Multiple Use Water Services: Potentials and Challenges for Rural and Peri-urban Dwellers

Summary of the e-discussion held from 28th April to 23rd May 2014

Background

The RWSN (Rural Water Supply Network) Forum in Uganda in 2011 resulted in a commitment on progressing towards sustainable rural water supply services (RWSN, 2011). That commitment acknowledges that water is accessed for multiple uses such as drinking, cooking, washing, sanitation, watering animals, growing food and generating income. Over the past decade or so, an approach known as Multiple Use Services (MUS) has been developed. It seeks to ensure that people have all the water they need for healthy, productive lives.

Recognising the importance of these multiple uses and livelihood benefits is one thing but what does this mean in practice? How can equitable access to water within a community be ensured? How can water for multiple uses be provided in a sustainable manner? Should household investments be promoted? These are some of the issues faced by RWSN members, who are also finding innovative solutions. The Multiple Use Services (MUS) Group is a network of practitioners with experiences in these issues.

In order to share practices and promote cross-learning, an e-discussion was held focusing on MUS from the 28th April to 23rd May 2014.

Overall aim of the e-discussion

The e-discussion aimed to:

- Improve understanding among water practitioners of the MUS approach and explore how it links with issues of interest to RWSN: household investments in self-supply for multiple uses, equity considerations in multiple uses and the relation between multiple uses of water and sustainable services.
- Bring together a network of practitioners from different disciplines to share learning from approaches that have worked or have not.
- Unlock practical experience and capture in a synthesis. The synthesis will outline current knowledge gaps, policy implications, and highlight issues for the four RWSN thematic groups to take forward.
- Identify immediate and longer term actions for the MUS group and RWSN members.

Methodology

Members of all four RWSN thematic group lists were invited to participate, alongside the members of the MUS group. During the four weeks, the participants were asked to share their experiences, opinions and ideas, around four sets of questions for each week (see Annex 2):

- Week 1: Practical examples of MUS
- Week 2: The linkages between MUS and Self Supply
- Week 3: MUS and Equity
- Week 4: MUS and sustainability

Active members of the MUS Group and RWSN jointly moderated each of the weeks, and produced a summary, setting out the key points from the discussions (e.g. findings, highlights, gaps). This synthesis report was collated from the weekly summaries, adding references to further reading and providing background on each of the sub-topics. It ends with a reflection on the way forward, as discussed during the MUS Group meeting on 5-6 June 2014, and expanded upon by the moderators of the e-discussion.

The report is broadly structured along the topics of the four weeks although in practice some of the discussion on the topics happened outside this timeframe.

Participants

The e-discussion started off with 458 registered participants from 68 countries, with several new people joining in over the course of the weeks. In total 223 messages were posted to the group, which was continued even after the discussion had formally ended by over 80 participants. A list of contributors and the countries they reported on is included in Annex 1.

Multiple Use Services (MUS)

People in rural and peri-urban areas need water for drinking, cooking, washing, sanitation, watering animals, growing food and generating income. Most water projects only meet part of these – focusing on either domestic or productive needs. A multiple-use services (MUS) approach is broadly defined as meeting people's domestic and productive needs in an integrated manner while making the most efficient use of water resources (Van Koppen et al., 2009). Further information on the background can be found in a briefing note by MUS Group (2013) and this animated video.

Practical examples of MUS

Technologies

Participants in the e-discussion shared a wealth of technologies that are being used to fulfill both domestic and productive water requirements, i.e.

- Shallow wells
- Deep wells
- Handpumps (various types include Canzee, rope pumps, treadle pumps, EMAS)
- Small motorized pumps
- Piped water supplies, pumped and gravity-fed
- Household treatment systems, including chlorine dispensers and household filters
- Centralised treatment systems, sand filters
- Water rams
- Sand dams
- Irrigation canals
- Small tank systems and ponds
- Drip irrigation
- Hippo water-rollers
- Micro-hydro systems
- Cattle troughs
- Roof water harvesting tanks
- Road-river crossings

These technologies are well known and none are special MUS technology. Neither is there a specific preferred technology for MUS. As the team on the iWASH programme in Tanzania put it "we are agnostic to technology. Most of the well-known water technologies can be used, depending on a range of factors". When it comes to MUS, the main issue is making smart combinations of technologies, for example combining household treatment with piped or canal systems, or adding cattle troughs to a piped drinking water system.

