

WATER, CRISIS AND CLIMATE CHANGE IN UGANDA: A POLICY BRIEF

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KEY MESSAGES:

CHALLENGES:

- Uganda's abundant renewable water resources are underdeveloped and under increasing pressure from population growth, economic development and urbanisation.
- Climate change will aggravate these problems, making Uganda one of the most vulnerable countries in Sub-Saharan Africa to the effects of climate change.

WATER CONFLICT POTENTIAL:

- These challenges, as well as misguided government policies, together with a history of marginalisation and conflict, lead to a heightened potential for water and pasture conflicts along the cattle corridor.
- Increasing land speculation in Uganda not only carries the potential for land but also water conflicts because of its significant impacts on water access and availability.

CONFLICT PREVENTION AND MANAGEMENT:

- To manage and prevent conflicts around water, alternative conflict-management approaches have been shown to be successful.
- These approaches are based on consensus principles and are more inclusive and participative than, for example, litigation through the legal system. They include, for instance, multi-stakeholder initiatives bringing local communities together with non-governmental organisations (NGOs) and government institutions.
- Water infrastructure development and water management have to be inclusive and conflict-sensitive. This can be achieved by sharing information and good practices with local communities, as well as by including them in decision-making processes and monitoring.

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ACRONYMS

ACF	African Conservation Foundation
ACORD	Agency for Cooperation and Research in Development
CREED	Collaborative Research in the Economics of Environment and Development
DRC	Democratic Republic of Congo
FAO	Food and Agriculture Organisation of the UN
IFPRI	International Food Policy Research Institute
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development
LIPRO	Livelihood Improvement Programme of Uganda
LRA	Lord's Resistance Army
NAPA	National Adaptation Programme of Action
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organisations
UNESCO	UN Educational, Scientific and Cultural Organisation
UNFCCC	UN Framework Convention on Climate Change
USAID	US Agency for International Development
UWA	Uganda Wildlife Authority
WACCAF	Water, Crisis and Climate Change Assessment Framework
WRI	World Resources Institute

1. INTRODUCTION

Although it is endowed with abundant renewable water resources, Uganda faces huge challenges in the water sector. Pressure on and competition around water resources are increasing. Such increasing competition can lead to conflict potential, especially if it results in unequal water access and availability and interacts with other conflict factors, such as marginalisation or past conflicts. At the same time water can also be a source of peace and cooperation if it is managed in an equitable and sustainable way.

This policy brief gives an overview of the challenges Uganda is facing in the water sector and their potential for turning into local conflicts by outlining some of the common and possible worsening conflict dynamics around water in Uganda. In order to identify ways forward and actions to prevent these challenges from turning into conflict, a number of innovative approaches and initiatives to solve and prevent water conflicts are illustrated.

The policy brief is based on and follows the structure of the Water, Crisis and Climate Change Assessment Framework (WACCAF) which was developed as part of the European Commission's Initiative for Peacebuilding – Early Warning (IfP-EW) Network.¹ It is targeted at practitioners from the public sector as well as NGOs and donor communities working on conflict and/or water.

¹ L. Ruettinger, A. Morin, A. Houdret, D. Taenzler and C. Burnley (2011). *Water, Crisis and Climate Change Assessment Framework (WACCAF)*. Initiative for Peacebuilding - Early Warning (IfP-EW): Brussels.

2. WATER AVAILABILITY AND ACCESS

This section outlines the major challenges in Uganda's water sector by focusing on the main factors impacting water availability and access: water management and infrastructure, the environment and human impact, and climate change.

