Report MUS Group meeting 30-31 March 2015
Hosted by IRC, the Hague, the Netherlands

Background

Most of the focus in MUS has been on a bottom-up effort, starting with poor people's multiple water needs, and advocating for policy change to meet these needs. Little attention has been paid as yet by the MUS Group and by the global water community, to the link between MUS as pro-poor water service delivery and water resource management in general and water tenure in particular. This MUS Group meeting sought to fill this gap, also by inviting experts on these issues from beyond the MUS Group.

In 2011, the MUS Group started drafting a framework of indicators for MUS projects. As more and more organisations are developing MUS projects, the need for such indicators – whether these are to measure the outcome of MUS, or rather elements of the process towards MUS services – becomes more necessary.

Goal

The goal of the meeting was to identify the potential contributions of a MUS perspective to the water resource management and water tenure debates, in particular ongoing global efforts to strengthen justice and equity considerations.

A second goal of the meeting was to develop a framework of indicators for MUS, by compiling past efforts to define such indicators, and expand on them.

The final goal, as always, was to serve as a platform to share case studies of recent work from member organisations.

Opening

The meeting was opened by Stef Smits (IRC and secretary of the MUS Group). In his opening remarks, he welcomed all participants to IRC, explaining the long-standing commitment of IRC to the topic of multiple-use services and as supporter of the MUS Group.

On behalf of the MUS Group, Barbara van Koppen (IWMI and coordinator of the MUS Group) thanked IRC for hosting this meeting. In her opening remarks, she gave some further background to the topic of the meeting. She explained how the previous MUS Group meeting saw some practical experiences on local level water resources management so as to improve water services for multiple uses. This meeting would build on that, by specifically looking into water tenure arrangements. She also explained some of the past work on indicators for MUS, to take forward in this meeting.

A round of introductions was done, with the different participants presenting themselves. See annex 1 for the participant list.

Block 1: MUS, water rights and water resources

MUS, water rights, and water resource management. By Barbara van Koppen (IWMI)

This introductory presentation to the block on water tenure, started with some considerations on equity and justice in water allocations. Often we are faced with questions on whether there is enough water for MUS for all? To answer that question, we often have to look into the water tenure arrangements, a topic further elaborated in the presentations to come. This is an important question, because water should be allocated to people, each with multiple water needs, and not to "sectors" (like WASH, irrigation, and so on), as is so often done in discussions on water allocation. By focusing on sectors, you ignore differences within the sectors. Moreover, within these water allocations, there is little attention to the small-scale water users. The different allocation regimes – that will be discussed in more detail in the presentations below – struggle to recognise the informal water use by these small users. Legal pluralism is an important concept in this. There is need to find a balance between the need to regulate the big users and the need to provide a legally strong general authorisation to the many small-scale users. A final consideration in the water rights discussion is the human right perspective.

Water tenure. By Stephen Hodgson

Stephen's presentation provided a comprehensive overview of the concept of water tenure and the various tenure arrangements that are currently found across the globe. The origin of this overview is in the FAO voluntary guidelines on tenure of land, forestry and fisheries. In the development of these guidelines, it was originally planned to include water as well. But whilst working on it, it was felt that water provided many additional complexities that couldn't be easily addressed. Tenure is defined as 'the relationship, whether legally or customarily defined between people and people and the resources'. It is a social construct and applies to formal law and customary or local law. In mapping current tenure arrangements, Stephen found at least 10 different types of water rights, and 5 types of informal law, each with its own strength and weaknesses. Tenure rules define also the type of use (and attributes of the service for that use, such as quantity and quality). However, the nature of the legal relationship is indifferent to the type of water use. Some of the uses may be well-regulated through tenure arrangements, whilst others not. Stephen mapped the existing tenure arrangements in relation to the different water uses.

Water services and water tenure. By: Robina Wahaj, FAO

Robina's presentation built on the one by Stephen Hodgson, arguing that an analysis of tenure relations can be applied at different levels: 1) cross-sector; 2) intra-sector; 3) upstream-downstream. In order to do so, it is important to carry out a mapping of the different water services in an area, and the tenure arrangements for them. In addition, she recommends to also map the productivity of each of the water services. Finally, one has to map the users behind each of the uses, in order to identify the gender dimensions behind them.