One technology option that was discussed in depth in terms of its relevance for multiple uses is rainwater harvesting (RWH). This may be the only option for people without access to piped, boreholes or gravity water, or it is used to supplement other sources (Johnnie Wasswa, Uganda; Walter Mgina, Tanzania; and Robert Meerman, Netherlands). The amount of water obtained from a RWH system may not always provide all the water required. Participants of the e-discussion requested more easy-to-use-information to help practitioners in decision making on RWH. Suggested resources by the participants included Neal (2012), with further information on sand dams and the Rainwater Wiki (2014) with information on the 3R concept (retain, reuse, recharge).

Carmen Pong provided us with an overview on the scope of technology used in Central America: in small towns community gravity schemes or community handpumps are common, but due to limits of quantity and cost, this water is for drinking only and not for production. In Nicaragua households have household water supplies, as there are no piped supplies. People use these household sources for multiple uses.

Quality of technology and construction needs to be ensured so that investments by households or others are actually cost-effective. Low cost technologies should not mean poor quality (Henk Holtslag, Netherlands). Householders could be trained so that they should be able to do repairs, operation and maintenance themselves and with local resources (Bekele Abaire, Ethiopia).

Service levels: water quality and reliability

In the contributions, references were made to the service levels provided through these technologies. Several participants questioned whether the provision of water for multiple use comes at the expense of water quality, and reduces the expected health benefits. Whereas there may be some risks, research from Ethiopia also showed that conventional water supplies are not necessarily always providing better water quality. It was found that water from a sample of household wells pumped with electric pumps and producing water for irrigation had better quality than water from communal handpumps (Sutton et al., 2012). Household water treatment was seen as a way to off-set concerns where source quality is bad. More aspects need to be factored in an assessment for a more comprehensive view and risk assessment including sanitary issues. These more comprehensive risk assessments are also required in water safety plans.

Also reliability of supplies was mentioned. Paul van Beers questioned whether we can consider multiple uses of water when we still face the big functionality drama, particularly around hand pumps.

How were systems developed for multiple uses?

Several contributions referred to cases of 'de facto multiple use' whereby a system was originally developed for drinking water only, but then gets used for others uses as well, often positively. For example, villages in Rajasthan (India) started developing thanks to their access to a drinking water system which was also used for dairy production (Alka Awasthi, India). Likewise, Paul Kimera (Uganda) mentioned how rainwater harvesting facilities led people to undertake other productive activities. In Madagascar, Odile Michèle Randriamananjara highlighted experiences in developing domestic sources that produce a small excess that is used for small scale production (vegetable gardens or fish) or where the Water Users Association requested an irrigation dam to be used for both productive and domestic use. Examples from Latin America (Stef Smits) show that the situation is not static, as the livelihoods of people evolve.

Paul van Beers' suggested differentiating between two types of projects: rural agricultural projects (RAP), originally targeted at providing food security, and the rural drinking water supply projects (RWP), originally focused on providing drinking water. RAP projects generally generate income which might be invested in operation and maintenance whereas the RWP have no income generation component, so the funding of O&M might be more critical in the RWP set up. Such multiple uses can be planned and designed. The MUS group calls these angles irrigation+ and domestic+ when add-ons are designed either to irrigation (where you add on some domestic or livestock provision) or to domestic systems (where you design add-ons for some irrigation or livestock provision).

The spontaneous development of multiple uses is in some cases to the detriment of water supply systems, as Krischan Makowka reported from experiences with gravity-fed systems in Nepal. Also at regulatory level, problems

were reported with the de facto multiple use; Inés Restrepo for example mentioned that many of the national government regulations only allow a single use to be catered for in water supply systems, with design norms that are not conducive to multiple uses. Another risk of MUS may be that the hardware and software are over-taxed by unplanned uses, for example by pastoralists.

Several persons contributed examples of how these kinds of problems were anticipated by considering multiple uses from the outset. In Nepal, overflow from tanks was used to ensure a priority for domestic supply, whilst also accommodating some measure of small-scale irrigation (Krischan Makowka). Pamela White, referring to another case from Nepal, added that tariff measures and local rules around water use then also become part of the system development to ensure equity in access to water.

