



A Guide to SolutionMUS

*Putting multiple-use
water services into Action*

SolutionMUS
delivering water's promise

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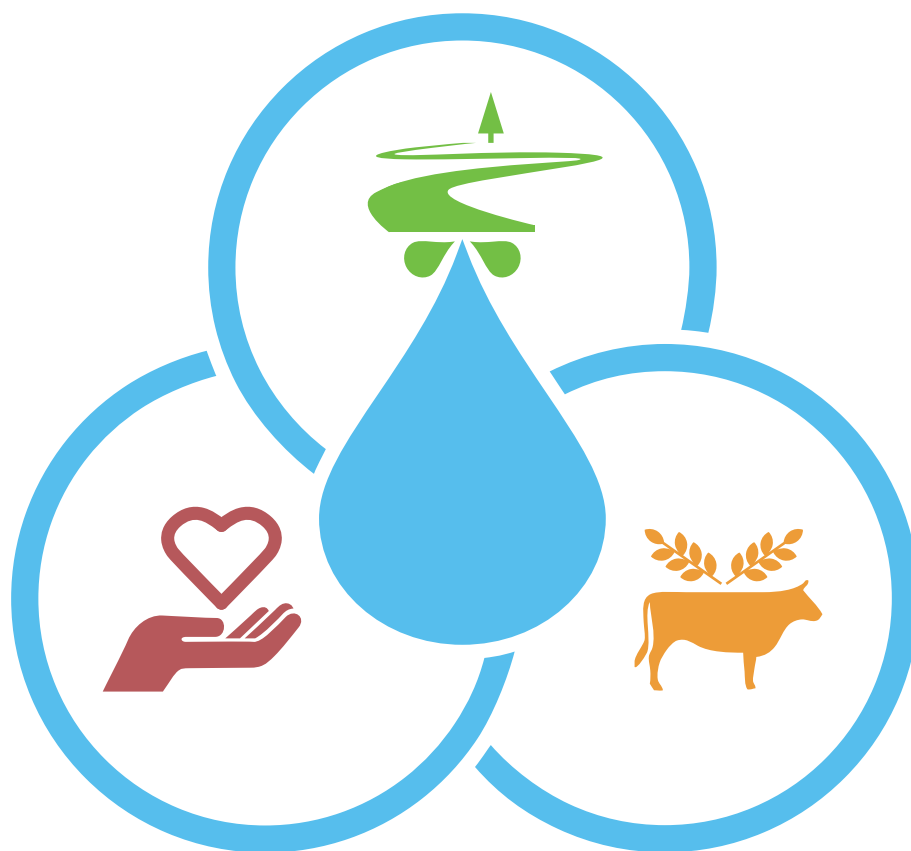
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Multiple-use water services (MUS) offer a holistic approach to meet people's multiple water needs. **SolutionMUS is a tested methodology for delivering MUS** in combination with complementary, impact-boosting programs that improve health, livelihoods, and the environment.



WATER

Create equitable and sustainable water services to meet people's drinking, hygiene, and livelihood needs.



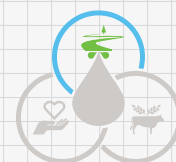
HEALTH

Deepen health impacts by adding support programs for hygiene, sanitation, or nutrition.



LIVELIHOODS

Enhance food security and income generation by adding support for crops, livestock, and enterprises to expand livelihood impacts.



ENVIRONMENT

Ensure environmental sustainability of water services by protecting sources, maintaining environmental flows, and treating wastewater.

HOW SOLUTIONMUS WORKS.

LOOK AT PEOPLE'S NEEDS



What uses do people have for water?

Where do they use water?

What quality do they need for each use?

How much water is needed for each use?

LOOK AT WATER SOURCES



What sources are available at different times of year?

Where is each source?

What is the quality of water from each source?

How much water can be sustainably used from each source, both today and under expected climate change scenarios?

CREATE WATER SERVICES TO IMPROVE HEALTH, LIVELIHOODS, & THE ENVIRONMENT

Can the sources be sustainably transformed to better meet water needs?

What types of training and management will support the water services?



How can the health benefits of water services be optimized by adding hygiene, sanitation or nutrition activities?

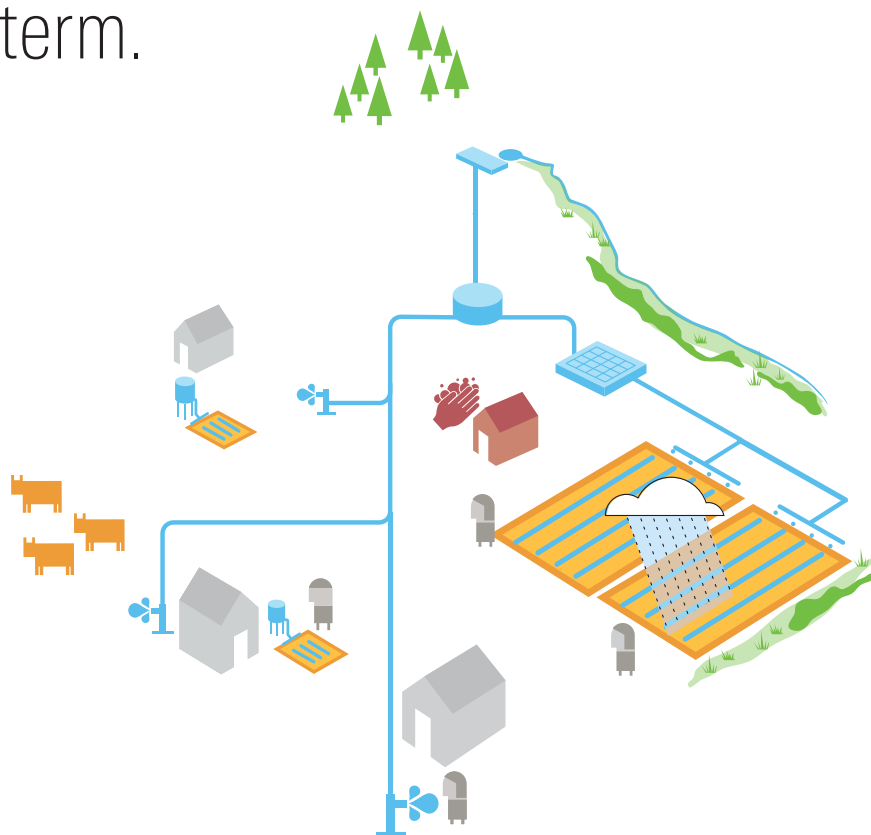


How can the livelihood benefits of water services be optimized by adding support for water-related livelihoods activities such as livestock, crops and enterprises?



How can the environmental sustainability of water sources be ensured through source protection and watershed management?

SolutionMUS is a holistic, participatory approach to water that improves livelihoods and health, protects the environment, increases sustainability, and ultimately improves people's lives. By addressing people's multiple water needs, SolutionMUS maximizes impact over the long term.