2.1 THE ROLE OF WATER MANAGEMENT AND INFRASTRUCTURE²

Uganda is endowed with abundant renewable water resources amounting to 2085 m³/year,³ in principle well above the internationally recognised limit of 1000 m³/year for water scarcity.⁴ However, **the water sector in Uganda is strongly underdeveloped**: only 0.5 percent of the total available renewable water resources are currently withdrawn per year for use in agricultural (40 percent), municipal (43 percent) and industrial (17 percent) consumption.⁵

Uganda is a riparian state of the Nile and its wide basin of ten countries: Rwanda, Burundi, Uganda, Kenya, Tanzania, the Democratic Republic of Congo (DRC), Sudan, Egypt, Ethiopia and Eritrea. Each of these riparian states has a claim over the water usage of the river, albeit with unequal rights held by the lower-lying countries, especially Egypt. However, the existing 1929 and 1959 Nile Water Agreements gave Egypt 75 percent and Sudan 25 percent of the water, and nothing to the other riparian states.⁶

The **actual water available and accessible to different user groups is low, hampering human development**. Uganda has achieved some improvements to the supply of water and sanitation by increasing access to improved sanitation facilities from 39 percent of the population in 1990 to 48 percent in 2008. But this improvement was largely limited to rural areas (1990: 40 percent, 2008: 49 percent), while it almost stagnated in urban settings (1990: 35 percent, 2008: 38 percent).⁷ Uganda is still off track to achieve the Millennium Development Goal of reducing by half the proportion of people without sustainable access to safe drinking water and basic sanitation.⁸

Inadequate water supply also limits economic development as it is unable to support large-scale manufacturing industries and agro-processing factories. There are also significant problems with limited water access for livestock and lack of capacity for water harvesting for small-scale supplementary irrigation. In the rural water sector, examples of problems include limited borehole drilling capacity, low sustainability of infrastructure due to lack of adequate operation and maintenance structures, and limited spare parts distribution for the private sector.⁹

2 Unless indicated otherwise, this section is based on UN Educational, Scientific and Cultural Organisation UNESCO (2006). *Water: A shared responsibility*. UN World Water Development Report 2. Paris: UNESCO and New York: Berghahn Books. Available at unesdoc.unesco.org/images/0014/001444/144409e.pdf

3 Food and Agriculture Organisation of the UN (FAO) (2008). 'Aquastat. FAO's Information System on Water and Agriculture', accessed 14th December 2010. Available at <http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en>

4 This limit is based on a classification by M. Falkenmark, J. Lundqvist and C. Widstrand (1989). 'Macro-scale water scarcity requires micro-scale approaches' *Natural Resources Forum*, Vol. 13, No. 4, pp.258–67.

5 FAO (2008). Op. cit.

6 C. Kaamuli (2006). 'The Nile Water Utilization Conflict arising from the 1929 and 1959 River Nile Agreement'. Unpublished MA Dissertation, Makerere University.

7 World Bank (2010). 'Data: World Development Indicators', accessed on 15th December 2010. Available at <http://data.worldbank.org/data-catalog/world-development-indicators>

8 African Development Bank (2010). 'African Economic Outlook', accessed 15th December 2010. Available at <http://www.africaneconomicoutlook.org/en/outlook/>

9 (UNESCO) (2006). Op. cit.

Uganda's water sector has been under reform since 1998, but despite all efforts it is still deficient.

Problems include inadequate financial resources, lack of capacity, limited private-sector capacity to cope with increased water and sanitation activities, weak coordination and management at the level of national and local governments, and inadequate involvement of local communities in activities related to the development of community-based water and sanitation.¹⁰

2.2 THE ENVIRONMENT AND HUMAN IMPACT

Uganda's **population growth** rate is 3.24 percent, the 4th highest in Sub-Saharan Africa, and it is predicted to stay high with a projected rate of 2.36 percent by 2030 compared to the projected average rate for Sub-Saharan Africa of 1.71 percent.¹¹ Based on projected population growth, the total renewable water resources of the country per capita are expected to drop to 1072 m³/year by 2030, on the brink of a regime of water scarcity – especially in arid and semi-arid regions.

