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**LOCAL ACTION WITH INTERNATIONAL COOPERATION TO IMPROVE AND  
SUSTAIN WATER, SANITATION AND HYGIENE SERVICES**

**Health, food security and equity, socio-economic  
factors in self-supply investment**

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**PAPER 2585**

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*International research into household investment in water supply and sanitation has led to a growing awareness of the significance of household investment (Self-supply) to the local WASH sector. This paper looks at some lessons learnt from baseline surveys of self-financed water supplies in Ethiopia, Malawi and Zambia. The surveys explored some impacts of on-plot Self-supply, which could influence future efforts to support self-supply services to reach new groups and improve existing supplies. The prime motivation for investors is convenience of domestic supply. A closer water source is perceived to improve family health and save time and energy, and so to lead to greater food security, even where the water is not directly used for productive purposes. In equity terms investment is not limited by wealth or education. Sharing of supplies extends many of the benefits of proximity of access to those who have been unable to develop their own.*

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## **Introduction**

The 2014 GLAAS report (GLAAS 2014) drew attention to the fact that 82% of African countries had insufficient finance to reach targets for drinking water, and that rural populations comprised 70% of the unserved but only got 19% of the funding. The same report indicated that 6-66% of financing for WASH came from households themselves. Much the same situation remains today. Whilst the SDG 6.1.1 looks to bring water 'close to the house' and to increase stakeholder participation, the reality for many people in small communities or widely scattered houses is a future where community water supply will either consist of a handpump of varying reliability at more than 500m from their home or no handpump at all. The latter will be the reality for more than 250 million rural dwellers of Sub-Saharan Africa in 2030 even if the peak rates of progress in the past 25 years can be consistently maintained for the next fifteen. (Sutton,2016). As Evans et al (2013) have shown for more conventional supplies, on-plot supplies tend to have positive benefits for households and this paper looks at the lessons learnt from a set of surveys of over 1000 traditional well-owners and well users in three countries (see Notes). These surveys were carried out from 2010-2015 as baselines or impact assessments in Ethiopia, Zambia, and Malawi. They include the factors that motivate people to develop their own solutions through Self-supply, and whether this is an approach for only the favoured few, or whether it offers equitable improved access, where other options continue to be limited or non-existent.

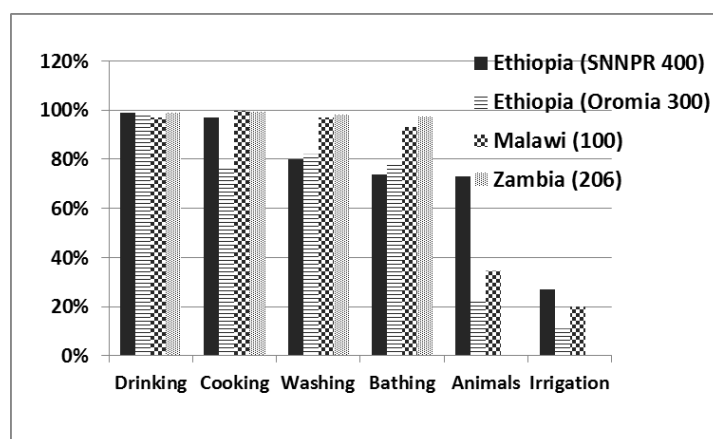
## **Motivating factors**

### **Satisfying domestic demand and/or increasing productivity?**

Promotion of household investment in water supply often assumes that a prime motive is that of enabling increased productivity in order to recoup the cost of the outlay being made. That is a logical reasoning amongst people who think in terms of cost benefits and productivity, but is less common amongst those for whom even producing more than they can eat is still a foreign notion or a far off dream. With dependence on rain-fed agriculture still the norm for livelihoods in sub-Saharan Africa, the main demand for water is still

for domestic purposes. It is a demand which has to be fulfilled every day, and creates a constant drain on the energies and time of members of the household (especially women).

Of over 1000 traditional family wells surveyed (e.g. Photograph 1), which are used at least in part for domestic purposes, at least two-thirds were constructed only for domestic uses (see Figure 1). In the case of Milenge district Zambia, one of the poorest districts of the country, with no tradition of keeping livestock or of small-scale irrigation, all investment in supplies had been purely through the wish to provide a supply for domestic purposes.



