

13 THE USE OF DOMESTIC WATER SUPPLIES FOR PRODUCTIVE PURPOSES IN THE LAKE CHILWA CATCHMENT AREA IN SOUTHERN MALAWI

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Summary

Domestic water supplies are used not only for the traditional purposes of drinking, cooking and washing but they are also utilized for a variety of 'non-domestic' uses. In the Lake Chilwa Catchment area in southern Malawi, domestic water is increasingly being used for dry-season gardening, brick-making, livestock watering and small-scale business enterprises. These activities constitute an important element in the livelihoods of both rural and urban communities. Understanding the importance of multiple uses of water, in the lives of people in developing countries, has implications for how water supply systems are developed and how water resources are managed. This paper reports on these issues from a wider research study on water resources management conducted, in southern Malawi. It is based on data collected through focus group discussions, key informant interviews, and field observations.

13.1 Introduction

One of the major characteristics of poor countries is the lack of adequate or good quality water for domestic basic use. But this should not obfuscate the fact that people do use domestic water supplies for a wide range of 'non-domestic' purposes. This has become an important mechanism for families to earn money in many developing countries.

This paper examines ways in which domestic water supplies are being used for productive purposes in a part of Malawi. The concept of domestic water is not so easy to define; much depends on what individual users in different countries consider as 'domestic'. For example, the Malawi Government defines domestic water use as "the provision of water for household and sanitary purposes and for the watering and dipping of stock" (GOM, Draft Water Act, 1999, part 1:1). However, in other water-stressed areas, the provision of water for watering and dipping of stock may not be accepted as domestic use at all.

At the international level, attempts have been made to identify central aspects that characterise domestic water use. The United Nations International Drinking Water Supply and Sanitation Decade of the 1980s and the Agenda 21 of the Earth's Summit in 1992 recommended a per capita requirement of 25 l per person per day. That requirement is for basic human needs of drinking water and sanitation only. But in order to meet the four domestic basic needs of drinking, sanitation, bathing and cooking, then the figure goes up to 50 l per person per day (Gleick, 2000). Although that figure is far from being realized, it is an important goal to strive for in order to meet the minimum quality of life for the majority of the people in developing countries.

This paper argues that 'non-domestic' uses of water constitute an important element in the lives of both rural and urban communities. As this study shows, even where people have water supplies that are barely sufficient for basic needs, they tend also to use water for productive purposes. This is due to the need to earn money and grow food in situations of poverty.

13.1.1 *Poverty and water in Malawi*

It is a cliché now to mention that Malawi is one of the poorest countries in the world (UNDP, Malawi National Human Development Report, 2002). Poverty is manifested in the low levels of economic growth, declining levels of real income and rising unemployment, among other factors. The global Human Development Report showed that Malawi had a GDP per capita of US \$270 in 2000 and the country was ranked twelfth poorest in the world as measured by the Human Development Index.

In Malawi, the poor are found in both urban and rural areas with the latter accounting for the largest share. The poor live under very difficult conditions, often without access to basic social services. By looking at all the indices it will be clear that Malawi is a poor country. Poverty has also been recognized as a major challenge to Malawi's development programme. In order to understand the nature and extent of poverty in Malawi, we need to go beyond economic indicators. Msukwa et. al. (1993) emphasise the

use of social indicators such as literacy, health and nutritional status across the rural-urban nexus to appreciate the causes and consequences of poverty.

For example, Malawi has a literacy rate of 58% of adults who are able to read and write at least one particular language. According to the Malawi Population and Housing Census of 1998, about 2.7 million (or one third of total population aged 5 years or older) had never attended any school and 4.9 million or 59% had attended primary school. Similarly, the 1980/81 National Sample Survey of Agriculture showed that over 56% of pre-schoolers were chronically malnourished. Life expectancy was only 45 years in 1995 and believed to have been declining in the years after that. Infant mortality rate stands at 134 deaths per 1000 live births, with child mortality rate (1-4 years) at 115 deaths per 1000 (Demographic & Health Survey, 1994).