License systems and informal water rights in farmer-led irrigation development. By: Gert Jan Veldwisch (WUR)

A main focus of Gert Jan's presentation was on infrastructural development to get a water right. This is called hydraulic property creation. By investing in infrastructure development you create the right, and if you participate in maintenance, you maintain the right. This is particularly relevant in small-holder irrigation, where farmers themselves develop irrigation systems, which are de facto used for multiple purposes. If external agencies intervene in such systems – e.g. for rehabilitation or improvement works – the water rights may be up-set. Therefore, a key issue is mapping the informal water uses and understanding the tenure arrangements behind them. In analysing tenure system that addresses all needs of these farmers, you need to find a balance between the cumbersome procedures of registering and keeping the licenses up to date and protecting the rights of the poor. An alternative is to apply the same as for squatters "if you have developed and used infrastructure for a certain period, you have an established right"

Need to quantify human right to water for livelihoods. By: Barbara van Koppen, IWMI

In her second presentation, Barbara provided a human rights lens to the discussion on water tenure, highlighting the human right to water, and making an argument to a human right for water for livelihoods. She also showed that from a water resources point of view this should not be a problem, given the small amounts concerned. It is more a (re)distribution issue.

Discussion and conclusion

In the discussion that ensued, the following issues were raised:

- Tenure is often understood to refer to access to the resource, and not to the service. In order to get a water service, one also needs to have access to the resource, also through some kind of tenure arrangement. But that is not enough, there also needs to be clarity on who is the service provider, the ownership of the infrastructure assets and other issues. In that sense, something that needs to be included in the concept of tenure is the close link between water resources and the infrastructure to turn it into a service. By investing in infrastructure, you often create a hydraulic property.
- There is not one single type of tenure that fits all, because the types of use are different in their nature. For in-stream fishing other types of tenure will be more relevant than for the hydropower generation.
- There are differences between countries in terms of tenure arrangements around rainwater, and its harvesting. In civil law countries, there are generally no problems around it, and the one on whose land rain falls, can capture it. But some countries have legislation about it, because harvesting rainwater affects water availability to downstream users.
- Groundwater tenure is more difficult. There are many examples where a race to the bottom is happening.
- Water tenure mainly refers to national waters. It doesn't apply so much to transboundary waters. It provides some ideas but cannot be fully applied in transboundary situations.
- In theory, tenure also refers to the quality of the water. But this aspect needs more elaboration and discussion. So far, it mainly focuses on quantity.
- In relation to water tenure, there is need to strengthen the watchdog role of NGOs. They can support communities in mapping of water users and object against water rights that are being infringed upon. This calls for good water accounting.

- The human right to water is still woolly – because it is not real international law. That depends on how countries have elaborated. Also the human right has been used more in a service context (e.g. litigation against disconnections) than a water resources one. But water tenure provides tools to operationalise the human right to water

In conclusion, it was considered that water tenure provides a useful concept for multiple use water services. In any situation, there would be a need to map the different water uses, both formal and informal, and the tenure arrangements behind them. This is particularly relevant in the context of self-supply, or user-driven water investments, as those are most often informal and most vulnerable, or where interventions are planned in systems developed originally by users.

As next step, the MUS Group could develop a fact sheet around rights to water and tenure and relation with MUS, and include case studies how water tenure affect multiple use and how MUS shapes water tenure. A small group formed by Robina Wahaj, Louise Whiting, Gert Jan Veldwisch and Barbara van Koppen indicates interest to take this up. Barbara promised to send a first draft.