**Figure 1. Uses of water from traditional family wells**

Source: UNICEF 2010, RiPPLE 2011, PumpAid 2014, UNICEF 2015

However in a few cases this included a flower bed or small bed of vegetables for home consumption. The lack of equally convenient alternative sources, such as surface water or community supplies meant that the traditional Self-supply wells in the surveyed districts of Malawi and Zambia were used for all domestic purposes by almost everyone, even in the tobacco growing area of Kasungu, well-served with handpumps. In contrast, the availability of surface water sources for some of those in Ethiopia meant that for washing clothes and bathing it was easier to go to the stream and wash there rather than draw large quantities of water, especially if using a neighbour's well. There is however also a greater demand for water for irrigation (sometimes mechanised) in the areas with cash crops, and larger livestock population are also commonest in Ethiopia.

The apparent dominance of interest in supplying the household first, rather than employing the direct economic benefits of water, suggests that trying to combine increasing incomes through productive water use with convenience for domestic supply is a concept which may take time to introduce, despite its benefits being so clear to outsiders.

### **Convenience and associated factors**

In terms of the benefits that encouraged others to copy the wells that first trend-setters constructed, convenience and improved health were the highest ranked impact in all three countries. In the study of 400 traditional family wells in Zambia, perceived changes were further explored in 150 households to provide key messages for marketing. Reduced tiredness of water collectors and improved health of the family, especially children, were remarked on by almost all respondents (90-97%) (see Table 1).

This translates particularly into women having more time and energy to care for the household. Their extra time and energy arise partly because of shorter distance they have to walk to the supply, but also because more family members collect water when the supply is close by (increasing men's contribution to water collection). Also there is less need to carry the larger volumes of water needed for washing clothes and dishes and bathing because these can now be done beside the water source, close to the house where small children can be kept an eye on whilst the other tasks are undertaken. The high awareness of improved child health links onwards to higher attendance at school and even improved performance in class.

## SUTTON

A further dominant factor was the feeling that owning a well increases the owner's status in the community. This is not only because of being able to offer a free service to other community members, but also because a well is an easily visible tribute to his/her ability to organise major works and to provide exceptional care for the family.

Topic	Family perception	%	Rank	Women's view	%	Rank
Convenience	Less time taken on drawing water	75%	6	Less tiredness	91%	2
	Flexible collection times	69%	8	More time to care for household	79%	5
	Flexible uses	42%	13	Easier childcare	49%	12
	More family members collect water	39%	14	More time for farming	29%	18
	Reduced burden on women	38%	15			
	Children can draw water easily	34%	17			
	Increased safety	16%	19			
Health	Less illness	90%	3	Children's health improved	95%	1
	Improved personal hygiene	54%	10	School attendance increased	64%	9
				School performance enhanced	54%	10
Social	Improved status	80%	4	Decrease in social interaction	35%	16
Agriculture	No change	72%	7			
	Larger area of cultivation	15%	20			
	Different crops grown	14%	21			
	More animals	2%	23			
	Beer-making	4%	22			



**Photograph 1. Typical Ethiopian family well – an investment but with scope for further improvement**

Source: Sutton

### **Food security and livelihoods**

The surveys all asked well-owning respondents to visualise their way of life and economic situation in the years immediately before they constructed their well. After defining this situation they were asked to generalise on their situation in the past two years (or less) since construction. These were not years of exceptional rainfall. In all four survey areas, owning a family well appears at least to lead to a major perceived shift in food security when the water supply moves closer to home. In all cases the shift from 'not producing enough food for all the year' to 'producing enough food for all the year' was significant (see Table 2). In Zambia and Ethiopia the effects of more convenient supply led to near-disappearance of the category without adequate food all the year, whilst in Malawi the proportion in this category more than halved.

Household situation	Insufficient food for all the year		Sufficient for all the year		Excess for sale	
	Before	After	Before	After	Before	After
Ethiopia SNNPR	82%	1%	8%	76%	2%	5%
Malawi Kasungu	43%	18%	26%	47%	6%	27%
Zambia Milenge	78%	3%	11%	68%	0%	10%

Especially in Malawi, in the tobacco growing area, with established markets for produce, Self-supply speeds the move of families up the economic scale from subsistence to having surplus to sell and on into investing income back into the farm and water supply. However a residue of those not producing enough food for all the year remains, as the production of cash crops is their higher priority either because it allows them the choice of what food to buy in, or because they are still too much debt to the tobacco companies which 'tie them in' by providing credit for seeds and fertilisers. Smallest related changes in farming were recognised in Zambia, since farming is still largely rain-fed, but perceptions of increased food security may be not from using water directly, but through the greater available time and/or energy which can lead to improved yields and productivity even without changing the areas and crops cultivated.