BETTER HEALTH

Potable drinking water improves people's health. Complementary hygiene, sanitation, and nutrition investments amplify health impacts.

MORE INCOME

Most livelihood activities depend on water. Improving water availability and investing in complementary livelihoods activities leads to sustainable gains in incomes and food security.

IMPROVED SERVICE SUSTAINABILITY

Income from livelihoods activities provides users with the resources and incentives to cover ongoing operation, maintenance, and repair costs. Because services better meet the needs of users, conflict over water and damage to infrastructure caused by "illegal" or unplanned uses decreases while community investment increases.

GREATER ENVIRONMENTAL SUSTAINABILITY

Properly designed and managed water services protect environmental flows and long-term sustainability of water resources.



Inspirational Examples

1 Inspirational Examples

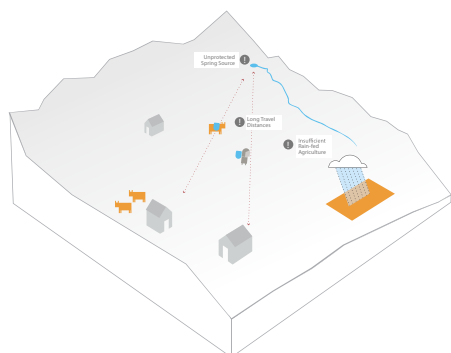
SolutionMUS brings improved opportunities to a variety of contexts, from remote mountain villages to dense peri-urban environments.

The following examples showcase the SolutionMUS approach in three situations, demonstrating the tangible and intangible benefits to households, communities, and districts.*

1

RURAL

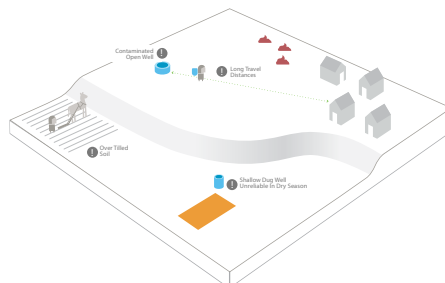
Single Source for Multiple Uses
Mountainous region with natural spring



2

RURAL

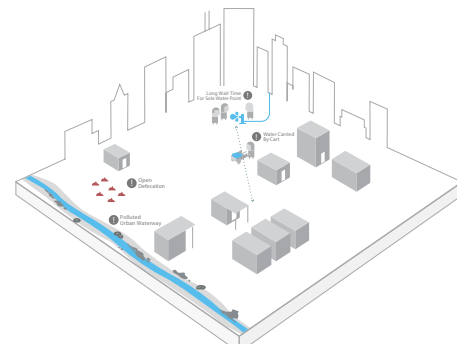
Multiple Sources for Multiple Uses
Flat rural area relying on shallow groundwater



3

URBAN

Multiple sources for Multiple Uses
Peri-urban community with distant tapstand and contaminated urban waterway

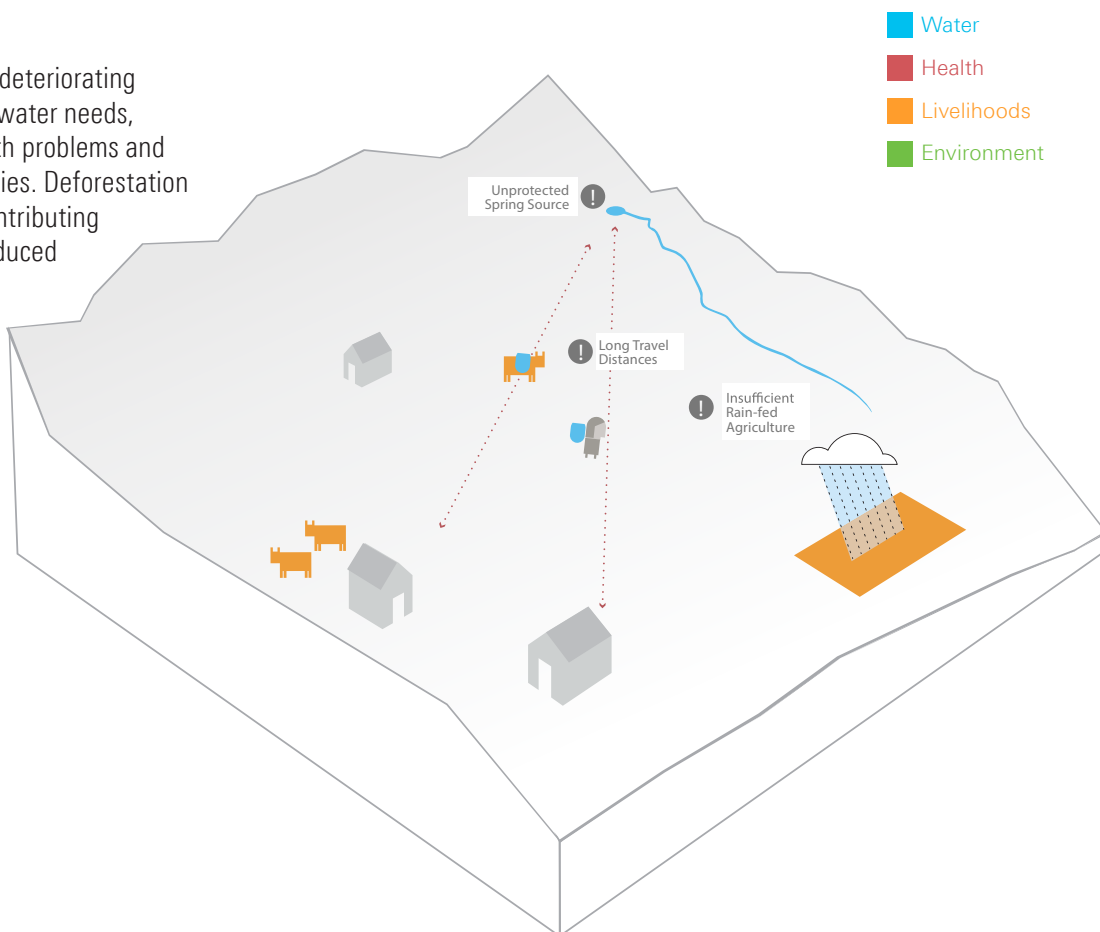


To learn more about how a multiple-use water services approach works for other conditions, see *Section 2, Putting SolutionMUS into Practice*.

1 Example 1 SolutionMUS in Rural Context: Single Source for Multiple Uses

BEFORE

People rely on a distant and deteriorating unprotected spring for their water needs, resulting in a variety of health problems and limited gardening opportunities. Deforestation and land degradation are contributing to poor water quality and reduced infiltration to feed the water source. Long travel times to fetch water are further impeding people's ability to produce food and earn a living.