Urbanisation is exacerbating these problems with respect to both spatially concentrated high demand and pollution from sewage. And it is progressing fast, with the percentage of the total population living in urban settings increasing steadily from 7.5 percent in 1980 to 13.3 percent in 2010 to projected 20.7 percent in 2030.¹²

Ecosystems like forests and wetlands perform important functions in the water cycle such as filtering and storing water. The **degradation of these ecosystems** is closely linked to population growth and urbanisation and impacting water availability and access. More than a quarter of Uganda's forest cover disappeared between 1990 and 2005 due to increasing demand for land, fuel and food, combined with policy failures, uncontrolled timber harvesting and the conflict with the Lord's Resistance Army (LRA). If this deforestation continues at the current rate, by 2050 no forest cover will be left.¹³ Together with overgrazing and agriculture, deforestation has led to 62 percent of the total land area already being severely or very severely degraded.¹⁴ In addition, pressure on wetlands is also rising, for example, the Jinja district in eastern Uganda is estimated to have lost about 80 percent of its wetlands.¹⁵

These high levels of degradation are strongly interlinked with **high degrees of poverty**. In 2003 the poverty rate was 37.7 percent. While it was only 12.2 percent for the urban population, it amounted to 41.7 percent of the rural population. These high poverty rates often go hand in hand with a lack of financial and technological capacity for sustainable resource use and destructive coping strategies and overuse to provide for a livelihood.¹⁶

A final problem is **pollution** of water resources, especially in and around Lake Victoria. Main sources of pollution are poor agricultural practices that increase sediment loads and nutrient run-off, leading to eutrophication and proliferation of aquatic weeds, such as water hyacinth, as well as poor sanitation practices, industrial waste discharge and some mining activities.

2.3 THE ROLE OF CLIMATE CHANGE

Models of future impacts of climate change agree on an increase of mean annual temperature of 1–3.1°C by the 2060s and 1.4–4.9°C by the 2090s. There is a broad consensus that annual rainfall will increase by about 7 to

10 Ibid.

11 World Resources Institute (WRI) (2007). 'EarthTrends'. The Environmental Information Portal. Washington, D.C.: World Resources Institute, accessed on 15th December 2010. Available at <http://earthtrends.wri.org/>

12 Ibid.

13 National Environment Management Authority (NEMA) (2008). *National State of Environment Report for Uganda 2008*. Kampala: NEMA Uganda.

14 FAO (2000). 'Land resource potential and constraints at regional and country levels'. *World Soil Resources Report, No. 90*. Rome: FAO, accessed 15th December 2010. Available at <ftp://ftp.fao.org/agl/agll/docs/wsr.pdf>

15 NEMA (2008). Op.cit.

16 A. Duraipah (1996). 'Poverty and environmental degradation: A literature review and analysis'. *Collaborative Research in the Economics of Environment and Development (CREED) Working Paper Series No.8*. Amsterdam: International Institute for Environment and Development (IIED). Available at <http://pubs.iied.org/pdfs/8127IIED.pdf>; S. A. Vosti and T. Reardon (Eds.) (1997). *Sustainability, growth, and poverty alleviation: A policy and agroecological perspective*. Baltimore and London: International Food Policy Research Institute (IFPRI), The Johns Hopkins University Press.

11 percent in the 2090s.¹⁷ Highest increases in rainfall will be in the “short rain” season (October to December), possibly leading to a shift in the seasonality of rainfall, with a more pronounced rain period in the autumn and the rest of the year being hotter and drier. This will most likely lead to an **increased lack of reliability in water availability**, even if total precipitation increases. Agriculture, which especially in the bimodal rainfall zone¹⁸ is dependent on stable rainfall seasons, will become more difficult, with higher risks of losing harvests due to too much or too little rain. This is exacerbated by failures of traditional weather-forecasting systems and lack of access to modern ones.¹⁹ In addition, a higher percentage of rain will fall in heavy events, and **extreme events such as floods and droughts will increase in severity and frequency.**²⁰