Block 2: Indicators

"MUS – do you know it when you see it?" What to measure and how? By Rochelle Rainey (USAID)

Prior to this meeting, Rochelle Rainey had prepared a handout with a framework of MUS indicators (see Annex 2). This framework was the results of the MUS roundtable held in Bellagio in 2012 , and in the email exchanges that followed it. Rochelle consolidated that discussion, by arguing that a framework for MUS indicators would require four types of indicators:

1) sectorial ones. These are the indicators that are typically already used in the various water using sectors. A MUS project could be measured against the sum of the sectorial indicators.
2) degree of integration. These are more process indicators to measure how MUS was developed, including the different needs and perspectives of users
3) value added. These are the key indicators to assess whether a MUS project is more than the sum of, for example, a WASH and an irrigation project. This would for example measure the cost-effectiveness of an integrated approach.
4) enabling environment. This refers to indicators that describe whether national policies, strategies and financing mechanisms are conducive and supportive to MUS.

MASSMUS indicators. By: Robina Wahaj

In this presentation, Robina explained the indicator framework used in FAO's MASSMUS approach indicators. This includes external indicators (to compare results across systems), and internal ones (to assess how for example the management of an irrigation systems takes multiple use into account).

Discussion and conclusion

After these two inputs, a group discussion was started by Marlies Batterink (Aqua for All) who had approached the MUS Group on this topic a few weeks before the meeting. In the discussion, the following issues were discussed:

- An indicator set should relate to the service level received by users, in terms of quantity and quality.
- A second part of the indicator set should relate to the outcomes of water use, per type of users and the distribution and equity in those. That would for example include the number of livestock that can be kept or the area of gardens under irrigation, and eventually the increase in income
- All agreed that process indicators are another important set. Those indicate the degree of integration that may have taken place and the extent to which users' needs are taken into account in for example technology selection
- A more complicated part of the indicator set would be the sustainability (in financial, environmental and managerial sense) of services. There are already several sustainability tools in use in the sector that can be used for that
- A fifth part of the set are the enabling environment indicators, for example, the extent to which MUS is taken up in county- or national-level planning processes.
- All in all, this should result in value added indicators of the cost-effectiveness of interventions.

As next step, it is suggested that the MUS Group works towards a guideline or manual on how to define MUS indicators. In this it is recognised that the specific indicators will always be context specific and depend on the scope and type of project. But a manual can help in the process of defining those. As secretary, Stef Smits will elaborate a small project proposal on this.

Block 3: Case studies

In this block, IRC, as host of this MUS Group meeting, started by presenting some of its ongoing MUS-related work. This was followed by case work of all other MUS Group members

MUS in Honduras. By: Andrés Gil, IRC

In this presentation, Andrés presented an evaluation of a series of MUS pilot projects carried out in Honduras. In these projects, conditions for MUS were created, but not everywhere applied, for several reasons. One of these was fear by neighbouring communities around over-use of water resources. Andrés concluded that the originally developed guidelines for MUS indicated the maximum type of MUS that can be attained, but that in reality the extent of MUS can be lower.

Water supplies in pastoralist areas of Kenya: Providing water for people and cattle. By Mélanie Carrasco, IRC

This presentation highlighted the methodology to come to a detailed assessment of water demand towards planning water interventions for people and cattle in pastoralist areas of Kenya. These demands are then used in local level water development planning. This proves to be particularly difficult, given the semi-nomadic cattle rearing practices, upon which water development may have influence. For more information
http://www.ircwash.org/projects/kenya-arid-lands-disaster-risk-reduction

Securing benefits from MUS in Ethiopia. By: Marieke Adank, IRC

Marieke presented examples of how Millennium Water Alliance partners included MUS into their programming, following several awareness raising and training events. This range included

examples from self-supply to domestic-plus to irrigation plus. Though there is now indeed some awareness and some effort to address MUS, it is still done in an ad hoc and little structured manner. A more systematic approach would still be needed, for example to assess up- and downstream issues and sharing of water resources, as many communities have fears around over-use of water resources for MUS.

Experience of GWI programme with household irrigation. By: Bethel Terefe. IRC

Bethel's presentation focused on the household irrigation unit that was set-up under the agricultural transformation agency in Ethiopia. CARE through the Global Water Initiative (where Bethel used to work) has been supporting this programme, the experiences of which were presented by Bethel.