The iWASH team in Tanzania have developed a structured planning approach for multiple use services, starting with an assessment of actual water uses and needs (called water accounting) and using those for planning. However, in this case, there are limits to the extent that multiple uses can be planned. Once people have better access to water, they realise its importance and their water requirements rise. Increased access to water has also led to in-migration of pastoralists (Krischan Makowka, Uganda). This can be partially off-set by community-level integrated planning, which, at its turn, requires sufficient funding with enabling funding earmarks from donors.

Where irrigation systems end up being used for domestic uses, water quality risks may occur. Mr Mughal highlighted examples from rural Pakistan where people draw water out of big irrigation channels. Due to the poor financial capacities of these rural dwellers and the unaffordability of many technologies they end up using this water of poor quality.

There were also references to cases of traditional water management systems that were developed by users for multiple use. K. Palanisami referred to the small tank systems in India which always had several purposes, with the amounts used for different purposes changed over time. Peter Morgan from Zimbabwe added also shallow family wells as an example of traditional practice of multiple use of water – a practice that now also extends to communal boreholes according to Innocent Shoshore (Zimbabwe).

A question was raised as to whether MUS is only a rural issue, or whether the approach also applies in urban areas. In the answers to this question, it was indicated that it is also relevant in peri-urban and urban areas, for example for where urban agriculture is practised. In such settings, regulation and use of wastewater becomes more important.

Benefits to users

The perceived benefits of water systems that fulfil multiple uses to users are health (through access to safe water and better nutrition), year-round production (from cattle rearing, poultry projects and vegetable gardens), and livelihood benefits, such as water for bricks for house construction and energy generation through micro-hydros in the mountains of Nepal. Innocent Shoshore from Zimbabwe mentioned that the monetary value of the production from communal gardens is limited with production being mainly for the local market. But the benefits to home consumption include nutrition. This is also the main objective of the MUS programme reported by Muhammad Alrai from Ethiopia, in which improving nutrition is actually a main formal programme objective.

However, little data were shared to quantify these benefits. One of the exceptions was Henk Holtslag, claiming that in Nicaragua the benefits of installing a rope pump of about 80-120 US$ are worth about 200 US$ per year. More quantitative data on cost-benefit analysis of MUS can be found in Renwick et al., 2007.

The linkages between MUS and Self-supply

User investments for improving own water supplies (i.e. Self-supply) were reported by many participants, amongst others Carmen Pong (Central America), Henk Holtslag (Nicaragua, Tanzania), Hlan Myan (Myanmar) and Kerstin Danert (Chad, Niger and Nigeria). In these examples, the Self-supply sources are often used for both domestic and productive uses. In Latin America, investing in own water supplies is for many households about improving convenience, food security and generating some income. In many cases, like those described in the input from Mr. Obare from Yala Town in Kenya, the conventional public schemes are not reliable or not working at all. And even if piped systems or communal handpumps are working these services are often just not affordable for the poorest part of the population. As a consequence they have to get water from other sources (World Bank, 2013). In this situation today and in the past, investing in own sources is just a matter of survival.

As highlighted by Paul van Beers, interventions in Self-supply are not free but need considerable upfront investment, including for community mobilization and promotion. The example shared by Nik Holbro from Tanzania shows how software support led to the establishment of lasting supply chains which rely fully on payments of clients.

Self-supply is not a silver bullet – but in many contexts Self-supply for multiple uses provides a well appreciated upgrade in the level of service, an opportunity to improve livelihoods or just the only source to get water. Multiple uses make the related O&M more affordable as well.

Experiences in triggering domestic water through productive water development

Several very interesting experiences were shared where productive water interventions triggered improvements in domestic water supply. Mainly this was through using water for from the same sources. Kerstin Danert highlighted the fact that in Niger farmers who started drilling wells using manual drilling techniques intending to use water mainly for productive uses often ended up using the water for drinking as well. The same drilling technique was used in other areas only for drinking water supply e.g. from Nigeria to Chad (Danert, 2006). These technologies used for Self-supply have spread across countries over the years through a market based approach.

MUS and Equity

Equity at community level

At community level, social relations are hierarchical, and this also affects water allocation, as F.H. Mughal (Pakistan) said. Water flows to where the power is, the male elite, and that deprives the marginalized even from water for domestic uses. The contributors mentioned a range of local contexts, hierarchies, livelihood strategies, and changes overtime. They highlighted the extent of informal water uses (for Self-supply) at community level, and also how water conflicts are between people, each with multiple water needs, but with different powers.