It is important to note that poverty is neither unique to Africa nor is it necessarily a product of the post-colonial period. Poverty has existed for a long time. What is new is the magnitude of the problem and the susceptibility of certain groups of people to be entrapped into poverty. In addition, there has been a decline in access to resources, such as water, that could be used to mitigate against poverty. The National Human Development Report for 2001 indicates that although 48% of the population had access to potable water sources, the actual access to potable water supply is as low as 32% due to breakdown, drying up of water sources as well as problems of operation and maintenance. Furthermore, other factors, including population growth, unreliable rainfall, declining agricultural productivity and an expanded demand for water, are putting pressure on water resources. Although many Malawian people do not consider water as an economic good, they use it as a means to generate income. This point is important, given the tremendous policy changes that have taken place in the last decade or so, emphasizing a demand-driven approach to water supply. But the removal of support mechanisms for the poor, which traditionally used to come through subsidized water supply and sanitation programmes, are adversely affecting poor people.

In the colonial and pre-colonial periods, poor people are those that, due to their position in the social and economic strata, found themselves incapable to access resources for survival. Invariably, these included the elderly, infirm, women and children. The most insidious form of poverty that persists to the present day is structural poverty as opposed to conjunctural poverty. The latter happens due to spontaneous and unexpected events such as drought and floods (Iliffe, 1987).

Although the international perspective on management of water resources has shifted from supply-side concerns to demand management ones, emphasizing conservation of watersheds and efficient use of existing water resources, little water-related infrastructure exists in Malawi. The new water policy statement notes that:

Malawi is heavily dependent on run-of-the-river schemes, whether the use is for hydro-power, irrigation, water supply, navigation, etc. There are no major storage dams despite existing potential and need. However, there are small reservoirs with storage capacity ranging between a few cubic metres and about 5 million cubic metres, which have been constructed for water supply, irrigation and conservation purposes. These dams total about 700 in number with a total storage of less than 1,000 million m³ or 1 km³ (GOM, WRMPS, 2000:4).

This means that lack of infrastructure militates against the supply of water to most people, who need it for domestic purposes, and the majority of these people are the poor.

Although international reports identify Malawi as one of the Southern African countries likely to experience absolute water scarcity by 2025 (Ohlsson, 1995), this estimation appears to reflect infrastructure and distributional problems more than actual scarcity. The country has an extensive network of rivers and lakes, with water bodies covering more than 21% of the territory. Much of this water is found in Lakes Malawi, Malombe, Chilwa and Chiuta. The *Country Situation Report on Water Resources* in Malawi (Kaluwa *et al.*, 1997) indicates that there are renewable freshwater resources of about 3,000 cubic metres per capita per year, but that the distribution across the country is irregular and varies by season and year. Ninety% of the run-off in rivers and streams occurs between December and June, and only 0.1% of this is estimated to be captured for later use.

As in many other countries in the developing world, access to potable water in Malawi remains limited. The new Water Resources Management Policy and Strategies (GOM, 1999) paper reports that:

The existing urban and rural water supply schemes and systems provide access to potable water facilities for up to 54% of the country's population, which reduces to 32% with access to potable water at any one time due to breakdowns, drying up of sources and other operational and maintenance problems (1999:4).

Given that less than half of the population has access to safe portable water, the few sources available remain potential areas of conflicts. Conflicts occur over access to and use of water resources. There have been cases of both latent and overt disputes over the use and management of water for domestic and productive sources in the Lake Chilwa area (Mulwafu and Khaila, 2001).

Only 5.5% of the population has adequate sanitation, and 30% has no sanitation at all. In urban areas coverage is greatest, with approximately 30% of the population having access to adequate sanitation. In Zomba District, while 88% of the population has access to "some form of sanitation," only 5.5% have "access to adequate sanitation" (Kaluwa *et al.* 1997:43-5). Release of untreated sewage directly into rivers and streams is a major cause of water pollution in Malawi.

13.2 Methodology and description of the research area

The paper is a product of a wider research study on the socio-economic aspects of water resources management being conducted in the Lake Chilwa Catchment in southern Malawi. The overall objective of the BASIS Collaborative Research Support Program research focuses on land and water issues as they relate to irrigation. We are looking at both formal and informal irrigation. In the formal sphere, the study looks at the process of transferring irrigation schemes to farmers. Questions of tenure and titling have arisen as there are disputes between irrigation scheme farmers and chiefs who claim the land as theirs. The handing over process has already kindled these types of disputes in some places. We have selected the Domasi and Likangala Irrigation schemes in Machinga and Zomba Districts for this study. In the informal sphere we are focusing on dimba gardens and dambos. These sites of production are almost always left out of the irrigation literature although they constitute a major portion of the irrigated land among smallholder farmers in Malawi. We are also looking at customary tenure arrangements and use rights for these valuable parcels of land, paying close attention to how the new land law affects rights, access and ultimately production.