Experiences with MUS in Nepal. By Chiara Ambrosino

This presentation started with a video of the iDE approach towards MUS in Nepal, mainly through gravity-fed piped systems. This was complemented by a presentation by Chiara, also highlighting the importance of market development through the "commercial pocket approach" in order to commercialise the products from these MUS systems.

Sustainability and replicability of MUS in Nepal. By Barbara van Koppen (IWMI)

Barbara presented on behalf of her colleague Floriane Clément the results on a study into the sustainability and replicability of the MUS approach in Nepal. This study provided evidence that the functionality of MUS systems in Nepal is higher than of the conventional ones. It also highlighted the importance of institutions for maintenance, and confirmed the benefits of MUS. The full report of the study is available at http://www.musgroup.net/home/publications_and_resources/books_case_studies_and_reports/nepal_sustainability_and_replicability_of_multiple_use_water_systems

MUS experiences and equitable water management in West Africa. By: Vincent Casey, WaterAid

This presentation included some recent experiences of WaterAid in West Africa, with what is called SWRA (Securing Water Resources Approach), which combines delivery of WASH services with actions that strengthen resilience livelihoods and health. In this, it seeks to move beyond local level water resource management, but focus on linkages between communities and local government and even higher up.

Making water from multiple sources potable: HWTS field test results from Ghana. By: Eline Boelee (Water Health)

This presentation makes a case that household water treatment systems should be seen as part and parcel of multiple-use services, given that much of improved water sources do not provide actually good quality water, and because often recontamination takes place at the homestead. This case presented an evaluation of a HWTS filter, showing high performance in terms of water safety. But there was also much appreciation for the convenience and taste aspects from users. However, the high costs of this particular type of filter will make it more suitable for upscaling in peri-urban areas.

MUS and self-supply in Ethiopia and other countries. By: Henk Holtslag

This presentation showed the importance of self-supply in increasing access to water services, also showing how most self-supply is used for multiple purposes. It then showed the various technological options available for self-supply, including for recharge of groundwater.

SolutionMUS. By: Mary Renwick, Winrock International

SolutionMUS is a systematic approach to planning multiple use services, based on the experience of Winrock in a number of countries from across the globe. There is now a dedicated website, with resource material, case studies and guidance material. In her presentation, Mary explained the key concepts behind SolutionMUS and illustrated this through a number of case studies

Block 4: Update from members

In this block, members gave updates on other MUS-related work, not yet covered in any of the previous case studies.

FAO: Is busy with further incorporating gender into the MASSMUS approach, together with UNESCO-IHE. This work will possibly be done in Morocco. Also, the MASCOTTE module will be reviewed in terms of gender, so that one consolidated methodology is prepared. Another area of focus of interest to this group is the topic of water tenure. FAO plans to publish a series of case studies on this.

IWMI: The African Development Bank has approved a proposal for a MUS project in South Africa. The idea is to use the tools for local planning for integrated development for water. This project is managed by the Water Research Commission. And there is now tendering for NGOs to implement it.

USAID: Rochelle tried to sound out within USAID for updates on MUS related works, but with little response. Still, the many presentations made during this work, show that USAID is probably the biggest donor supporting MUS work seeing cases supported by USAID from Nepal, Kenya, Ethiopia and Tanzania. The presidency initiative to feed the future could be an interesting possibility to take the MUS work forward. What is important within USAID is to be able to show the added value of MUS.

WEDC: Anne Blenkinsopp who attended the meeting, is the new Director of WEDC. There are currently several PhD and MSc studies going on around the use of multiple sources for multiple use, including work on risk assessment around self-supply. Also work on MUS in Colombia. There is the annual WEDC conference coming up in July, focus on interrelations between sub-sectors. So far there are no side sessions on MUS. Anne will provide the link to the submitted papers and the overview of ongoing MSc and PhD research.

Block 5: MUS Group activities

Stef Smits provided an update from the secretariat. In this, he highlighted above all the massive growth in our mailing list, after the merger with the RWSN-hosted D-Group on MUS and the e-discussion on the topic last year. The advantage of the D-Group is that members can post questions or start discussions, so it is more interactive. Stef encourages everyone to starts using the interactive facilities of the D-Group.