AFTER

Long-term reliability and quality of the source is enhanced through revegetation and soil conservation in the catchment area. Tap stands installed near households provide adequate potable water and reduce the time required for domestic water collection. Overflow from the drinking water reservoir irrigates off-season vegetable production, generating income to maintain the system, improving food security, and enhancing nutrition.

1 Protected Water Source

2 Village Water Tank

3 Irrigation Water Tank

4 Tap Stand

5 Drip Irrigation

6 Hygiene Promotion

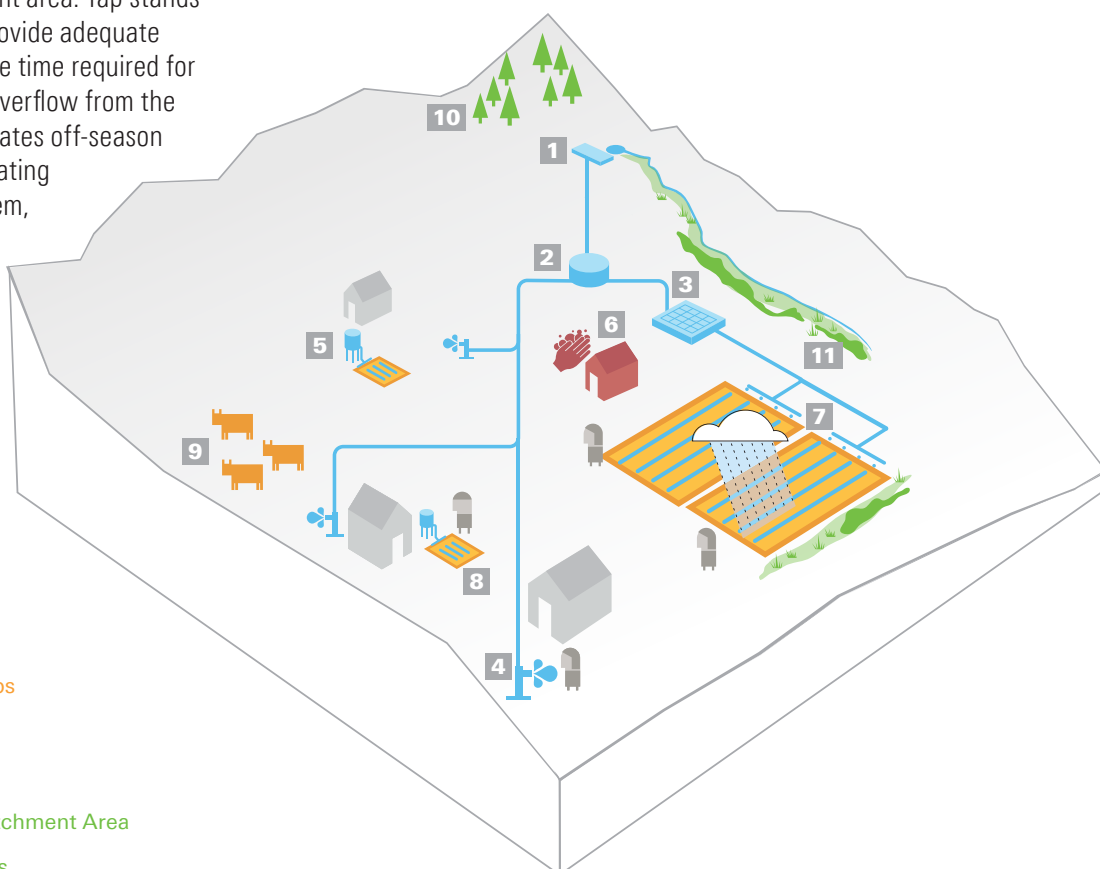
7 Rainfed + Off-Season Crops

8 More Household Gardens

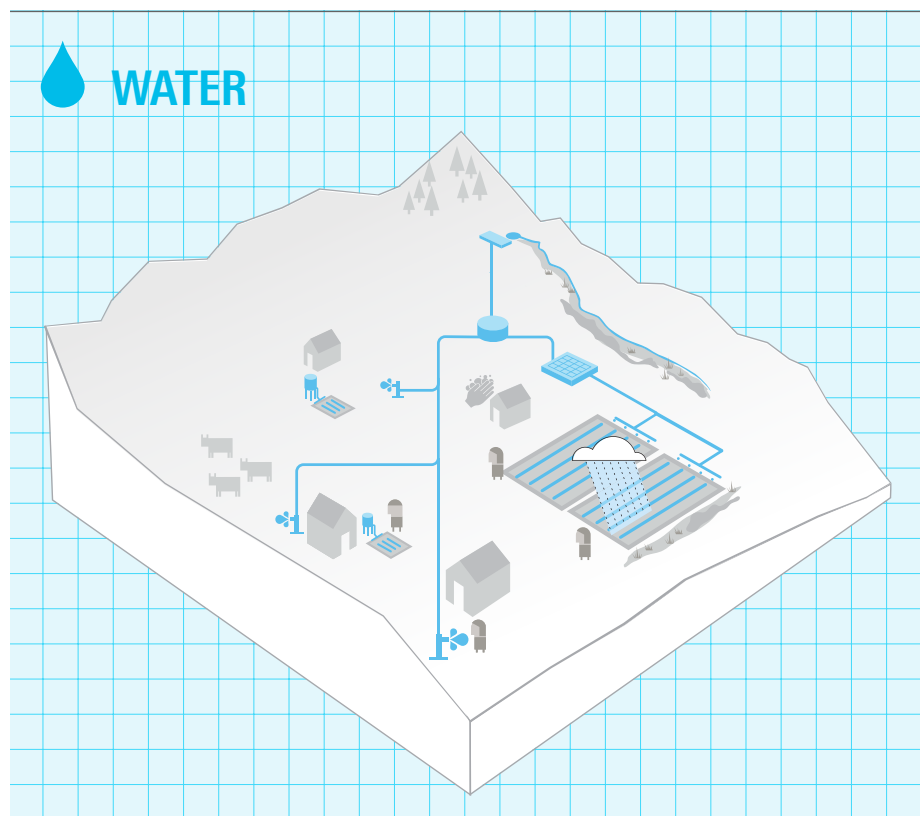
9 Increased Livestock

10 Tree Planting in Spring Catchment Area

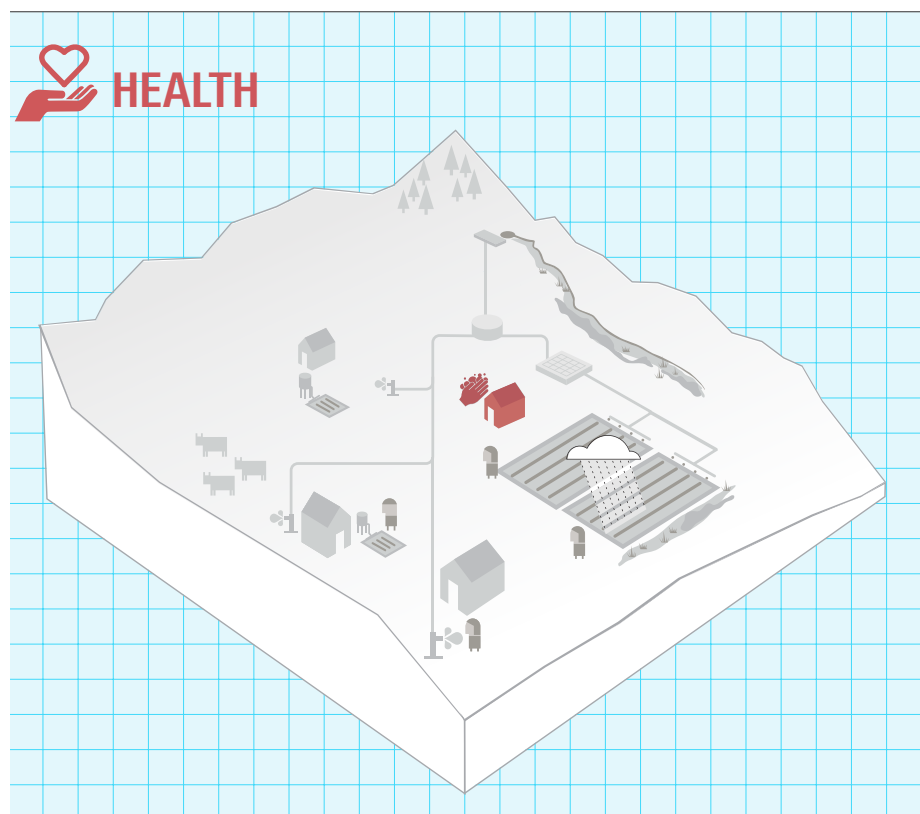
11 Vegetative Riparian Buffers



IN MORE DETAIL

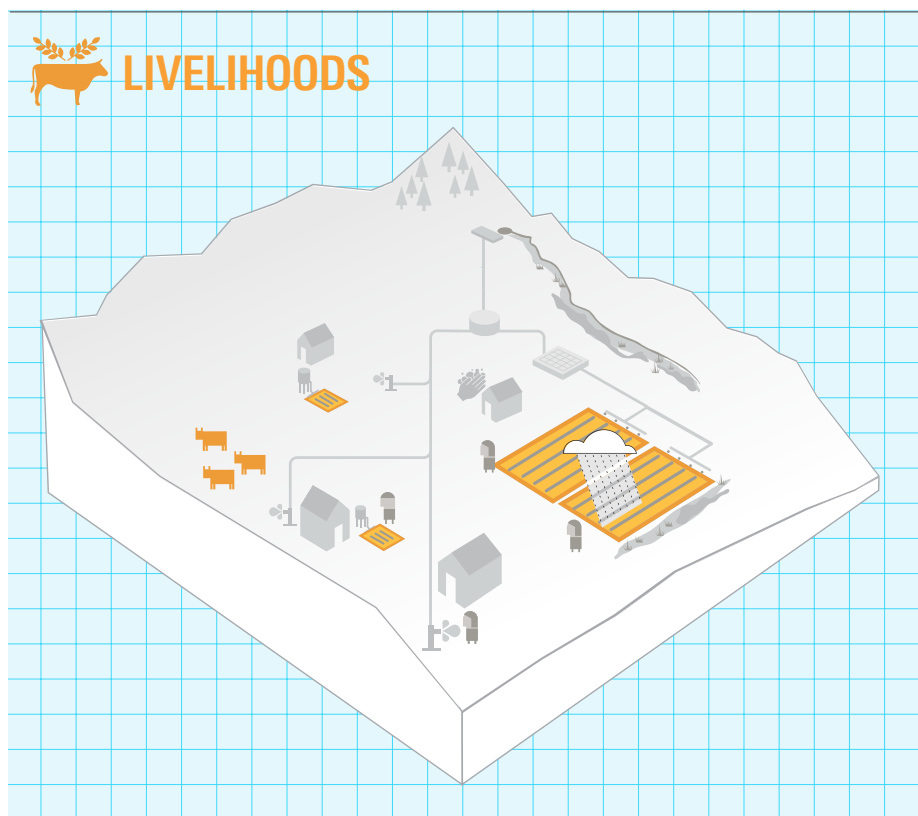


- Protected spring with outlet to a covered reservoir protects drinking water from contamination.