The basic method of conducting this research was an extensive and critical review of policy documents and relevant literature on water resources in Malawi. This was done in order to discern what is already known about the subject matter and so avoid repetitions; to establish gaps in knowledge that may need to be addressed; and to unravel other pertinent research issues.

The second method involved baseline surveys which were administered to obtain additional information from water users in the area. A set of questionnaires on water sources, irrigated agriculture, income and food security were designed and administered to farmers and water users who were purposefully sampled in order to collect data from key stakeholders.

In addition to surveys, qualitative information was collected by field assistants who are resident in the research sites. This approach uses basic social science methods such as focus group discussions, key informant interviews, and field observations.

Lake Chilwa Catchment is situated in the southern region of Malawi. The entire size of the catchment is about 8,349 square kilometres of which 5,582 (68%) is in Malawi. It has a population of 916,447 and about 77,000 people actually live in the wetland. The lake itself is about 627 meters above sea level.

It is an inland lake that gets most of its water from rivers that originate in the Zomba and Mulanje mountains. All the rivers are perennial in their upper reaches, but by the time they get to the Chilwa-Phalombe Plains, some only flow seasonally (GOM, 1998). Lake Chilwa is an important area of study for several reasons. The catchment itself was designated a wetland of international importance when the Malawi Government ratified the Ramsar Convention in 1997. This requires Malawi to use the wetlands in a wise and sustainable manner for the mutual benefit of both human beings and other natural properties in the ecosystem. The recent Lake Chilwa State of the Environment Report has also documented the environmental resources and changes in the catchment area and charted out a wetland management plan and strategies for intervention.

13.3 Findings: The use of domestic water for productive purposes

The provision of water to meet the minimum requirement for domestic purposes is obviously necessary to reduce the incidence of diseases and to improve the lives of people. Although Malawi has a per capita domestic water use of 29.7 l per person per day, our study suggests that the figure may be even lower for the Lake Chilwa area. This is because of problems of water scarcity. The rainfall pattern is very erratic and unreliable. The lowland areas of the wetland receive between 800 and 900 mm per year (GOM,2001). In addition, water sources are few and far apart, as can be seen in the Table 1. The major domestic water sources in Lake Chilwa include rivers, boreholes, stand pipes, taps and wells.

Table 1: Water points along the Likangala catchment area

	Covered well	Open well	Boreholes	Taps
Urban	2	2	5	2
Peri-urban	Nil	1	4	3
Estates	3	5	2	2
Irrigation	4	8	3	Nil
Fisheries	3	3	2	Nil

Domestic water sources are provided by the individual users, government and non-governmental organizations, with different requirements and responsibilities on the users. People have a variety of use rules for these sources. As Joe Degabrielle (2000) has noted in his study of boreholes in Malawi, one of the conclusions drawn from an analysis of the Water Decade is that the provision of more water sources may not necessarily lead to an improvement of peoples' lives. In Malawi, more than 30,000 boreholes have been drilled since the 1980s and yet more than 30% are dysfunctional. What is more, the supply of water does not proceed without its own challenges. In colonial Botswana and Zimbabwe, water supply became a political weapon for the elite communities. Politically and economically powerful groups tend to control access to water sources for their own interests (Cleaver, 1995; Peters, 1984).

Scholars in other contexts have tackled this issue. For example, Cleaver bemoaned the persistent use of a dichotomous classification of water into productive and domestic sub-sectors arguing that more often than not, this division does not help us much in understanding the power relations involved in water resource management (Cleaver, 1995; 1998 p.294). In addition, the approach is so technocratic that it tends to focus on formal user groups and in the process leave out women's participation. Cleaver argues that a gendered approach would underscore the role of women in water resource management and their efforts in alleviating their poverty. Moreover, the focus on water as an economic good leads to an underestimation of the importance of domestic uses. This is because while economic benefits of productive water can be easily quantified, the health and social impact of improved domestic supplies are difficult to enumerate.

Another issue emerging from our study is the prioritization of the use of domestic water supplies. Most of our respondents mentioned that, in order of priority, the following are the key uses: human needs (drinking, cooking, bathing and sanitation); beer making and livestock watering; gardening and brick making.