Available water quantities around Uganda’s lakes are highly sensitive to climate effects.²¹ This is especially the case for Lake Victoria, where a continued decrease of levels until the 2030s is expected to be followed by an increase by the 2080s, though uncertainties are high.²² Recent steep drops in lake levels since around 2000 are probably only partially related to drought conditions, and mostly due to increased releases at the Owen Falls dam.²³

In addition, **water quality in lakes and rivers** will also be affected by rising water temperatures leading to lower oxygen and increased phosphorus concentration as well as changing nutrient levels.²⁴ Rising temperatures and **decreasing glaciers in the Rwenzori mountains** will lead first to an increase and then to a decrease in the water flows of the Semliki River.²⁵

The **capacities to adapt to and manage these changes** are weak. Infrastructure for housing, industry and transportation, as well as institutional capacity, disaster-management capacities and financial resources, are limited.²⁶ At the same time, Uganda has a high dependence on natural resource use and primary production. Agriculture plays an important economic role, employing 76 percent of the workforce,²⁷ and it is mainly subsistence and rain-fed agriculture.²⁸ Coffee and Fishing are sectors creating important export revenues,²⁹ but they are highly climate-sensitive. The high exposure and low adaptation capacities put **Uganda among the countries of Sub-Saharan Africa most vulnerable to the effects of climate change.**

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- 17 Note that the spread between models and the uncertainties stemming from the complex interactions, lack of historic data and computational challenges are large. Some studies do predict declining precipitation, e.g. a decline by 10 percent in the second half of the century. T. Beyene, D. P. Lettenmaier and P. Kabat (2010). ‘Hydrologic impacts of climate change on the Nile River Basin: implications of the 2007 IPCC scenarios’. *Climatic Change*, Vol. 100, pp.433–61. Available at http://www.ce.utexas.edu/prof/mckinney/ce397/Topics/Nile/Beyene_etal_2007.pdf
- 18 Most of Uganda has two rainfall seasons (thus the term bimodal) – the “short rains” from October to December, and the “long rains” from March to May. The semi-arid regions, mainly in the northeast, are subject to a dry period between November and March and a single longer wet period with erratic, highly variably rainfall the rest of the year. D. Conway and M. Hulme (1993). ‘Recent fluctuations in precipitation and runoff over the Nile sub-basins and their impact on main Nile discharge’. *Climatic Change*, Vol. 25, No. 2, pp.99–114; C. McSweeney, M. New and G. Lizcano (2010). ‘The UNDP Climate Change Country Profiles: Uganda’, accessed 14th December 2010. Available at <http://country-profiles.geog.ox.ac.uk>; Republic of Uganda (2007). ‘Climate Change. Uganda National Adaptation Programme of Action (NAPA)’. United Nations Framework Convention on Climate Change (UNFCCC), accessed 14th December 2010. Available at http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php
- 19 N. Hepworth and M. Goulden (2008). *Climate Change in Uganda: Understanding the implications and appraising the response*. Edinburgh: LTS International. Available at http://reliefweb.int/sites/reliefweb.int/files/resources/7F1BF4A7CF37F6A54925756F0016ED29-Full_Report.pdf; J. Magrath, S. Carvalho, R. M. Nkuba, A. Nkubito and J. Wangoolo (2008). ‘Turning up the heat: Climate change and poverty in Uganda’, accessed 20th June 2011. Kampala: Oxfam GB in Uganda. Available at http://www.oxfam.org.uk/resources/policy/climate_change/downloads/ugandan_climate_change.pdf
- 20 N. Hepworth and M. Goulden (2008). Op. cit.; J. Magrath, et al. (2008). Op. cit.; C. McSweeney, et al. (2010). Op. cit.
- 21 D. Conway and M. Hulme (1993). Op. cit.
- 22 E. Tate, J. Sutcliffe, D. Conway and F. Farquharson (2004). ‘Water balance of Lake Victoria update to 2000 and climate change modeling to 2100’. *Hydrological Sciences*, Vol. 49, No. 4, pp.563–74.
- 23 D. Kull (2006). ‘Connections between recent water level drops in Lake Victoria, dam operations and drought’. Berkeley: International Rivers, accessed on 7th July 2010. Available at <http://www.internationalrivers.org/files/060208vic.pdf>; J. V. Sutcliffe and G. Petersen (2007). ‘Lake Victoria: Derivation of a corrected natural water level series’. In: *Hydrological Sciences Journal*, Vol. 5, No. 6, pp.1316–21.
- 24 A. Fischlin, G. F. Midgley, J. Price, R. Leemans, B. Gopal, C. Turley, M. Rounsevell, P. Dube, J. Tarazona and A. Velichko (2007). ‘Ecosystems, their properties, goods and services’. In: M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden and C. E. Hanson (Eds.). *Climate Change 2007. Impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. pp. 211–72. Available at http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml
- 25 N. Hepworth and M. Goulden (2008). Op. cit.
- 26 N. Hepworth and M. Goulden (2008). Op. cit.; (NEMA) (2008). Op. cit
- 27 (FAO) (2008). Op. cit.
- 28 (UNESCO) (2006). Op. cit.
- 29 Both are highly vulnerable to climate change. If temperatures increase by more than 2°C, coffee production could effectively disappear in Uganda (J. Magrath, et al. (2008)). Studies on fishing yields show a non-linear relationship to lake productivity, with 30 percent declines in yields caused by 20 percent decreases in production (C. M. O’Reilly, S. R. Alin, P.-D. Plisnier, A. S. Cohen and B. A. McKee (2003). ‘Climate change decreases in aquatic ecosystem productivity of Lake Tanganyika, Africa’, *Nature*, Vol. 424, pp.766–68).