Women at community level do address these hierarchies and improve water management. Nozila Makhomedova described the profound changes in the areas with large-scale irrigation canals in Central Asia after the dissolution of the top-down water allocations by the Soviet Union. The new farms and continuing population growth led to the emergence of many scattered small farms in which homestead irrigation became a vital livelihood strategy, especially for women (men migrate). The top-down irrigation managers, dominated by men had ignored women's domestic and productive uses. In response some women took the initiative to manage water and solve conflicts themselves at community level.

Other areas are exceptional and risk being ignored altogether, such as the mangroves in Cameroon. Fishing is the mainstay, also for women who process the fish. Access to safe drinking water is a problem for everybody (Dr Ahanda Sothène Nicaise).

Equity at intermediate level

The 'intermediate' level refers to the level where governments and NGOs organize service provision to communities. The contributions showed the huge variation in equity, from the one extreme where service providers exacerbated hierarchies; to various forms of more equitable conflict resolution; to inclusive planning and pro-active redress of gender and other hierarchies considering all peoples' water needs.

At the one extreme, hierarchies can be exacerbated because of the elite capture of water resources, often the male elite or landlords who find their ways to government officials. Or when managers of the large-scale irrigated areas in Central Asia kept prioritizing government crops, and ignored the growing water needs of women cultivating their priority crops at homesteads (Nozila Makhomedova).

However, other contributors showed a more positive role of government and NGOs in water allocation. K.P. Palinasami explained how norms exist for sharing water in tanks in India. For example, a portion of the water is used for revenue generation (e.g. through forestry or fisheries) Line agencies regulate use of large tanks and the local government regulates use of small tanks. A portion of the water is kept for fishery by landless fishermen and as irrigation storage which benefits the farming community comprising of small and marginal farmers. Such norms guide the meetings between leaders of tank-based Water User Associations or the local government and government line agencies' officials.

Tidiane Diallo (Mali) described how the title holders of the land inundated by a new multi-purpose dam unexpectedly claimed compensation. The local officials facilitated a solution. This shows how important it is to consider costs and benefits of different groups in advance and have agreements on paper. Another case in Mali showed the importance of targeted support to marginalized groups. WaterAid supported peri-urban water supplies that changed local organization and increased land values. Capacity building of women has led to women's full involvement in water provision, access to microcredit, and soap production. However, women are still under-represented in decision-making, and in the use of the revenue generated. WaterAid and partners also target blind people, ensuring wells are also accessible and safe for them for productive as well as domestic use.

WaterAid in Mali and Burkina Faso also assist communities to monitor fluctuating groundwater tables. This information helps them to prioritise uses when water gets scarcer.

Pamela White shared how the Rural Village Water Resource Management Project in Nepal pro-actively and intensively seeks to redress gender and caste hierarchies. Equity is enshrined in the planning and capacity building for Water Use Master Plans, Village Plans, and Water Safety plans. It includes measuring of all water sources (up to 3000 per district). The project prioritizes domestic water uses but also stimulates productive water uses. Women are prepared and encouraged to speak up in large meetings. Instead of creating conflicts, the experience of working together on a common WASH project has appeared to be a positive way to heal wounds of the earlier civil war. Water allocation for new schemes is complex, though. This is done through legal registration of new schemes with local government. However, the original owners sometimes lose out and corruption occurs in this process. Also, water provision to 'illegal' settlements is now forbidden.

In Honduras, a fully-fledged MUS planning process was based on livelihood-related water demands. As Stef Smits found, the strongest needs appeared amongst small-scale farmers, and not the poorest who lacked the assets to use much water. A solution to ensure that water allocation meets basic supplies for all is to encourage wealthier users to invest in their own private water supplies. Also, payment should be proportionate to volumes used. Such planning processes require lots of time and facilitation skills, and it is doubtful whether all programmes have that time and skills available.

