MUS group *Multiple Use water Services*

matching WATER SERVICES with WATER NEEDS




Rural and peri-urban people need water for drinking, cooking, washing, sanitation, watering animals, growing food and generating income. Multiple-use water services (MUS) take this range of needs as the starting point. Using a MUS approach you can make more cost-effective and sustainable investments that generate a broader range of health and livelihood benefits than is possible with single-use systems.

So why isn't everyone taking a MUS approach? Although there are many success stories, scaling up requires changes in the ways that water services are planned, financed and managed. In particular, it requires removing the barriers created by the single-use mentality that dominates the water supply and irrigation sectors.

Multiple-use water services meet people's domestic and productive needs while making the most efficient use of water resources—taking into account different water sources and their quality, quantity, reliability and distance from point of use. A MUS approach can be used to plan a new water service or to upgrade existing domestic or irrigation services.

In a way, MUS is not new. Communities have traditionally managed water for multiple uses from multiple sources. What is new is a systematic approach that can be scaled up. Since NGOs and government agencies first began to apply MUS in the early 2000s, the approach has proven successful in over 22 countries in Asia, Africa and Latin America.

THE BENEFITS OF MUS

Sustainability

The reality is that many people use domestic water services for productive purposes (see Table 1) and irrigation services to meet domestic and productive needs other than field crops. If these uses are not planned for, the result is often damage to systems and conflicts between users. Taking a MUS approach avoids these negative outcomes while optimising positive ones. And, by giving users a greater stake in maintaining the service and income to pay user fees, it contributes to financial sustainability.

Table 1: Households using domestic water services and other water sources in productive activities in Senegal, Kenya, and Colombia

Item	Senegal* (n=1860)	Kenya (n=1916)	Colombia (n=1819)
Median water consumption (litres per capita per day)	23	31	133
Average number of people per household	13	5.1	3.6
Percentage of households engaged in one or more productive activities that used any source of water	74	71	75
Percentage of households engaged in one or more productive activities that used piped water	**54**	**54**	**61**
Percentage of households that earned an income from their piped-water-based activities	**34**	**43**	**39**
Percentage of households that earned an income from their water-based activities (using piped and non-piped water)	49	55	51

*Domestic services encompassed some planned multiple-use (often called domestic-plus services)
Source: Adapted from Hall, Van Koppen and Van Houweling (submitted for review).

Livelihoods

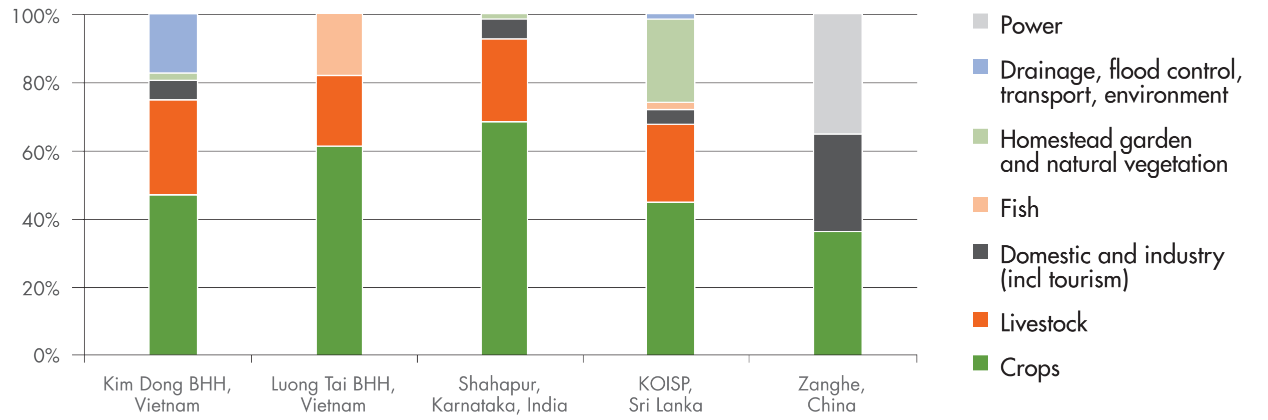
Planning for and supporting MUS enables benefits to increase sustainably and often dramatically. For example, in a domestic supply system, making it possible for people to access more water to support livestock, home gardens and small enterprises can significantly boost incomes, as well as nutrition. Work by Renwick, et al. (2007) has shown that once basic domestic needs are met (approximately 20 litres per capita per day), each additional litre supplied per capita per day (lpcd) can generate an estimated US$0.50–1.00 per year of income. So, for a family of five, increasing water supply from 20 lpcd to 100 lpcd could mean an additional US$200–400 per year. Women and the land poor - benefit most from multiple - use services since they are more likely to engage in income-generating activities in and around the home.