During the World Water Forum in Marseille three years ago, the MUS Group committed to work further on guidelines and develop case studies on MUS. There is a possibility to report back on this at the World Water Forum in Korea. Francois Brelle will go on behalf of ICID. The proposal is to put a dedicated message on the website, which would include a compilation of the case studies that were presented since 2012 and frame these against the commitments. Also FAO is going and could report on behalf of the MUS Group. Barbara commits to making this report and send it around to the core members for inputs. (Note: because of time constraints running up to WWF7, the note has been finalized by few core members only).

There are no planned activities around MUS at the Stockholm World Water Week. Also, only a few of the members plan to attend.

There is a proposal from iDE, IWMI and FMIS to hold the next MUS Group meeting in Nepal. Also several other members have strong presence in Nepal and are keen to c-organise it. The proposal that is crystallizing out is that it would be held in the second half of Nov (probably 18-20 Nov), and that it will have a regional focus on South Asia, with a thematic focus on validating the indicators and sustainability of MUS services. Barbara will liaise with others to confirm the dates and start organising it.

Annex 1: participant list

#	Name Participant		Organisation	Country
1	Chiara	Ambrosino	iDE UK	United Kingdom
2	Marlies	Batterink	Aqua for All	The Netherlands
3	Anne	Blenkinsopp	WEDC, Loughborough University	United Kingdom
4	Eline	Boelee	Water Health	The Netherlands
5	François	Brelle	Societe du Canal de Provence	France
6	Vincent	Casey	WaterAid	United Kingdom
7	Bethel Terefe	Gebremedhin	CARE Ethiopia	Ethiopia
8	Andrés	Gil	IRC Associate	Honduras
9	Stephen	Hodgson		Belgium
10	Henk	Holtslag		The Netherlands
11	Barbara	Koppen van	IWMI	South Africa
12	Walter	Mgina	CI/SHIPO	The Netherlands
13	Maarten	Onneweer	RAIN	The Netherlands
14	Rochelle	Rainey	USAID Global Health Bureau	USA
15	Mary	Renwick	Winrock International	USA (via video conference)
16	Stef	Smits	IRC	The Netherlands
17	Gert Jan	Veldwisch	Wageningen University	The Netherlands
18	Robina	Wahaj	FAO	Italy
19	Louise	Whiting	WaterAid	United Kingdom

Annex 2: Handout on MUS indicators

By: Rochelle Rainey, USAID

For the development of the Multiple Uses Water Services (MUS) indicator framework, we used this definition:

An approach to planning, financing, developing and providing sustainable water services to meet people's domestic and productive water needs in an integrated manner, making most efficient use of water resources

MUS is a combination of:

- Taking people's multiple water needs as starting point
- Focus on sustainable services provision
- Objective of having direct impact both on livelihoods and health

MUS uses a Service Delivery framework, much of which is similar in structure and substance to irrigation or WASH service frameworks, with the big differences lying in:

- Participatory and inclusive needs assessment
- Planning of services considering multiple needs, water sources, existing infrastructure, financial and institutional capacities
- Resulting in clearly defined service levels (quantity, quality, reliability, accessibility, flexibility)

This may mean additional or different requirements for:

- Management and operations: priority setting and conflict resolution around parameters of multiple uses
- Capacity of the service provider and the ones providing technical support: adaptive capacity
- Financial frameworks: fee setting, cost recovery, cost sharing; accounting for differential water use
- Monitoring: against the service delivery indicators

MUS needs a suite of indicators to capture the range of activities and benefits at different levels. The categories of indicators we have identified as listed below, and a table of illustrative indicators follows (Table 1):

1. Sector specific indicators – may need to revised when Sustainable Development Goal indicators are finalized
    a. for WASH - level of service (quality, quantity, reliability, accessibility)
    b. for "the other use", which for this exercise is irrigated agriculture.
2. Indicators of "Integration" – the extent to which multiple needs are assessed and met by the MUS program.
3. Indicators of "Value Added" from MUS (compared to stand alone projects in the same geography). This area of MUS is weak, but Ralph Hall compiled a learning agenda to fill this gap.
4. Indicators of the "Enabling Environment": policy framework, strategies, financing, monitoring and evaluation