3. CRISIS AND CONFLICT POTENTIAL

How these challenges in regard to water access and availability can lead to crisis and conflicts is shown in this section. The four examples here are not comprehensive but rather serve as illustrations for common conflict patterns and dynamics in Uganda. In general, decreasing natural resources combined with population growth have increased competition around land and water. The following examples show how **this competition can turn into conflict when it converges with other conflict factors such as the marginalisation of certain population groups or government policies that are perceived as unjust.**

3.1 PASTORALIST CONFLICTS IN THE KARAMOJA REGION

The Karamoja region is one of the most hostile and environmentally fragile areas of Uganda and located in the northeast, bordering Kenya. Water and pasture were always scarce in this region, but the local population of pastoralists called the Karamojong had adapted to this environment by constantly moving. However, beginning with colonialism communal lands increasingly became state or privately owned, thus restricting the movement of pastoralists. **Available and accessible pasture and water became scarcer** and the pastoralists were forced to increasingly move to marginal or populated areas. Together with overall population growth, this led to increasing pressure on the available land and water and eventually to overuse and degradation.³⁰

At the same time the Karamojong, regarded and stigmatised as backwards, have been continuously denied state support, access to public services, and public security. Furthermore, the government favoured development policies that restricted pastoralists' access to water and pasture. In a region awash with small arms from conflicts in northern Uganda, Sudan and Somalia, this mixture of increasing competition over land and water on the one side and marginalisation, insecurity and the absence of the rule of law on the other, created **a vicious cycle of violence and conflict in which more and more pastoralists took up arms to secure their livelihoods.** This has gone hand in hand with the development of a conflict economy, further undermining security and dissolving the traditional culture and social structures of the Karamojong.³¹

The conflict structure is complex and **conflicts arose between different actors.** First, the Karamojong started to encroach on agriculturalists' lands surrounding their traditional pastures and raided their cattle. Second, different pastoralist communities increasingly started to raid each other. Third, intra-community violence and conflict often in the form of theft of livestock and property rose. Fourth, with rising insecurity, the government intervened heavy-handedly by deploying police and the military, leading to confrontations with pastoralists.³²