- Tap stands near households greatly increase water availability and reduce time spent fetching water.
- Conflict is reduced by designing water services that meet a range of needs and negotiating water use priorities among stakeholders.
- Increased income from crops, gardening, livestock, and non-timber forestry products is used to maintain system over time.
- Sustainability of water services is enhanced by establishing and training a water management committee.
- Support for local supply chain of replacement parts for gravity system and irrigation technologies makes system more sustainable over time.

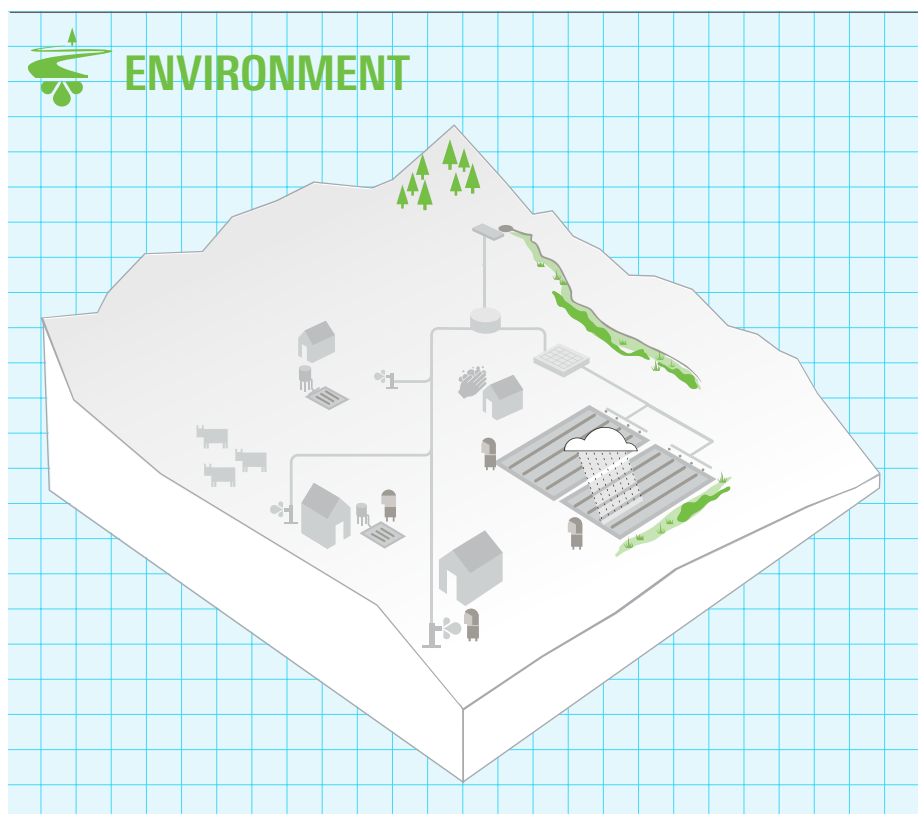


- Potable water, hygiene awareness, and increased handwashing reduce diarrheal disease.
- Increased investment in latrines results from improved water availability, sanitation promotion, and increased income.
- Improved nutrition results from reduced incidence of diarrheal disease and greater consumption of vegetables.