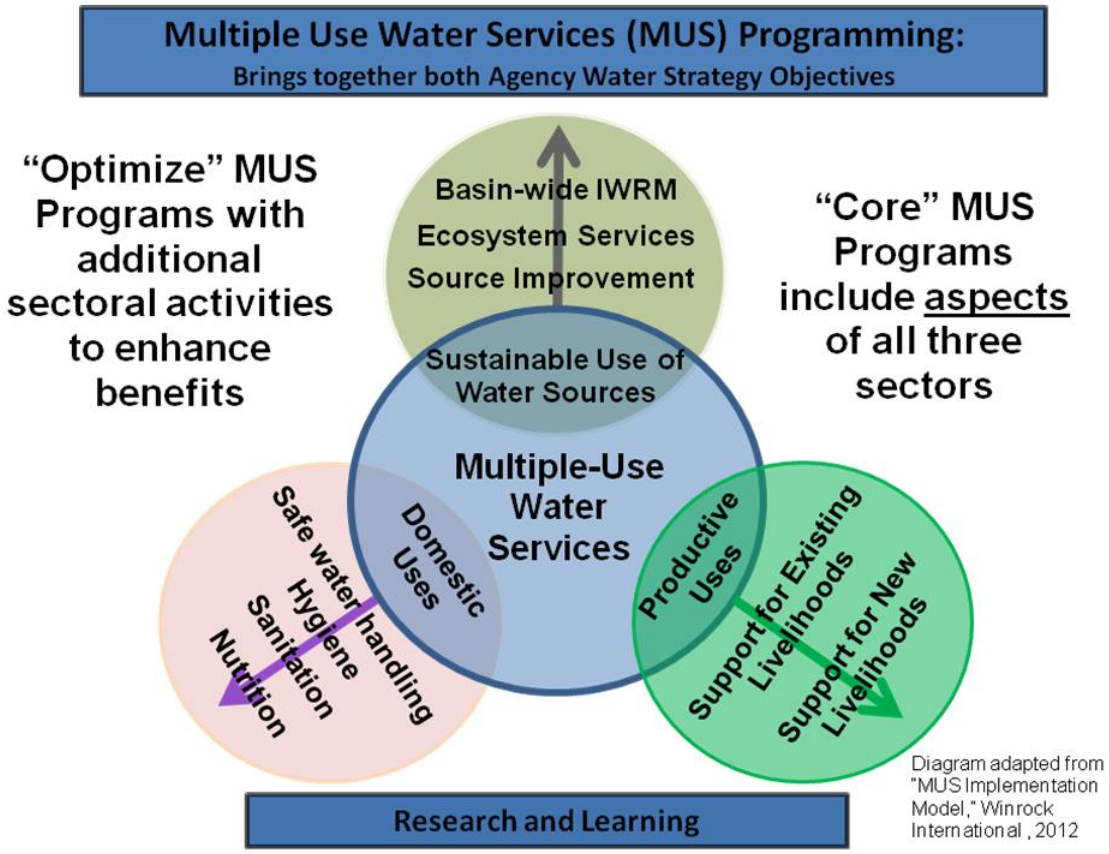

Table 1: Proposed MUS Categories of Indicators and Illustrative Indicators (disaggregate by sex)

Category	Illustrative Indicators
1a WASH-specific indicators – available from WASH sector, moving towards service levels - what a user receives in terms of water quantity, quality, reliability and accessibility: "domestic use"	**Output indicators** Number of people gaining access to an improved drinking water source Number of people receiving improved service quality from existing improved drinking water sources Number of people gaining access to an improved sanitation facility Number of water users associations trained in MUS Number of water users associations trained in Water Safety Planning Number of communities certified "open defecation free" (ODF) Costed components of delivering water service (capital investment, operations, replacement, etc.) **Outcome indicators** Percent of households using an improved drinking water source Percent of households using an improved sanitation facility Percent of households in target areas with soap and water at a handwashing station commonly used by family members Percent of households in target areas practicing correct use of recommended household water treatment technologies Percent of population in target areas practicing open defecation Percentage of water supply breakdowns repaired within 3 days Percentage of water supplies that receive regularly scheduled maintenance Percentage of water supplies with a Water Safety Plan **Impact indicators** Percentage of children under five with reported diarrhea in last two weeks Percentage of children under five who are stunted
1b Irrigation-specific	**Output indicators**