Irrigation water is commonly used for productive purposes other than field crops. Studies in Asia by the Food and Agriculture Organization (FAO) found that more than 50% of the value generated from irrigation systems came from uses other than crop production (Figure 1). Yet few irrigation systems are designed or managed to support such uses. If they were, more users could benefit and contribute fees to sustain the service.

Resilience

Of course, the additional water uses supported by upgrades to domestic systems are often not the main source of income. But with better access to more water, people are able to diversify their livelihoods, as case studies in Bolivia, South Africa, Senegal and Kenya have demonstrated, thereby reducing their vulnerability to economic shocks (Hall et al., n.d. & van Koppen et al., 2009). Multiple-use services that take into account the different water resources available, including opportunities for reuse, can also help communities to become more resilient in the face of climate change.

Figure 1: Share of benefits from various uses of water in irrigation systems



Source: FAO, 2010d, p.39

REQUIREMENTS

Moving from basic domestic supplies to MUS requires planning for higher levels of service in terms of the quantities of water supplied and distance from point of use (Figure 2). Intermediate-level MUS provides the highest cost-benefit ratio (Figure 3). In most of sub-Saharan Africa, upgrading to this level of service would mean doubling or tripling current volumes supplied, of which only 3–5 lpcd would need to be of high enough quality for drinking and cooking. Infrastructure add-ons, such as cattle troughs or outlets to communal gardens may also be required. Establishing new multiple-use services requires multipurpose infrastructure—whether pipes, pumps or rainwater harvesting reservoirs—often used in combination.

In irrigation schemes, the focus of the MUS approach is not so much on increasing the volume of water as on improving access for multiple uses, such as for watering cattle, washing clothes or diversions to reservoirs that could supply households or entire municipalities. FAO's Mapping Systems and Services for Multiple Uses (MASSMUS) guidelines have been used to reform large-scale irrigation systems to support multiple uses in China, India and Vietnam (FAO, 2010a, d & c).

At the policy level, MUS requires unlocking budgets and expertise from the restrictions of single-use systems. It requires supportive norms and standards, more flexible management and operations, and a greater emphasis on the capacity of service providers to adapt services to the needs of users. And it requires transparent, inclusive, participatory planning in which communities are empowered and informed about the technical and institutional options available, and the financial and management implications.

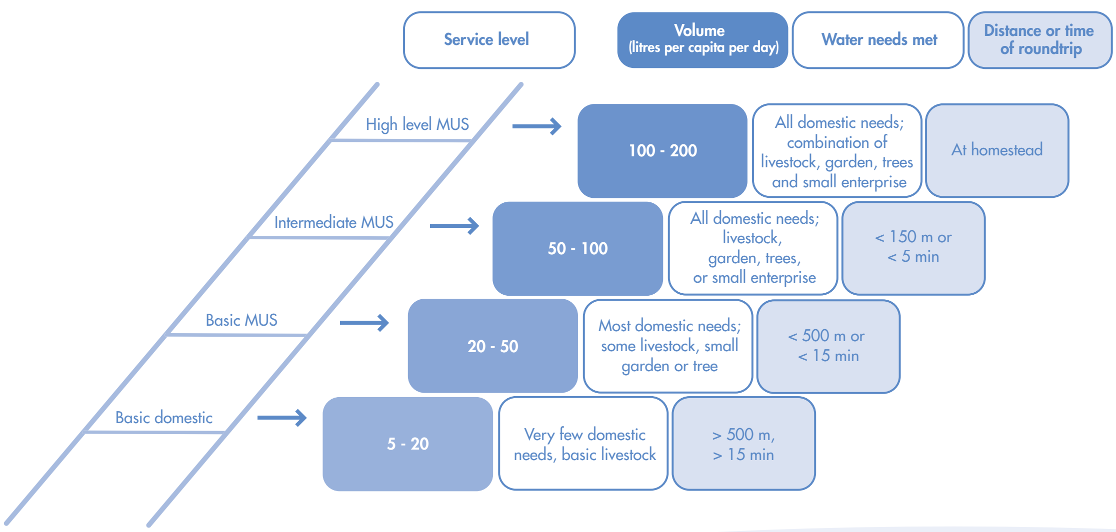
OVERCOMING BARRIERS

'It's not my job' – Professionals in the WASH and irrigation sub-sectors are discouraged or even prevented from responding to people's multiple water needs by perverse incentives, rigid accountability structures, and earmarked budgets. As a result, few public service providers systematically take responsibility for improving poor people's access to water for domestic *and* small-scale productive uses. Overcoming this barrier in the short term will require adjusting mandates and giving local officials more discretionary decision-making power to meet all basic needs. In the long term, it will require training programmes and revised curricula for water professionals.