Equity at national and international level

Some consensus came up around the question: do we have short, sharp messages for decision-makers and other water-use sectors about what needs to change to facilitate the scaling up of equitable MUS best-practice? What are the policy changes we want to see? How can we ensure the policy informs design (Sekuma Simon Peter)? And what are some of the forums we could use to expand our influence? (Louise Whiting)

a) For domestic water uses, there is a human right, and national water laws usually prioritise domestic uses as well. Nevertheless, existing provisions for equity may not be implemented and policy makers may still ignore poor people ('they will not pay for the service', 'economic uses are most important'). So a key message is: 'approaching the government offices with large-scale mass awareness, involving foreign NGOs and institutions' (F. H. Mughal), in order to strengthen institutions so existing policies are actually implemented on the ground.

b) For productive uses, policies and laws are biased against small-scale users. There is no public responsibility to support services for everybody's small-scale productive uses; public subsidies for infrastructure development often end up with those who already have land, access to markets, money to invest in larger fishing equipment (Barbara van Koppen). Water is not adequately recognised in the human rights to food, gender equality of non-discrimination.

c) Statutory law (permit systems in Latin America and Africa, but also in Nepal and elsewhere in Asia) are needed to regulate the few large-scale users, for example, avoiding land and water grabs. However, the current administrative permit system discriminates in various ways against the poor, especially women (Barbara van Koppen).

d) Throughout the general administrative structures of the water sector and human rights bodies, the real water allocation issues are mystified. Sectors are pitched against each-other; for example all domestic water uses against all agricultural uses. However, the conflict is NOT between competing water uses/sectors, but between people (gender, power, politics) competing for water for multiple uses.

MUS and Sustainability

Financial sustainability

Several contributions suggested that multiple uses of water contribute to water service sustainability.

It was argued that having access to water for multiple uses increases people's willingness and ability to pay. Cash flow from productive uses of water can be used for financing maintenance, ensuring quick repairs. This was referred to by Paul van Beers as the 'chicken spin-off effect' (referring to people using water to keep chickens and making money selling the eggs etc), which is likely to be strongest when reliable water services are provided close to people's homes. However, the benefits of paying for water in order to use it for multiple uses have to be clear for users and may need to be demonstrated through (pilot) projects.

An example of a successful though unintentional pilot from Cyprus (William Turner) was where farmers were initially reluctant to pay for water from a government water supply scheme until a private company demonstrated that high profits could be generated by buying water from the government and using it for banana cultivation. The practice caught on and was taken to scale by local farmers.

Willingness to pay for water and O&M varies a lot between communities, and even within communities, especially where multiple sources are available for multiple uses. This was illustrated by Sean Furey with an example from the Ferghana Valley in Tajikistan where people with access to both (safe) piped water and (unsafe) irrigation water use the latter for domestic purposes, instead of using and paying for safer, but more expensive piped water supply. Similarly safe piped water was used for irrigation when irrigation channels ran dry. It has taken a lot of time and effort to increase understanding, demand and willingness to pay for safer water supplies in that case.

Alexander Aponte highlighted that whilst revenue generation is possible when meeting all community water needs using a MUS approach, it falls short of the levels required to maintain, manage and upgrade water supply systems. Ralph Hall cited research from Senegal adding that multiple use systems could just about pay for themselves if all of the income earned from productive water use were used to pay for O&M and capital upgrade costs. It showed that it was, in theory, possible to recuperate all of the incremental O&M costs and possibly a significant amount of the incremental capital upgrade costs (say over a ten year period) if the political will existed to design for multiple uses.

A contribution by Rakotoarisoa Tiana Zo Andrianina from Madagascar highlighted disparities in tariff mechanisms between rural and urban environments saying that greater revenue generating opportunities existed for scheme operators in urban environments with more coherent tariff mechanisms. Assuming that communities are aware of the economic potential of MUS and that there is sufficient water for productive and domestic use, he identified four drivers for community investment:

- Awareness of the potential of water and that access is a human right
- Financial and technical support for appropriate technologies
- Budget support from the public water sector– even if it is not enough on its own
- Access to credit or microfinance

His recommendation is to drop community management and to adopt a management system with private pricing of water volume (volumetric system) and to propose different services with different pricing for social or shared terminals, individual connections, etc. Households then negotiate their preferred domestic and productive uses using credit from micro-finance, if necessary, to cover cost of connections.

Technical and managerial sustainability

The importance of planning for multiple uses at the outset of scheme design was highlighted by a number of contributors. Unplanned multiple use of water supply systems was cited as being responsible for conflict between users and a decline in the technical performance amongst others in Honduras (Stef Smits), Senegal (Ralph Hall), and Uzbekistan (Nozila Makhomedova).