As the population increases further and the effects of climate change continue to change seasonal patterns, increase temperatures and the frequency and intensity of drought, water resources are likely to become less available. Thus, **climate change might potentially increase the risk for violent conflicts and/or aggravate the existing conflict dynamics.**

30 Oxfam GB (2000). 'Oxfam Karamoja Conflict Study: A Report', accessed 20th June 2011. Available at <http://www.oxfam.org.uk/resources/learning/pastoralism/resources.html>

31 D. Akabwai and P. E. Ateyo (2007). *The scramble for cattle, power and guns in Karamoja*. Feinstein International Center; C. Mwaura (2005). 'Kenya and Uganda Pastoral Conflict Case Study'. Human Development Report Office, Occasional Paper, UNDP. Available at http://hdr.undp.org/en/reports/global/hdr2005/papers/HDR2005_Mwaura_Ciru_20.pdf

32 Saferworld (2010). 'Karamoja conflict and security assessment'. London: Saferworld.

3.2 CONSERVATION-BASED CONFLICTS

In Uganda, conservation areas make up 26.4 percent of the total land mass.³³ **Growing pressures from increased population, degrading natural resources, in particular land and water, and shrinking communal lands have led to a number of conflicts around these areas.** While these dynamics play a role in the pastoralist conflicts in the Karamoja region, they also occur in other parts of Uganda along the cattle corridor. This corridor of traditional communal land stretches from the northeast to the southwest and extends over one quarter of Uganda's total area. It is used by different pastoralist groups for grazing and water. However, since colonial times, access to these communal lands has become increasingly restricted with the lands being converted into public and private land.³⁴

One illustrative example is the Kasese district in Western Uganda, where 65 percent of all land is held by the government. These public lands include conservation areas such as game parks, forest reserves and national parks as well as prison farms and land used by different government institutions. One of the largest conservation areas in Kasese, the Queen Elizabeth National Park, was established in 1952. When it was created, the **Basongora pastoralists living in the park lost large parts of their communal land and homes.** In the following decades, many of the communal lands outside the park were privatised and pastures converted into farmland.³⁵

Since their displacement, the Basongora have been moving in the region in search of water and pasture, creating conflicts with local cultivators as well as with the government. The conflict with the government escalated in 2006 and 2007 when a group of Basongora who moved to Virunga National Park in the DRC in 1999 was evicted from there and moved back into Queen Elizabeth National Park.³⁶ Violent clashes occurred when the Ugandan Wildlife Authority (UWA) tried to push the pastoralists out of the park.³⁷ Finally, the pastoralists were resettled to areas outside the national park. This led to subsequent conflicts with local farming communities in the receiving areas and the feeling of injustice and insufficient compensation on the part of the Basongora.³⁸ **Fuelled by tenure insecurity and lack of alternative livelihoods, these conflicts will continue or increase as the pressure on available land and water grows.**

3.3 WATER GRABBING

As the two examples above show, land and water are closely linked, blurring the distinction between water conflict and land conflict. This is also the case in what is often called "land grabbing" – the large-scale purchase or leasing of land often by, but not limited to, foreign investors. These deals are often contentious and/or on a scale that is disproportionate in size in comparison to the average land holding in the region.³⁹ **Some observers point out that land grabs are also water grabs, since these investments are mainly done for fertile, water-rich lands and thus mostly have a significant impact on water access and availability.**⁴⁰

In Uganda, land grabbing and land speculation are increasing.⁴¹ **Water conflicts in this context typically arise between local communities and private companies over access to water or because of negative**

33 EarthTrends (2003). 'Biodiversity and Protected Areas. Uganda. Country Profiles', accessed 20th June 2011. Available at http://earthtrends.wri.org/pdf_library/country_profiles/bio_cou_800.pdf

34 M. A. Rugadya (2009). *Escalating land conflicts in Uganda. A review of evidence from recent studies and surveys*. International Republican Institute and Uganda Round Table Foundation.