In Ethiopia the impact on food security was significant although amongst those who were initially subsistence farmers only a few moved on to sell crops and even fewer to invest in their farm. However it appears that here, as in Zambia the main change in family fortune relates not so much to using the water for irrigation as to releasing time and energy for increased productivity. A comparison between households which used their well only for domestic purposes and those using it also for irrigation and/or animals, found significant improvement in levels of food security in both. However it should be borne in mind that these were families using only basic irrigation methods and amongst those who moved on to using diesel pumps the shift is greater.

As a whole the studies suggest that owning your own well has fundamental perceived positive effects which need further exploration and are at present largely ignored by the sector. As Evans et al (Evans 2013) have shown for more conventional supplies, reliable on-plot supplies tend to have greater positive benefits compared with shared public supplies. Similar quantitative research is needed for the multitude of traditional family wells comparing their impact with that of sharing a more distant handpump within a larger group. The very strong perception of families that having one's own supply benefits health is at odds with the dominant concern of sector professionals that water quality is of paramount importance. The impact of greater proximity of a reliable, (if only semi- or un-improved) supply on the well-being and productivity of women (main food producers) is also perceived as greatly improving food security, even without productive use of the water. This suggests that micro-finance agencies should not necessarily regard applicants wishing to construct or improve domestic supplies as a higher financial risk than those wanting to invest in supplies more obviously for productive uses.