Where MUS had been planned for and systems were designed appropriately there was evidence for piped water supply (from Senegal by Ralph Hall) that technical performance was positively associated with greater levels of productive use. It was not clear however if enhanced technical performance was caused by people's higher stakes in more productive water uses or if productive uses were triggered by enhanced technical performance of water supply systems.

Guidelines for planning for MUS mentioned during the e-discussion included the one developed in Tanzania, and the MUS Group Guidelines for Planning and Providing MUS (Adank et al., 2012).

Planning for MUS will improve chances of sustainability but is not sufficient on its own to guarantee it. Other sustainability considerations raised in the e-discussions included:

- Involvement of users during planning and implementation of new water schemes
- Training of users and service providers
- Private sector involvement is useful for investments and ensuring professional service provision
- Good record keeping, and regular open meetings between the operators and the water users
- Elimination of corruption
- Post construction support from trained and well equipped institutions with MUS insight

Scaling up of MUS could be achieved through the WASH and irrigation sub-sectors and also by strengthening the water component of the more general participatory and decentralized planning approaches outside the water sector. When communities prioritise water interventions in these approaches, they are often for multi-purpose infrastructure for multiple uses from multiple sources.

In this, the role of the government was highlighted, raised amongst others by Niklas Holbro who has experience of MUS including drinking water, other domestic uses, family gardens, and cattle troughs stations for pastoralists. The government plays a critical role in contracting service delivery to local providers, subsidising services where required, and also in developing local capacity for maintenance.

Water resources sustainability

All multiple use schemes need sufficient water resources to meet water needs. Water availability and quality change within and over the years. There were examples of systems that function on fixed allocations for productive water use (a certain quota per person or household per day) that simply switched off when water ran out.

In fact some argue that one of the benefits of MUS is improved performance of the systems through water resource sustainability. For example, in the iWASH programme in Tanzania an environmental protection group established itself to get access to the water sources. Several contributors, including Jean Paul Niyubhawe from Burundi, therefore also called upon us to develop MUS within a framework of community-level integrated water resources management. Another benefit of an integrated consideration of water resources is waste water re-use.

There were a few examples of active monitoring of water resources to inform allocations and changes in response to changing water availability to avoid system shutdown and to regulate use. An example of such an approach (Community Based Water Resources Management) was shared from Burkina Faso (Lucien Damiba) where users monitor rainfall and groundwater levels on an ongoing basis to inform development of operating principles governing water allocation and use.

The spectre of mass groundwater depletion was raised in an example from India which described the negative side effects of the green revolution, asking if the same thing could happen elsewhere (Kerstin Danert asked whether we are seeing the signs of it in Nigeria) as productive water use is further developed. The conditions that led to uncontrolled abstraction in India (poor service delivery from public water systems, farmers turning to develop their own supplies, rural electrification, affordable pump technologies, groundwater ownership tied to land ownership rather than separately allocated) are certainly present elsewhere, coupled with weak regulation of abstraction. Emerging community based allocation systems will be crucial for all water users to self-regulate. This has proven difficult in the past without intervention from higher authorities.

Conclusions and next steps

Looking back at these rich contributions to the e-conference, and at the summarising debate held during the MUS Group meeting hosted by WaterAid, London, 5-6 June, the following points emerged as overall conclusions.

- The e-discussion showed the widespread practice of people's multiple uses of water. The network of the 400 participants generated many new cases from countries that so far hadn't been included in the MUS Group documentation repository (http://www.musgroup.net).

- MUS doesn't require any special technologies. All cases report the use of well-known water technologies, but so that they are that allow them to be used for multiple purposes (e.g. because of higher capacity), or through smart combinations of these technologies.
- The two risks of a multiple-use services approach that were mentioned mostly are water quality and over-use. Potential solutions are available. For example, the safeguarding of water quality for drinking can be undertaken by combining treatment technologies or better protecting water sources. Over-use can be anticipated by designing water systems based on water needs for expected livelihoods activities. This means that multiple uses need to be planned for in a systematic way from the outset.
- However, livelihoods are dynamic, and it appears that people who get used to having more water, sometimes will want to use even more. This means that not all water needs can be anticipated.

Self-supply

- Own investments in water technologies for self-supply are usually for multiple uses. They may actually be the only option for those excluded from public services, or the preferred option for those who can pay.