.Table 2. Seasonal variations in water sources along the Likangala catchment area

Research site	Perennial	Seasonal
Urban	3	3
Peri-urban	2	4
Estates	4	4
Irrigation	7	6
Fisheries	2	5
TOTAL	18	22

(Source: BASIS Research, 2001).

The two tables above give an indication of the state of water sources along the Likangala River catchment within Lake Chilwa. For an area of about 100 villages and a population of over 80,000, this is a very small number of water sources. Of course, this does not include the population in the Municipality of Zomba, most of whom are supplied with piped water facilities. But for the majority of the people in the lower part of the river, which is also mostly rural, Likangala River is their major source of water.

13.3.1 Brick making

Brick making, dry-season gardening, livestock watering and beer brewing are some of the commonest productive uses of water in the Lake Chilwa basin. Most of the brick making is done along the major rivers and streams in the area although this activity also takes place in other areas as well. Sometimes people use water from taps, wells, boreholes and irrigation canals.

Most of the bricks made are not used locally for building houses. They are sold to urban and peri-urban areas where there exists a thriving building industry and better prices are offered. In June 2001 the price of bricks was K600 (or US \$8) per 1,000 burnt bricks and this includes labour charges for packing bricks into the lorries. Most of the time the turn up of buyers for bricks is spontaneous and this results in the emergence of grumbling and conflicts among brick makers in an attempt to gain access to brick markets. This situation sometimes leads to people selling bricks at give away prices as buyers take advantage of the poorly organized brick makers.

Brick making is an important alternative source of income for the people. Moreover, it is not an exclusive activity of men; women also take part in the enterprise. However, it is interesting to note that most of the women involved in this activity are family heads or widows. Many informants observed that family responsibilities and poverty are the key factors for their participation in brick making activities.

Brick making has both a negative and positive impact on the environmental status of the area. Although this activity provides an alternative source of income to those involved, it contributes greatly to soil erosion and water pollution of the Likangala and Domasi Rivers and Lake Chilwa. Brick making has resulted in deforestation, creation of gullies, and the removal of top fertile soils in the Lake Chilwa basin. Another interesting aspect is that people prefer using soil from anthills for brick making because it is less sandy. But anthills are also used for planting crops like maize because they are considered to be fertile areas.

13.3.2 Gardening: vegetable production

Dry season gardening is another important economic activity that uses domestic water resources. In both urban and rural areas, people plant maize and a variety of vegetables for home consumption and for sale. In urban areas it is common to see gardens around houses of residents. Away from urban concentrations, people often use water from wells and boreholes for production of vegetables. Although water source committees do not allow the use of such kinds of water, some people still use them. Those that do so are the ones that have gardens close to the sources or have some disproportionate amount of influence in the area. This is the case with most dimba (stream bank garden) owners along the Likangala river.

Dry season cultivation is a major economic activity in the study area. It shapes social relations and helps in alleviating rural poverty in Malawi. There are hundreds of dimba gardens in the study area with differing sizes. Dimba cultivation is a widely adopted productive use of water in the informal sector that offers lasting opportunities for the improvement of living standards of peasant farmers in the country. However, despite the significant role that dimba cultivation plays in the rural economies, it is not recognized in the new water and irrigation policies.

13.3.3 Livestock watering

In general, Malawi does not have a big livestock industry. Compared to other countries in the southern African region such as Botswana or Zimbabwe, the population of livestock is relatively small and this means that demands for water are not high. But, given the scarcity of water in the Lake Chilwa area, access to water for livestock is often a source of conflict. The commonest animals kept are goats, cattle and chicken. In urban areas, there are some people who keep broilers and laying chickens for commercial purposes. These consume large quantities of water each day and they mostly use treated water for that purpose. In rural areas, livestock husbandry involves the use of the system of free-range. The livestock is left to stroll to water sources and as long as they do not damage the sources most people seem to have a lukewarm attitude. As noted earlier, Malawi recognizes the provision of water for livestock as a domestic activity.

13.3.4 Beer

Beer brewing is another major economic activity in the area that uses water. In particular, *kachasu* (a local gin) is commonly produced in the area. Women mostly undertake this activity. Although this is often done during the dry season and particularly after the harvest of the wet season crops, beer brewing and

drinking is an important social function. It is also an important means of earning income for those people who undertake it.