IN MORE DETAIL (CONT.)



- Women's household gardens are converted to high-value crops as a result of increased access to water, drip irrigation kits, agricultural extension, and marketing.
- Off-season water productivity and efficiency in fields is improved through irrigation technologies and agricultural extension.
- Household income and food security are improved.
- Time saved from water collection can now be used for income-generating activities.

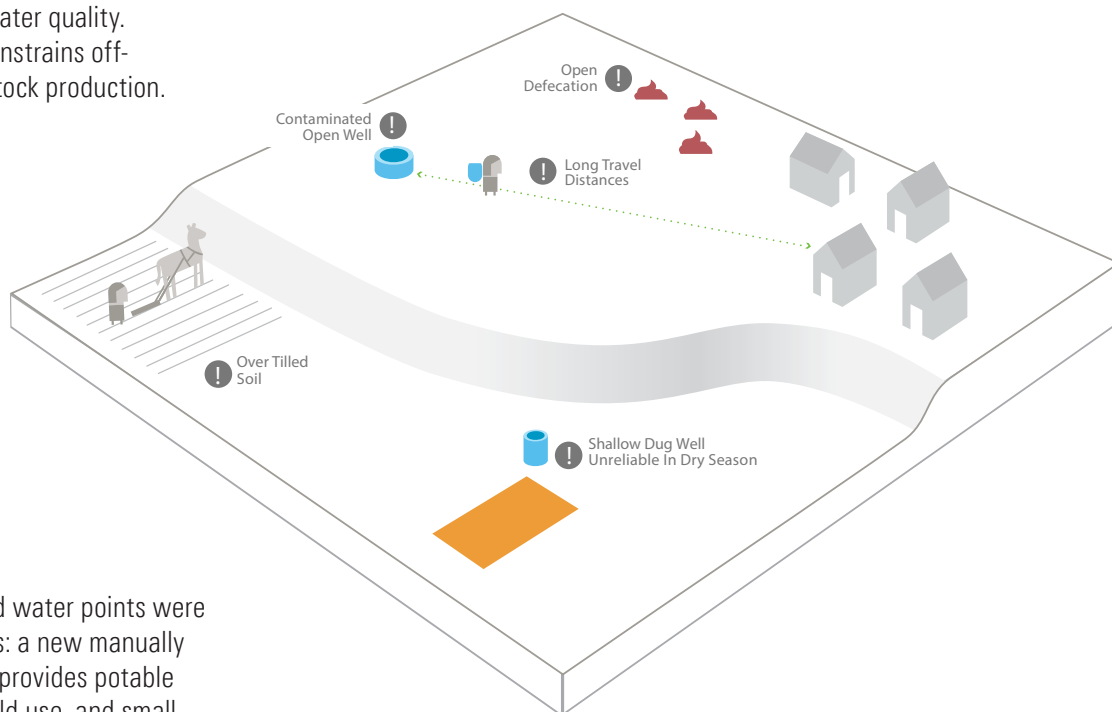


- Environmental impact assessments and climate change studies determine sustainable yield of water sources over time.
- Formal water rights are secured, creating incentives for greater water resource stewardship and ensuring water for environmental flows.
- Tree planting in catchment area improves water quality, stores carbon, and provides income from non-timber forest products.
- Vegetative riparian buffers prevent agricultural runoff into stream, provide habitat, and maintain water quality for ecosystem and downstream users.

1 Example 2 SolutionMUS in Rural Context: Multiple Sources for Multiple Uses

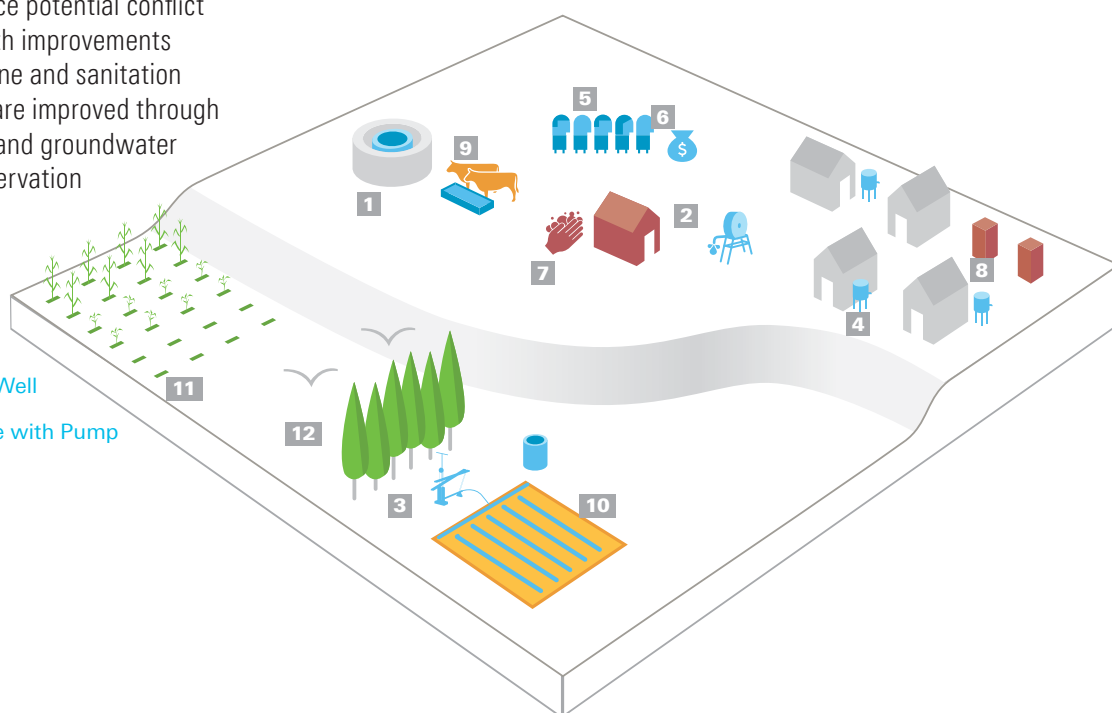
BEFORE

Inadequate and contaminated water is a major problem for this rural community. Poor hygiene and sanitation practices, contamination of open wells by livestock, and over-application of agro-chemicals threaten human health as well as soil and groundwater quality. Insufficient water supply constrains off-season gardening and livestock production.