35 N. Nabetta (2009). *Common Pool Resource Conflicts: Conventional Perspectives to the Bagungu/Balalo-Basongora Conflict in Uganda*. Makerere University Business School.

36 UWA (2007). 'Uganda Wildlife Authority Statement on Basongora Pastoralists', accessed on 20th June 2011. Available at <http://www.newvision.co.ug/D/526/532/571111>

37 M. A. Rugadya (2009). Op. cit.

38 Minority Rights Group International (2008). 'World Directory of Minorities and Indigenous Peoples – Uganda: Basongora', accessed 20th June 2010. Available at <http://www.unhcr.org/refworld/docid/49749c9237.html>

39 A. Graham, S. Aubry, R. Künemann and S. Monsalve Suárez (2010). *The role of the EU in land grabbing in Africa – CSO Monitoring 2009–2010 "Advancing African Agriculture" (AAA): The Impact of Europe's Policies and Practices on African Agriculture and Food Security*. Land Deals Politics Initiative (LDPI).

40 C. Smaller and H. Mann (2009). *A thirst for distant lands. Foreign investment in agricultural land and water*. Canada: International Institute for Sustainable Development (IISD). Available at http://www.iisd.org/pdf/2009/thirst_for_distant_lands.pdf

41 US Agency for International Development (USAID) (2009). *Uganda. Country Profile. Property Rights and Resource Governance*. USAID. Available at usaidlandtenure.net/usaidltp/products/country-profiles/uganda/

impacts on water resources such as pollution. Private companies are often backed by the government since their investments promise economic development and revenues. For example, in Mubende, the German coffee trader Neumann Kaffee Gruppe established a coffee plantation under a local subsidiary. Backed by the government as part of their plan to modernise agriculture and to convert subsistence into commercial agriculture, around 400 families were evicted, losing their homes and livelihoods including access to clean water.⁴²

Ambiguous land rights, a weak judiciary and corruption exacerbate these conflict dynamics by making it harder for marginalised or less powerful groups to ascertain their rights to land and water and making it easier for powerful groups to circumvent existing regulations.⁴³ For example, at Lutembe Bay, a Ramsar wetland site on the shores of Lake Victoria, the flower company Rosebud destroyed parts of a wetland to set up a greenhouse and fenced off the rest of the wetland in violation of existing environmental laws. One result of this was that local communities were deprived of their traditional domestic water supply and fishing grounds by being denied access to the wetlands.⁴⁴

42 A. Graham, et al. (2010). Op. cit.

43 M. A. Rugadya (2009). Op. cit.

44 African Conservation Foundation (ACF) (2008). 'Nature Uganda. Lutembe Bay Ramsar site fenced for flower growing', accessed 20th June 2011. Available at <http://www.africanconservation.org/200808181447/network-news-section/natureuganda-lutembe-bay-ramsar-site-fenced-for-flower-growing>

4. COOPERATION, CONFLICT PREVENTION AND RESOLUTION

The previous sections have outlined the challenges around water, crisis and conflict in Uganda, and this last section offers some solutions for preventing and resolving conflict around water. The following examples are not comprehensive but illustrate some of the good practices of how **sustainable, inclusive and transparent planning and management of water and ecosystems can transform conflict into cooperation.**

4.1 SUSTAINABLE AND PARTICIPATORY WETLAND MANAGEMENT

A successful example of how to solve and prevent conflicts around water resources is the case of the Kagango wetland located in the Sheema district. The local government evicted community members who were using the wetland for different livelihood activities ranging from brick making to tree cutting and cultivation. From an environmental and legal standpoint, this move was justified as the community overexploited the wetland, broke the law and posed a serious threat to the ecosystem. However, **as they were left with no alternative livelihoods, the tensions between the community and the government rose.**

To prevent this conflict from escalating, the local NGO Livelihood Improvement Programme of Uganda (LIPRO) intervened and **brought the conflicting parties together in order to identify possible solutions and alternative livelihoods** that would not threaten the ecosystem. A number of activities, such as providing information and training to enable community members to pursue other sustainable economic activities like beekeeping and fish farming, were identified. In addition, specific interventions to preserve the wetland and contribute to local livelihoods, such as planting trees in and around the wetland, were found.

