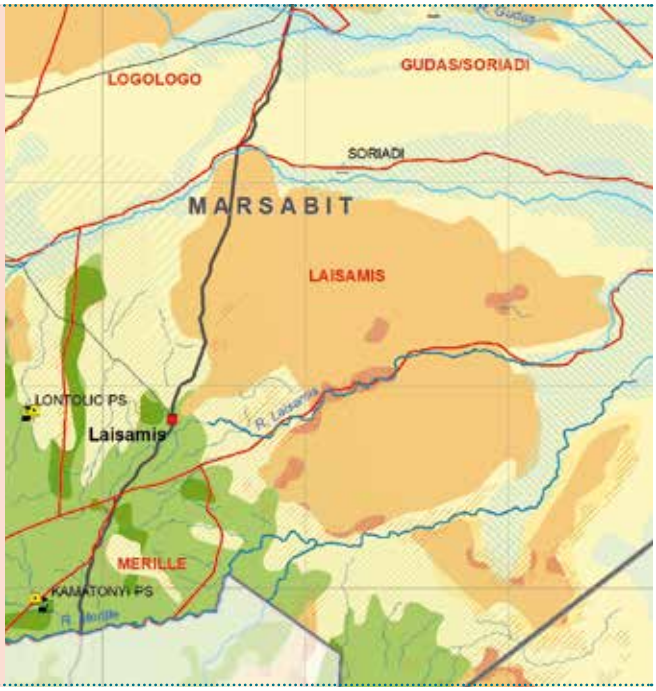
Source: IRC, forthcoming.

POTENTIAL FOR WATER BUFFERING: 3R APPROACH IN NORTHERN KENYA

The selection of 3R interventions in the programme area is based on the characteristics of the natural landscape. The 3R study assesses the potential to strengthen water resources through recharge, retention and reuse.

The assessment determines the techniques that can be used and the amount of water that can be stored. The potential for water buffering is visualised at a landscape scale through a zone map.

The methodology for selecting 3R interventions, developed and applied for the first time to Kenya's ASALs, is described in a separate publication by Acacia Water.



Detail of a 3R map: The colour zones indicate the kind of 3R intervention that may be possible in the area.

Source: Acacia Water, 2013.

Promising findings and initial successes from the pilots

- Only a relatively small amount of rainfall needs to be stored to meet demand in rural areas, even in the driest years.
- Local, participatory water master planning is a strong tool for guiding interventions and building resilience to drought.
- The methodology can be replicated and scaled up to other areas, to estimate what resources and infrastructure are needed to meet future demand.
- In Wajir, the participatory planning meeting addressed and defused conflicts over water and land. The mapping of the water gaps informed discussions on options for grazing land strategy in both wet and dry seasons. Participants agreed to create new water sources near homesteads to avoid conflicts with neighbouring clans with migrating herds.
- In Marsabit, county planners were very positive about using new tools and insights to set priorities.
- In Moyale, stakeholders said that the tools provided an excellent opportunity to integrate traditional water management practices, which are neglected in most other planning processes.
- In Marsabit, Wajir and Turkana, government representatives recognised the link with Kenyan planning mechanisms, and said the new tools would help them translate county plans into actions.

RESULTS OF THE INTEGRATED APPROACH IN MOYALE

The Kate area west of Moyale has a high water demand, but the existing water sources have low functionality. Tapping new water sources in grazing lands is likely to increase conflicts over water and pasture. The village needs water sources for domestic use that would not attract more livestock operations. The survey showed that sand dams in the nearby mountains could increase the recharge of existing wells that are used during droughts. This type of intervention will improve the resilience of the local community, without inducing conflicts and land degradation.

WHAT STAKEHOLDERS SAY ABOUT THE APPROACH?

- It makes information available in a country where access to data is difficult, thus providing a good basis for decisions.
- It uses participatory approaches that give people ownership over decisions.
- It integrates sub-sectors, such as water resource management, domestic water, agriculture, livestock, industrial development and wildlife.
- It fits into country policy and strategy frameworks, such as the water management planning guidelines.
- It addresses the needs of communities.
- It includes maps, which are easily made using basic technology, to facilitate the discussions.

Future directions

The pilot was based on proven approaches developed in different contexts but tailored to ASALs in Kenya. The next task is to refine the methodology so that it will be replicable and can be scaled up. Steps include the following:

- Linking the methodology to the government's existing water management planning approach and institutions.
- Improving interpretation and applicability of the maps (e.g., for irrigation or specific conservation techniques).
- Streamlining participatory processes for small sub-catchments, catchments and/ or county administrative levels.
- Improving planning with information on the financial sustainability of water interventions.

Although the methodology used in the KALDRR-WASH pilots needs to mature and be refined, initial experience shows that it helps local communities, leaders and government staff discuss and develop innovative solutions to water-related livelihood challenges in drought-prone areas. The short time span of the project means that implementation of the local water master plans and the 3R interventions are only just starting; the longer-term benefits are not yet apparent.

The Dutch and Kenyan partners will continue to develop, test and expand the approach, methodology and tools in collaboration with ASAL stakeholders.

Community meeting in Eyrib, Wajir (by Margaret Ombai, 2013).

References

Acacia Water, 2013. *Potential for water buffering: a landscape based approach.* Gouda: Acacia Water.

IRC, forthcoming. *Water master plans for Turkana, Marsabit, Moyale, Wajir.* The Hague: IRC.

Moriarty, P., Batchelor, C., Abd-Alhadi, F., Laban, P. and Fahmy, H., 2007. *The EMPOWERS approach to water governance: guidelines, methods and tools.* Jordan: INWRDAM – Inter-Islamic Network on Water Resources Development and Management on behalf of the EMPOWERS partnership.

For more information

Read: Adank, van Koppen and Smits, 2012. *Guidelines for planning and providing multiple-use water services.* The Hague: IRC on behalf of the MUS group.

Read: Tuinhoff, A., van Steenbergen, F., Vos, P. and Tolk, L., 2012. *Profit from storage: the costs and benefits of water buffering.* Wageningen: 3R Water Secretariat.

On KALDRR-WASH, visit: www.ircwash.org – On 3R, visit: www.bebuffered.com – On life-cycle costs approach, visit: www.washcost.info – On MUS (multiple-use) water services visit: www.musgroup.net