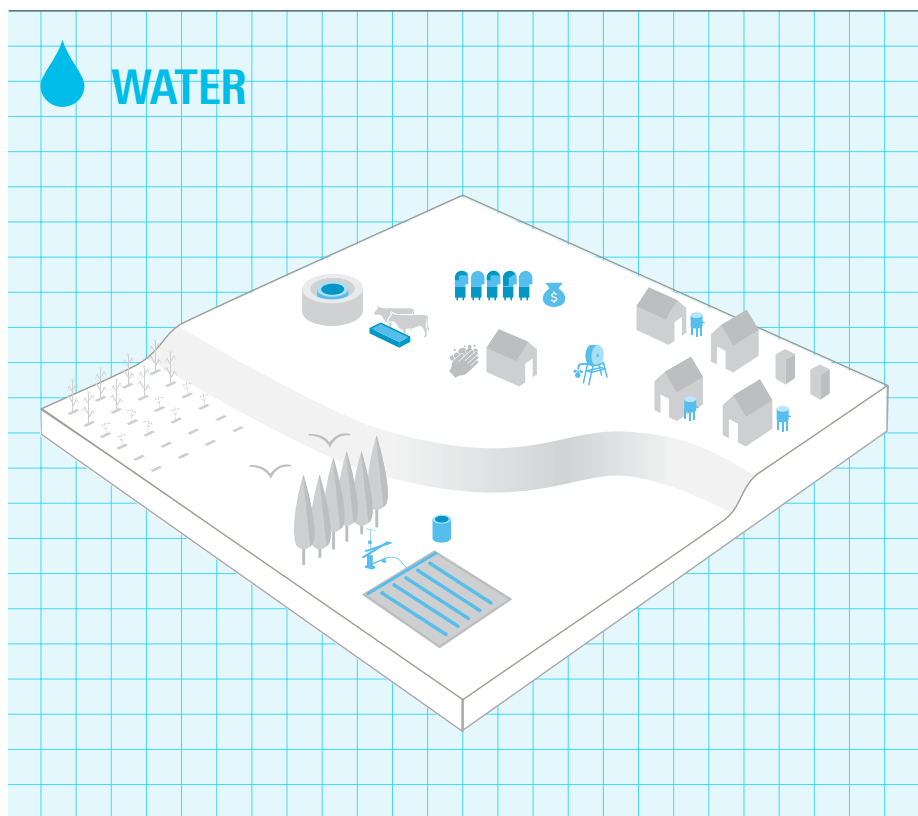
AFTER

Three new and rehabilitated water points were developed for different uses: a new manually drilled borehole with pump provides potable water for drinking, household use, and small livestock; a rehabilitated traditional well serves cattle; and a new garden borehole with pump is used for irrigation. Together, the three water points provide water services that meet community needs and reduce potential conflict between user groups. Health improvements are amplified through hygiene and sanitation promotion, and livelihoods are improved through agricultural extension. Soil and groundwater are protected through conservation farming techniques.

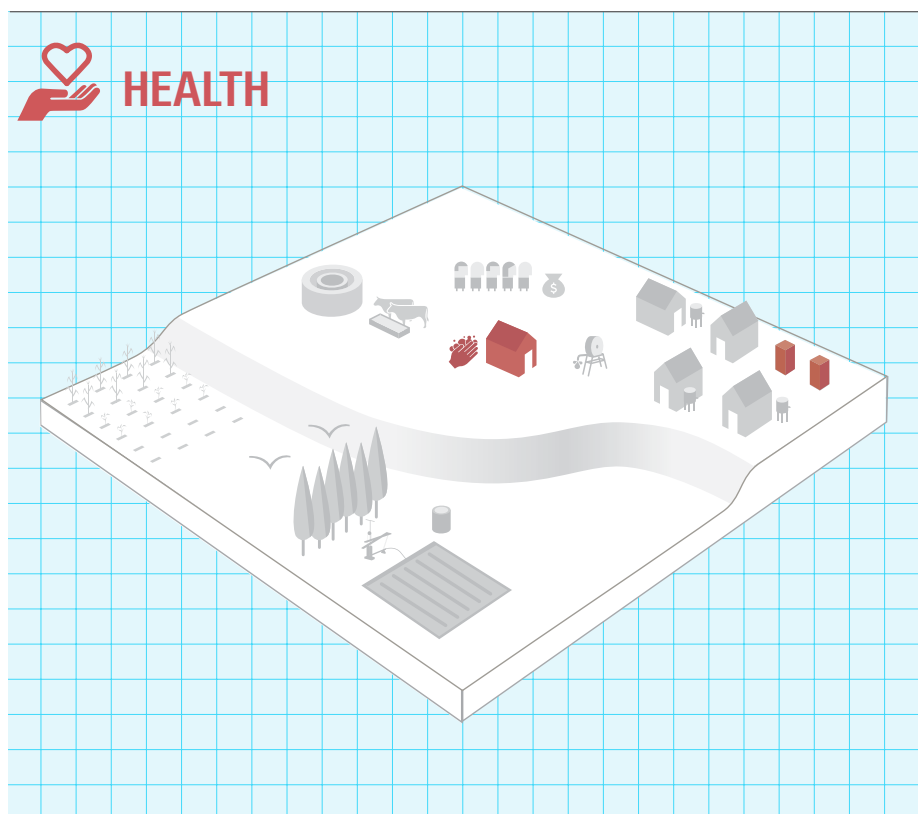


- 1 Rehabilitated Traditional Well
- 2 Manually Drilled Borehole with Pump
- 3 Garden Pump
- 4 Handwashing Station
- 5 Water Committee
- 6 Water Maintenance Fund
- 7 Hygiene Education
- 8 Composting Latrines
- 9 Water Trough for Livestock
- 10 Larger Irrigated Gardens
- 11 Targeted Nutrient Management and Crop Rotation in Low-till Conservation Farming
- 12 Windbreaks with Nitrogen-fixing Trees