The success of this intervention was dependent on the cooperation of the stakeholders and sharing of responsibilities. The NGO provided tree species which community members could plant both in the wetland and on their own land; the stakeholders jointly established representative committees involving the different interest groups; the local government seconded extension staff who not only guided the planting and preservation of the trees but also regularly participated in committee meetings. On a more general level, this successful intervention can provide some lessons on how to better formulate new and effective strategies, as well as persuade the local population to form lasting alliances with the government for conservation and sustainable use of natural resources on the basis of equal participation and responsibility and thus prevent and solve conflicts around natural resources.

4.2 CONFLICT-SENSITIVE WATER INFRASTRUCTURE DEVELOPMENT

Setting up water infrastructure can be a conflict-prone process. This was also true in the case of the Auakoro gravity water scheme. The source of water for this scheme was used by local communities for brick making and a number of economic activities that had developed around it, such as fetching of water for the brick makers. The government was aware of the potential conflict a water scheme could create with the local communities using the source. **To prevent a conflict over competing water uses, the government started an information campaign** trying to show the community that the water scheme would not negatively impact the water resource and would have many positive effects – especially for other communities downstream.

This was mainly done by the District Water Office which provided training for a number of village members. The training also included a field trip to a piped water system in Paidha, Zombo district, where the participants could see a successful water scheme and talk to the different beneficiaries. On returning from the training and the field trip, the local council chairperson and other participants informed village members about the system and its positive effects, and that the gravity scheme could be constructed without creating a conflict. **The inclusion of the local community in the planning process and providing the right information prevented conflict and also created a sense of ownership for the project in the community.**

However, while the construction of the water scheme was successful, problems occurred later during the management of the scheme. A number of taps in the villages close to the source broke and the residents could not access water, with the consequence that women had to look for alternative water sources. Protests by the communities created pressure on the local government which reacted by repairing the water taps and reviving the sub-county water coordination committees which now meet more regularly to monitor the water schemes.

4.3 MANAGING WATER AND CONFLICT

As the example of the Auakoro gravity water scheme shows, **conflict sensitivity is decisive during the initial planning and construction of water infrastructure, but also during subsequent maintenance and management of such a system.** This is also a lesson learned from the Nyabikungu Central Gravity Flow Scheme located in Mbarara district, which was constructed as a response to the water scarcity in the area and designed to deliver water through a 33-km-long plastic pipe to approximately 10,650 people.

However, after just a few months of service, some of the beneficiaries of the scheme started complaining that they were receiving no water. On scrutiny, it was discovered that there were a significant number of “illegal” connections on the scheme. The number of taps had risen from the original 71 to 180. **A synergetic partnership between Water Aid in Uganda, Agency for Cooperation and Research in Development (ACORD), Kyera Farm Training Centre and the Rugando community advocacy committee was formed to address the problem.** Once the cause of the problem – plumbers and members of the management committee was identified – the following actions were taken: the mobilisation and empowerment of water users to communicate the problem of illegal taps to a larger audience through the media, a survey to identify all illegal connections, and finally the involvement of local government and the management and advocacy committee supported by local NGOs to jointly work out a sustainable solution for the monitoring problem. A compromise was found and the District Water and Sanitation Coordination Committee instituted a by-law to install meters at all illegal connections in order to be able to charge the guilty parties.

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