Water quality concerns – Critics of the MUS approach have objected that using potable water for productive uses is wasteful, or that enabling people to access poor-quality irrigation water for domestic use is irresponsible. But these arguments fail to take into account:

- the reality on the ground – many people already use domestic water supplies for productive purposes and irrigation systems for domestic purposes; and
- the opportunities to minimise risks and increase benefits, such as through low-cost, point-of-use treatment of drinking water and matching available water sources to appropriate uses based on quality and other criteria.

Figure 2: The multiple-use water services ladder



Source: Van Koppen et al. 2007, p. 37

'More for some instead of some for more? How can we afford to upgrade services when many still lack basic access?' This is the dilemma faced by many countries. Although it is true that multiple-use services often require a higher initial investment, they have a superior cost-benefit ratio to single use (see Figure 3). Also, taking a MUS approach contributes to sustainability of existing services and makes it feasible for users to repay capital costs for upgrades or new services. Based on research in Senegal and Kenya, it has been calculated that users could repay capital costs of upgrading to intermediate-level MUS within one year for surface gravity-fed systems and around two years for groundwater pumped systems (Hall, 2012). For new intermediate-level MUS systems, the estimated repayment period is within 13 months for gravity-fed spring systems, and within 30 months for piped systems (Renwick et al., 2007). With access to well-targeted subsidies, loan schemes and appropriate technical support, households and communities would not have to wait for public services to reach them.

In irrigation schemes, a MUS approach can include the landless and other non-irrigators in a share of the benefits and increase sources of revenue (see Figure 4), which could be used to extend the scheme to cover new users.

Shifting from single-use approaches to more flexible multiple-use approaches requires changes in thinking, policy and practice. But the payoff is a broader range of health and livelihoods benefits than from single-use interventions, more sustainable services with better buy-in from users, and new opportunities for financing.

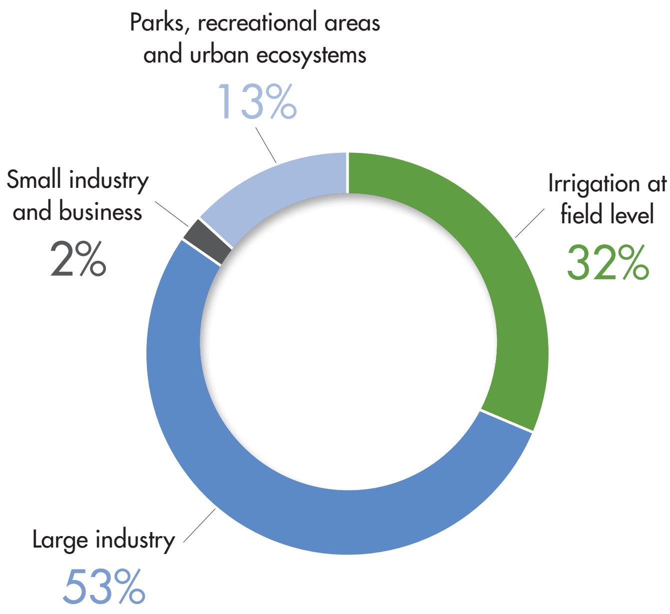
Figure 3: Incremental cost-benefit ratios (CBR) for new services

	Cost	CBR
Highest level MUS	$140	1.3
Intermediate level MUS	$56-105	3 - 8
Basic level MUS	$98 - 116	.67
Basic Domestic	$63 - 91	0

Cost-benefit ratios calculated assuming a discount rate of 10% where costs equal the per capita hardware and software investment costs in year 1 less the present value of the stream of annual per capita mean income benefits net of annual per capita recurrent costs (operation and maintenance, source water protection and capital maintenance fund) over the useful lifetime of the infrastructure. Does not include non-financial benefits.

Source: Adapted from Renwick et al, 2007, p 43

Figure 4: Water fees contributed by various users to Fenhe Irrigation District, China



Source: Adapted from FAO, 2010a, p.27

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For more information about MUS, see www.musgroup.net

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