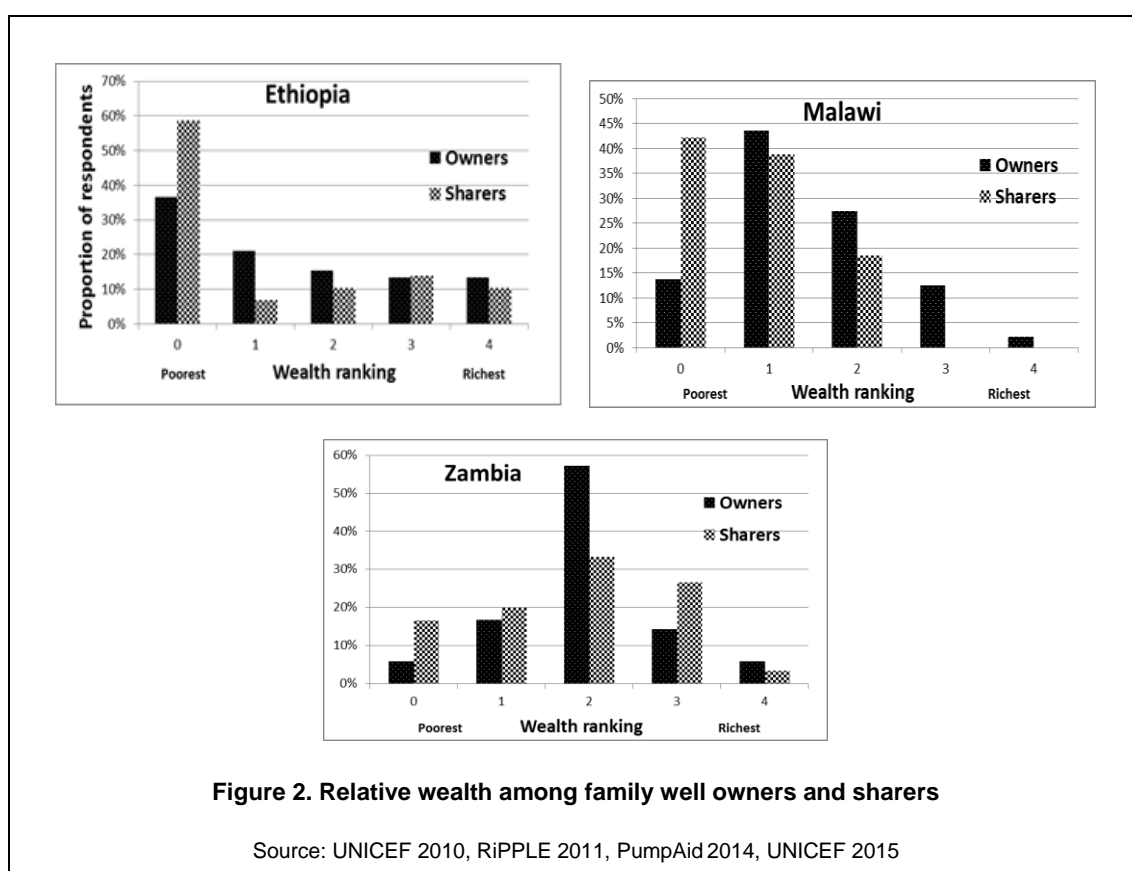
## **Equity issues**

### **Wealth**

If owning a well offers such fundamental benefits, it may be questioned whether such benefits are only available to better-off or better-educated families who have the cash to invest, or the knowledge to organise such a development. This may depend to some degree on the local rural economy and also the hydrogeology, and so the same targeting for marketing or subsidising the concept may not be relevant in each country or each part of a country. As more people realise that they can be pro-active in improving their access to water, not just getting on a list for a well 'sometime' with their local councillor, investment in household water supplies is growing. Rural economies are improving slowly, offering more families the opportunity to choose what to put money into, beyond the essentials of food, health and schooling.

Surveys on wealth ranking have been used to measure the degree to which the opportunity to invest capital in water supply is limited to the most wealthy. The surveys used different indicators in different regions depending on the five or more assets chosen by people in each area to signify different levels of

wealth. Some were chosen to be directly observable but some required information from the householder. Those owning all indicators would be regarded as being rich, those with none being amongst the poorer in society. Common indicators were house roof /floor type, and ownership of land, livestock , radio, television, or bicycle. Figure 2 shows that in the case of Ethiopia over 50% of well owners were in the two lowest quintiles, with over a third possessing none of the indicators of wealth. In Malawi and Zambia most well-owners fell in the middle quintiles of asset ownership, and in no survey does it appear that only the wealthiest are able to invest in having their own supply. This method of indicating wealth is simple but does not make it possible to compare with the proportion of people in the general population falling into each category. It may be surmised that the probability of having one’s own supply is higher in the higher quintiles of wealth (which have fewer members). However the data does show that most well-owners are not in the richest categories and that being in a lower category does not make it impossible to be well-owning. It is also slightly a question of chicken and egg as far as wealth is concerned. For those who fall in the wealthier quintiles, did it make it possible for them to construct a well, or did the well help them to climb into a wealthier bracket? Only monitoring over time would make it possible to answer this question.



Comparison between owners and sharers does show that the latter on average do tend to be slightly poorer than owners, and in particular those in the lowest quintile are more likely to be sharers than owners. This suggests that opportunity is not exactly equal for all, but at the same time almost all owners share their supply with neighbours, who are without their own supply (90% of supplies shared in most areas). Culturally it is difficult, if not impossible to ask a neighbour to pay for what is regarded as a common good. Making money out of selling water is almost completely confined to urban and peri-urban settings where there is a) another nearby public supplies regularly charging for water or b) expense incurred by the owner pumping water. Sharing appears therefore an effective way to bring free water closer to home for those more vulnerable and less able to provide water for themselves, and to spread the associated benefits to rich and poor alike. In the survey areas, wells shared with neighbours formed the vast majority, and the number sharing depends largely on the density of population and availability of alternative sources. Average user numbers range from 80-90 in water short, more densely populated rural areas of Ethiopia and Malawi, to 50-60 where groundwater is easily accessible and more houses have their own supply. In Milenge district the

lower proportion (78%) sharing and average user numbers of 54 arise mainly because nearest neighbours are widely scattered and may be closer to another supply or have their own well. In Oromia, the highest numbers sharing (average 150) are amongst those who have motorised pumps, to which neighbours like to come because of the better quality (actual and perceived) of the water, even if they have their own open well. Thus those who have invested more may share the added benefit with those who have invested less or nothing in a supply.