Category	Illustrative Indicators
indicators – available from irrigation sector: "productive use" (did not include small scale industry or aquaculture here – those can be next step)	Energy consumption rate of equipment Distribution uniformity of irrigation water Condition of equipment, canals, reservoirs and other structures Quantity of water used for irrigation Type of crops grown and area per crop grown with new irrigation capacity Cropping intensity Pests and diseases encountered and control measures Timeliness of operations Cost of repairs and servicing of equipment, canals and structures (operation & maintenance cost) Access to credit – source, interest rates, etc. Asset ownership Number of people trained on new livelihood opportunities enabled by irrigation Gross or net production per volume of water applied **Outcome indicators** Number of hectares under cultivation in dry season using promoted irrigation technologies Adoption rate of technology Frequency of breakdown and time to repair Changes in water quantity and quality Erosion occurrence (soil loss/accumulation) Changes in soil salinity, alkalinity, sodicity, acidity and fertility Presence of water-related diseases, such as malaria and bilharzia, and degree of human infestation, in relation to the status before the introduction of irrigation Waterlogging/poor drainage Conflict management Time needed for advance notice of water delivery Reliability of water distribution Yield per area per year Percentage/number of women and men land users who reach their targeted income levels **Impact indicators** Increase in farmer's income Value of Net Present Value (NPV), Benefit/Cost (B/C) ratio, Internal Rate of Return (IRR) compared to the value established during project preparation Nutritional status of the family Change in living conditions Ability to pay school fees Employment creation Advancement of women Food security status of the area Improvement in service provision Number of additional cropping seasons enabled by irrigation Percent of households that earn income from new or alternative income-generating enabled by MUS system Number additional hectares irrigated (but from how many m3 delivered to how many hectares irrigated to production growth might not always be proportional)
2 Integration/Process Indicators: How is "MUS by design" different than two (or more) sector-specific water programs implemented in the same geography?	**Process indicators** Number of women engaged in planning of new water systems that address water-dependent sources of livelihoods and water needs Percentage beneficiaries satisfied with their level of engagement in the planning process/needs assessment Percentage of new water projects that assessed demand for all water needs, not sector specific Existence of representation of different user groups in decision

Category	Illustrative Indicators
	making body / service provider Existence of clear tariff structure, that defines tariff levels for different user groups or according to water use patterns Presence of a water/sanitation committee or system maintenance group for each MUS system Level of community skills to implement preventive maintenance activities of community water supply systems; Level of knowledge by communities about where to get technical support in case of system breakdown. Number of households financially contributing to service delivery and maintenance of the community water supply system (through water use fees or some other collection mechanism) Number of successful repairs Money spent per year on system **Output indicators** Percentage of households adopting livelihood from water source Number of cross trainings for operations and maintenance of water supply for all uses Number of policy-makers, media, and scholars knowledgeable about or aware of MUS Community "sense of ownership" measures of MUS system Availability of spare parts for drinking water and irrigation/trained mechanics **Outcome indicators** Index of user satisfaction with water services for multiple uses - "satisfaction with the service received as compared to the agreed upon service" Indicators could also be designed to capture information relating to user satisfaction with the quantity, quality, reliability, accessibility, flexibility, etc. of their services. **Impact indicators** Use of a sustainability index tool to track sustainability of MUS systems
3 MUS Value Added/Learning Agenda Indicators: What is gained by integrating two (or more) sector-specific water programs in the same geography, in terms of more sector-specific results, same results as sector-specific activities but at less cost, benefits that only come because the water services are integrated?	**Defining the MUS Categories:** Do we have clear guidelines that can be used to classify/categorize the various types of MUS services – i.e., MUS-by-design vs. Domestic Plus vs. Irrigation Plus? How much water can/should be used for productive vs. domestic activities? Are there general rules that can guide practitioners and decision-makers in allocating water to different uses? Need more data and analysis of different operational models **Economic Impact:** Are families using MUS-by-design services, wealthier (broadly defined) than families served by traditional water services? Household wealth can be measured using a wealth index. Total income earned from water-based activities. Percentage of total household income earned from water-based activities. Expenditure saved from water-based activities. Funds allocated per category to measure efficiency per sector? Xm^3 drinking+ Ym^3 irrigation/gardening+ Zm^3 livestock per dollar invested, compared to costs of single use systems per dollar invested Better quantification of non-financial costs/benefits - value of health, environmental benefits from MUS **Health:** Are families using MUS-by-design services, healthier than families served by traditional water services? Use WASH health indicators. Time spent collecting water from MUS-by-design services vs.