Equity

- Those with more assets (land, cattle, etc) tend to use more water for productive uses. By considering all uses, MUS unravels the underpinning social hierarchies. For the poorest of the poor, systems for multiple use are relevant as these are often the only source of water they have in the first place.
- Homestead-based MUS (or 'domestic+) is especially relevant for women and girls, who need a nearby water source for domestic purposes, but also engage in productive uses which is often small scale and informal. For the landless, the homestead is the only site to use water productively. Both are often ignored by both drinking water supply systems, and supplies for agriculture.
- The planning of public services by intermediate-level agencies can either reinforce local hierarchies, or target and include the marginalized in participatory planning to overcome existing social differentiation. But, more tools are needed to tackle equity more explicitly.

Sustainability

- The link between financial sustainability and multiple uses remains a chicken and egg one. More revenue is created through MUS, at a positive cost-benefit ratio (Renwick, 2007), but this is not necessarily reinvested in the system.
- Still, many experiences do not systematically report the costs and benefits. In that sense it would be good to have standard tools to collect incremental cost and benefit information.
- MUS can contribute to environmental sustainability. Cases were reported in which communities monitor groundwater levels for better water resource allocation.

The e-conference provided a whole new set of cases (Table 1) on multiple-use. Moreover, the e-conference brought together groups of professionals (from the WASH and irrigation sectors; from the RWSN and MUS Group communities) who may not always be in contact with each other.

There is need to better capture the evidence of the benefits of multiple use services and experiences of implementing such an approach and maintain the contacts of the different groups of professionals; and to do so together, as this e-conference has been very fruitful. In order to do so, we will:

- Invite contributors to submit their full experiences – in the form of project reports, papers or otherwise - to the MUS Group repository. We recognize that a contribution to an e-discussion necessarily needs to be short, and that many of the contributors may have more detailed analyses of their experiences available. Those who have experiences in the form of consolidated outputs, will be invited to submit their cases to the MUS Group, where they are then part of the biggest – to our knowledge – repository of documents around MUS.
- Maintain the existing D-Group, as an online platform to which the members can keep on submitting new cases, ask for advice from peers, or discuss new insights around multiple-use services. RWSN and the MUS Group will need to discuss how the D-Group will be moderated..

- Both within the MUS Group and RWSN communities focus on those issues that remain knowledge gaps or areas where more work is needed, especially:
  - Approaches and tools to safeguard water safety
  - Approaches and tools for planning MUS in a systematic manner, and particularly linking to local water resources management
  - Approaches and tools for addressing equity
  - Encourage research on the linkages between financial sustainability of services and the revenues generated through use of water for multiple purposes, including cost-benefit analyses

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Annex 1: Contributors

Name	Country of reported experience
A. P. Killabuko	Tanzania
Adam Harvey	Uganda
Alan Malina	Mozambique
Alexander Aponte	Colombia
Alexander Eaton	United States of America
Alka Awasthi	India
André Olschewski	Various countries
Arthur William Okero Obare	Kenya
Barbara van Koppen	Various countries
Bekele Abaire	Ehtiopia
Carmen da Silva Wells	
Carmen Pong	Various countries in Latin America
Edith Veromaminiaina	Madagascar
F H Mughal	Pakistan
Francis Saidane	South Africa
Francisco Palma Saidane	Mozambique
Grant Gibbs	South Africa
Henk Alberts	Nicaragua
Henk de Haan	The Netherlands
Henk Holtslag	Various countries
Hla Myan	Myanmar
Ian Neal	Kenya
Indira Shakya	Nepal
Ines Restrepo-Tarquino	Colombia
Innocent Shoshore	Zimbabwe
Jean Paul Niyubahwe	Burundi
John Butterworth	Zimbabwe, Ethiopia
Johnnie Wasswa	Uganda
Jules Sow	Burkina Faso
K.Palanisami	India
Kerstin Danert	Various countries
Krischan Makowka	Uganda, Nepal
Kuppannan Palanisami	Pakistan
Lahai Ensah Bunduka	Sierra Leone
Léandre Appom	Togo
Louisa Gosling	United Kingdom
Louise Whiting	United Kingdom
Lucien Damiba	Burkina Faso
Luna Khatiwada	Nepal
M. Mielke	Tanzania
Mary Kay Jackson	Ghana
Md. Firoj Alam	Bangladesh
Muhammed Alrai	Ethiopia
Nicas Petro	Tanzania