13.4 Conclusions

This paper has examined the use of domestic water for productive activities. Drawing on the research conducted in the Lake Chilwa area in southern Malawi, the paper has demonstrated that the traditional understanding of domestic water use does not always apply to water users in rural areas. What counts as domestic use is relative, even where minimum water requirements are not met, users venture into productive activities if only because that is seen as a possible way of generating income and getting out of poverty.

Although the provision of domestic water supplies must be encouraged, cognizance must be taken of the other potential uses which ultimately affect the supply and management of such water sources. Policy makers and water providers need to understand these various uses, which sometimes tend to supersede domestic considerations.

The provision of water facilities to rural people must be seen not only as a means of improving their health and sanitation conditions but also as a way of ultimately alleviating their poverty. Water plays a very important role in the social and economic activities of rural people in Africa. Driven by the need to improve their lives, people tend to use domestic water for productive purposes in ways that may not even be easily noticeable to observers.

This discussion should not be seen as just another case study with detailed factual information on water uses in Malawi. On the contrary, it goes beyond that discussion and raises key issues in understanding the different uses of water at the household level. Based on this study, therefore, the following conclusions and recommendations have been made in the hope that they shed some light on the relationship between domestic water use and poverty in developing countries.

- The key issue is not about whether people have adequate water supplies for domestic purposes or not; it is about livelihoods, that is, how to use water to alleviate their poverty.
- If poor people's access to water is decreased their opportunities for alleviating their poverty also diminishes.
- Poverty is neither new nor unique to Africa; what is new is the magnitude of the problem and the susceptibility of certain groups entrapped in poverty. Thus, the use of domestic water for productive purposes constitutes an important strategy by the poor people in both rural and urban areas to improve their lives.
- The dichotomy between domestic and non-domestic use of water makes sense in the context of provision of water facilities but it blurs up the creative adaptations that poor people make to earn a living. These categories are frozen in time and space in the sense that they do not allow for negotiations that frequently take place among the poor people.
- While economic benefits of productive uses of water can be easily quantified, social benefits are difficult to enumerate. Hence, measuring these benefits and the ways in which they help to alleviate poverty in developing countries must go beyond economic indicators like GNP to social indicators such as literacy rate, health and nutritional status.
- Studies of domestic uses of water supplies must incorporate issues of power relations in accessing such water resources. As this study has shown, although most water sources have committees, with rules and regulations restricting the use of domestic water for productive purposes, political and socio-economic factors influence how and why some individuals can use a scarce resource for productive purposes.

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13.6 References

Cleaver, F. (1995). 'Water as a Weapon: The History of Water Supply Development in Nkayi District, Zimbabwe' In *Environment and History* vol. 1, p. 313-33.

- Cleaver, F. (1998). *Choice, Complexity, and Change: Gendered Livelihoods and the Management of Water Agriculture and Human Values*.
- DeGabriele, J. (2002). *Improving Community-Based Management of Boreholes: A Case Study from Malawi*. Madison, WI, USA, BASIS Progress.
- Gleick, P. H. (2000). *The World's Water 2000-2001: The Biennial Report on Freshwater Resources. 1998-1999* California, USA, Island Press.
- GOM. (2001). *Lake Chilwa Wetland State of the Environment Report*, Lilongwe, Malawi Government Ministry of Natural Resources and Environmental Affairs.
- GOM. (1998). *State of the Environment Report for Malawi of 1998* Malawi Government Environmental Affairs Department.
- GOM. (1999). *Water Resources Management and Policy Strategies* Lilongwe, Malawi Government Ministry of Water Development.
- Illife, J. (1987). *The African Poor: A History*. New York, USA, Cambridge University Press.
- Kaluwa, P.W.R., Mtambo, F.M and Fachi, R. (1997). *The Country Situation Report on Water Resources in Malawi* Lilongwe, Malawi.
- Mulwafu, W.O. and Khaila, S.C. (2002). 'Conflicts over Water Use along the Likangala River in the Zomba District of Southern Malawi'. In Uledi-Kamanga, B.J and Kamwendo, G.H. (eds.) *Culture and Environment in Development*. Chancellor College Publications (forthcoming).
- Ohlsson, L. (1995). *Hydropolitics: Conflicts over Water as a Development Constraint*. London and Atlantic City, NJ, USA, Zed Publications.
- Peters, P. (1984). 'Struggles over Water, Struggles over Meaning: Cattle, Water and the State in Botswana' In *Africa*, vol. 54, no. 3, p. 29-48.