### Level of education (see Figures 3 & 4)

Level of education may also affect the probability that a family will be able to construct their own supply, and for this comparable data at the national level for population are also available. It would appear that in all three countries the majority of well-owners are illiterate or with primary education only. In Malawi the distribution of well owners and of sharers roughly follows that for the national distribution of adults who are illiterate or for the majority who have primary or secondary education. However illiterates are slightly more common in the area of the survey than in the country as a whole. In Zambia and Ethiopia those with primary education are the most numerous in well ownership, but, in contrast with Malawi, those with further education are over-represented in their investment in water supply. This is most marked in Zambia and may here be due to the inclusion of a significant number of peri-urban households in small rural towns who were traders or civil servants, and who proportionally exceed the national average. This is also reflected in the number of 'sharers' in this category. Overall it would appear that lack of education is not a barrier to developing Self-supply, but that a low level of education increases the chance that a family will feel able to develop a supply. Those with higher education, as with those with greater wealth, may invest in their own supply more often within their peer group, but remain a relatively small proportion of those who practice Self-supply. Thus wealth and education are not pre-requisites to Self-supply, and more may depend on motivation and knowledge of options.

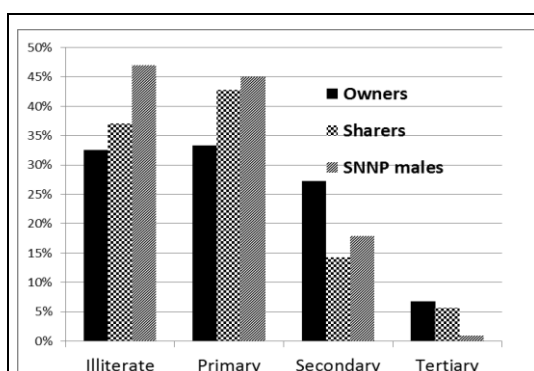


Figure 3. Education levels, SNNPR, Ethiopia

Source Survey data + Ethiopia DHS 2005

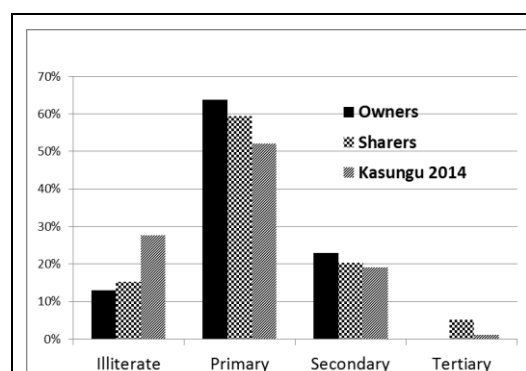


Figure 4. Education levels Kasungu Malawi

Source Survey data + NSO 2014

### Lessons learnt

- The perception of well-owners and sharers alike is that having your own well changes quality of life in many ways. The biggest change is having water 'on the doorstep' and so relates mainly to domestic issues, which particularly transforms the life of women in the household, but has many knock-on effects for the well-being of the whole household.
- Despite there being no guarantee that the water is 'safe', the high degree to which such a close well is felt to improve health for all the family, but especially children is another important driver for families to consider having their own well. It is a dilemma that at present with all policy emphasis on the quality of water, the apparent health benefits of having any water supply close to the home remains largely anecdotal and unproven in empirical terms, (despite the efforts of Evans et al 2013) and so more distant community supplies remain the only option promoted.
- The qualitative data collected suggests that a family well brings big changes to household economies whether productive use of water is included or not. Investment in domestic water supply should therefore

perhaps be regarded, by micro-finance institutions and others, as bringing an indirect economic return through the effects of time/ energy saving and health benefits even if there is no productive use of the water itself.

- The above advantages for households are not limited to the wealthiest or the best educated. Although members of such groups, forming a small proportion of the rural population, are slightly more likely within their group to take the opportunity to provide their own water supply than those in poorer groups, numerically it is the poorer and less educated groups amongst which most well-owners fall. Lack of motivation rather than of wealth or education seems to be a greater constraining factor.
- The culture of water being for the common good, and so to be shared means that Self-supply offers free access to water closer to home for many more disadvantaged households.

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## Notes

- Raw Data from UNICEF 2010 Baseline study Oromia, Ethiopia For details (Arma Engineering 2010).
- Raw data from RiPPLE 2011. SNNPR Ethiopia. For details (Sutton et al 2011).
- Raw data from Pump Aid baseline survey 2014, Kasungu District Malawi. For details (PumpAid 2015).
- Raw data from UNICEF survey 2015 Review Study Luapula Zambia. For details (SKAT 2015).

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