Nik Holbro	Tanzania
Nozilahkon Mukhamedova	Central Asia
Odile Michele Randriamananjara	Madagascar
Olimpia Castillo	Mexico
Pamela White	Nepal
Paul Kimera	Uganda
Paul van Beers	Various countries in Africa
Paulo Kagoda	Uganda, South AFrica
Peter Morgan	Zimbabwe
Peter Sekuma	Uganda
Ralph Hall	Senegal
Richard Muller	Slovakia
Robert Meerman	Various countries
Rosemary Rop	global
Rowland Titus	South Sudan
Ryan Schweitzer	United Kingdom
Samwel Jakinda	Kenya
Sandra Romero Ruiz	Cambodia
Sean Furey	Tajikistan
Sharon Hanson	United States of America
Sosthene Ahanda	Cameroon
Stanley Weeraratna	Sri Lanka
Stef Smits	Colombia, Honduras
Stephan Simon	Sierra Leone
Tiana Zo Andrianina Rakotoarisoa	Madagascar
Tidiane Diallo	Mali
Vincent Mark Abedi	Ghana
Viola Bwanika-Semyalo	Uganda
William Turner	Cyprus, Honduras
Walter Mgina	Tanzania
Yacouba Diallo	Mali
Yaya Ganou	Madagascar, Burkina Faso
Yonas Tsegaye	Ethiopia

Annex 2: Guiding questions

The introduction and guiding questions for each week were as follows:

Week 1: Examples of Multiple Use services

Rural and peri-urban people need water for drinking, cooking, washing, sanitation, watering animals, growing food and generating income. "Multiple-use water services" is an approach to meet people's domestic and productive needs while making the most efficient use of water resources.

In the first week of the e-discussion we would like to learn more about particular experiences where water is used for different purposes, in particular for productive and domestic services. We would like to hear examples that you have observed or experienced where water services are being used for multiple purposes such as domestic use, agriculture and/or production.

The questions for week one are:

1. What do the water services look like in terms of technologies or infrastructure as well as the water quantity, quality, reliability and timeliness of the supplies?
2. Can you describe how these services developed: were they designed for multiple uses or did people just start using them for various purposes, even though this was not the intention?
3. What benefits is this example of multiple use of water bringing - to users and to those managing the service?
4. What drawbacks or problems have you observed with respect to multiple use of water?

Week 2: Multiple Use services and household investments

In the second week of this e-discussion we would like to learn more about your experiences of trying to improve domestic water supplies at household level through investing in MUS interventions. We are particularly interested in remote or marginalized communities. We have two questions for you:

1. Can you share experiences where investments for productive water supply such as irrigation have triggered actual improvements in domestic water supplies, e.g. using income from productive use to improve household water supplies?
2. From your experience what are the driving factors so that investments in productive uses trigger household investments in domestic water supplies, e.g. availability of technical support or of affordable microfinance services?

Week 3: The marginalized and poor and multiple use services?

In the third week of the e-discussion we would like to find out about examples on how issues around equity and inclusion can be properly addressed in integrated approaches. There are three questions:

1. From your experiences how have decisions been made for the allocation of water between productive/agricultural and domestic use?
2. What mechanisms do you know which assure that also the most marginalized do benefit from these multiple water use services?
3. What mechanisms have been used to solve conflicts around water uses? Have these helped to support the marginalized and poorest, and if so, how?

Week 4: How to address the sustainability issues related to MUS system?

In the fourth week of this e-discussion we would like to learn more about how sustainability issues can be addressed adequately in. We have three questions for you:

1. Financial sustainability: From your experience, have you observed an increase in willingness and/ or ability to pay for water services, because water was used for multiple uses? Did this translate in increased revenues for covering operation and maintenance costs, and possibly for making provision for covering longer term major repair and rehabilitation costs?

2. Managerial and technical sustainability: From your experience, have you observed multiple use of water services having positive or negative effects on the maintenance of the water scheme? For example people may rely on the scheme for generating income and thus ensure that it is well-maintained. Or there may be over-use of the scheme.

3. Water resource sustainability: Can you share experiences of how people understand how much water resources are available for different water needs on an on-going basis?