IN MORE DETAIL

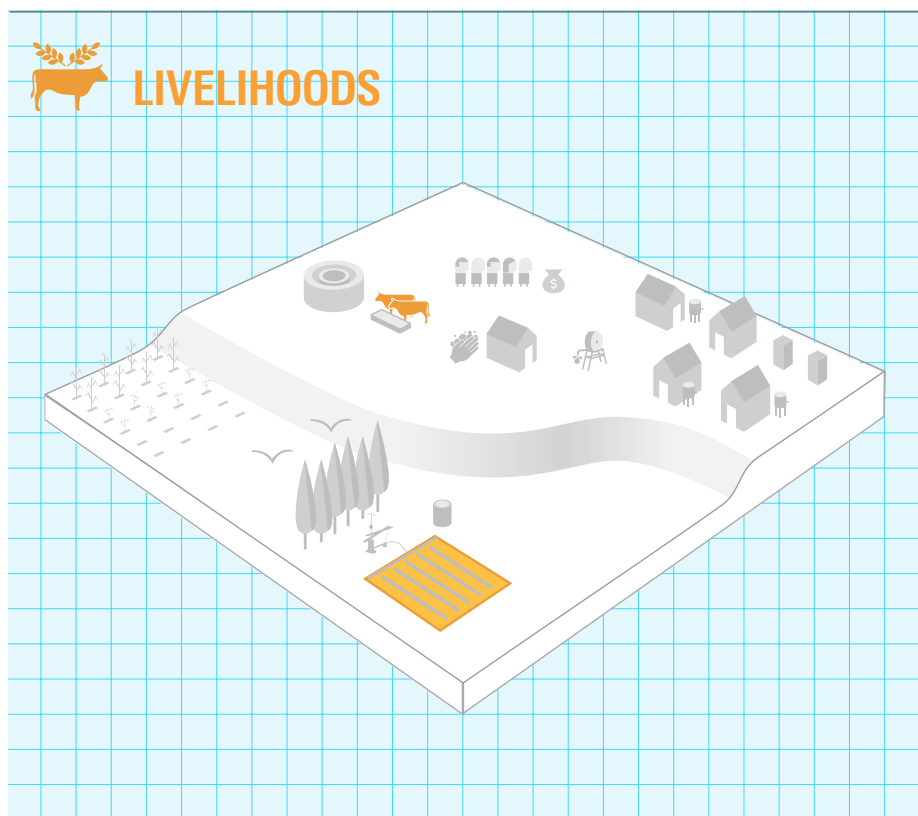


- Manually drilled borehole and pump provides water for drinking, other domestic uses, and small livestock watered at the homestead under the care of women.
- Rehabilitated traditional well provides water for large livestock.
- Small garden pump is installed on manually drilled well.
- A committee is formed to collect user fees, manage and maintain infrastructure and services, and monitor water quality, quantity, and reliability.
- Support is provided for a spare parts supply chain for water pumps.

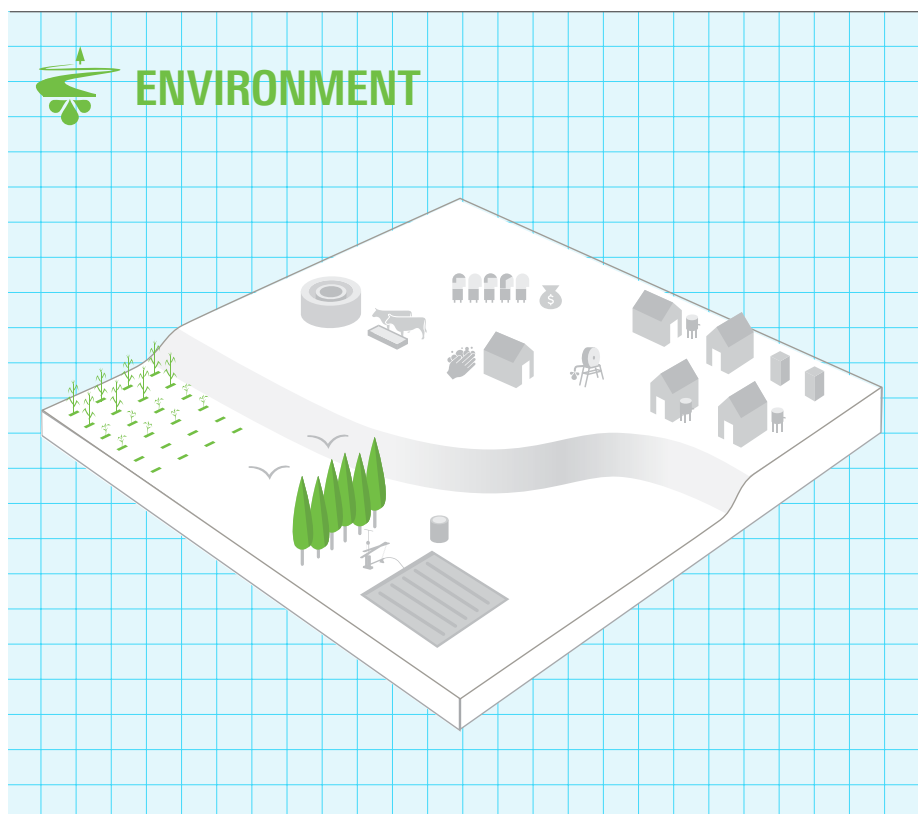


- Hygiene education teaches safe water handling and handwashing at critical times.
- Promotion of handwashing stations increases uptake of improved hygiene practices, further reducing diarrhea and other diseases.
- CLTS and sanitation marketing increases adoption of latrines.
- Nutritional uptake increases due to reduced incidence of diarrhea and more vegetable consumption.

IN MORE DETAIL (CONT.)



- Livestock productivity improves because of increased water access and veterinary services extension.
- Gardens produce more high-value crops because of access to reliable water supply, agricultural extension services, and marketing.
- Incomes and food security increase because of improved garden and livestock production.