Category	Illustrative Indicators
	traditional water services. Focus on nutritional intake from kitchen gardens/crops/livestock products. What are the nutritional impacts of MUS approaches that seek to optimize productive and domestic uses of water? **Cost-effectiveness:** Are MUS-by-design services more cost-effective than a series of standalone projects (in the same geography) that are targeted at realizing similar objectives? Annual cost of operation/maintenance and replacement (if necessary) of the systems implemented, per person. So for two systems compared in a same society, which is the cheapest for equivalent services provided More and better financial cost information - how much does it cost in time and money to use MUS approach and two siloed water projects? Maybe MUS projects could try to calculate money allocated per category to measure efficiency per sector? **System Sustainability:** Are MUS-by-design services more financially sustainable than traditional water services? "working ratio" for financial sustainability frequency of breakdowns time between breakdown and repair total number of days per year the system is out of operation Are MUS-by-design services more technically sustainable than traditional water services? index of sustainability as a function of the percentage of the system that is operational, the number of system breakdowns in the past year, and the community perception that system will be working in the next 1 to 5 years **Environmental Performance:** Do MUS-by-design services operate within ecosystem/watershed limits? There is no easy way to compare the environmental impact of MUS-by-design services with that from traditional services. Thus, we need to develop an objective way to measure environmental performance across communities and different typologies **Empowerment:** Do MUS-by-design services provide greater opportunities for women and minority/low income groups when compared to the opportunities available to these groups using traditional water services? Indicator(s) to be developed **MUS vs. Domestic Plus vs. Defacto Domestic Plus:** Do MUS-by-design services provide greater benefits than Domestic Plus/Defacto Domestic Plus services?/Do MUS-by-design services provide greater benefits than Irrigation Plus/Defacto Irrigation Plus services? All the measures developed to study MUS-by-design services can be used to support this type of analysis. • Total amount paid by each household for services and system maintenance (and existence or not of a social safety net for community members who cannot afford to pay); • Existence of sustainable and transparent financial management of community contributions/system revenue and expenditures (including: Who establishes the tariffs? Who collects money? When is the money collected? Where is the money kept? How are community member payments registered? What measures are taken if households/individuals do not pay? How is money disbursed (e.g., for maintenance or repairs)? What checks and balances (and oversight mechanisms) are in place regarding

Category	Illustrative Indicators
	finances?). • Annual cost of operation/maintenance and replacement (if necessary) of the systems implemented, per person.
4. Enabling Environment indicators	**Output indicators** Definitions of irrigation plus and domestic plus - What is the maximum size of productive activities that could be allowed to use piped water from a domestic+ system? Document the cost of missed opportunities - financial costs to retrofit a single use system to take advantage of opportunities to optimize through MUS Number of presentations at high level fora on MUS **Outcome indicators** Number of analyses of common barriers at national or subnational levels that impede joint planning, design, construction and maintenance of MUS systems Number of new policies, laws, agreements, regulations, or investment agreements (public or private) implemented that promote multiple use water services Public sector expenditures on MUS systems as a percentage of local budget Percent of a water supply that is non-revenue