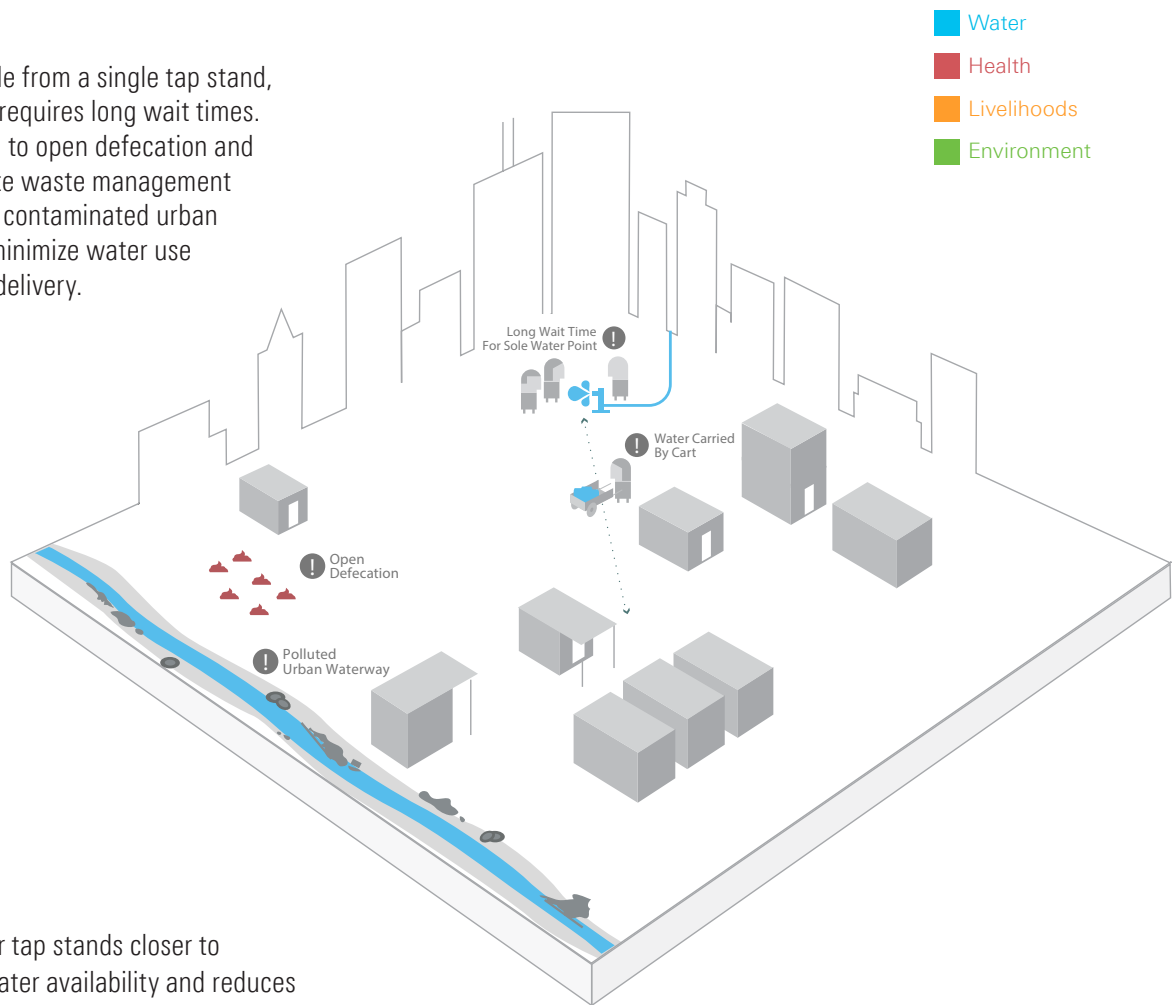


- Properly sited latrines protect water sources from contamination.
- Integrated pest and nutrient management practices in vegetable gardens improve soil health and protect groundwater quality.
- Low-till conservation farming, including targeted nutrient application and crop rotation, maintains soil moisture and nutrient content, enhancing resiliency of rainfed agricultural system to climate and weather shocks.
- Windbreaks with nitrogen-fixing trees protect and enhance soil nutrient content, provide habitat for migratory birds, and reduce water losses through evapotranspiration.

1 Example 3 SolutionMUS in Urban Context: Multiple Sources for Multiple Uses

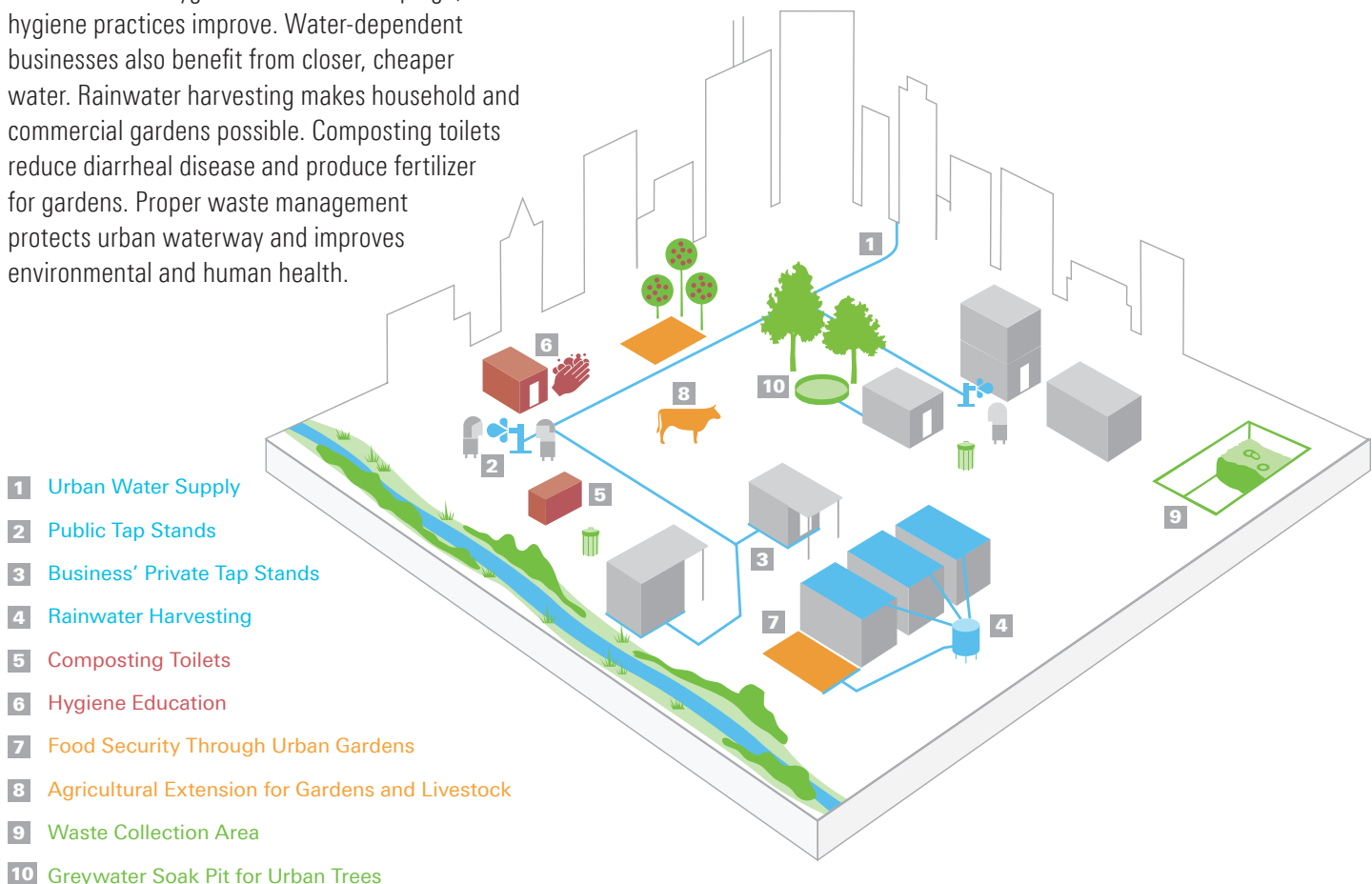
BEFORE

Potable water is available from a single tap stand, but is distant and often requires long wait times. Diarrhea is common due to open defecation and poor hygiene. Inadequate waste management results in a clogged and contaminated urban waterway. Businesses minimize water use because of the cost for delivery.

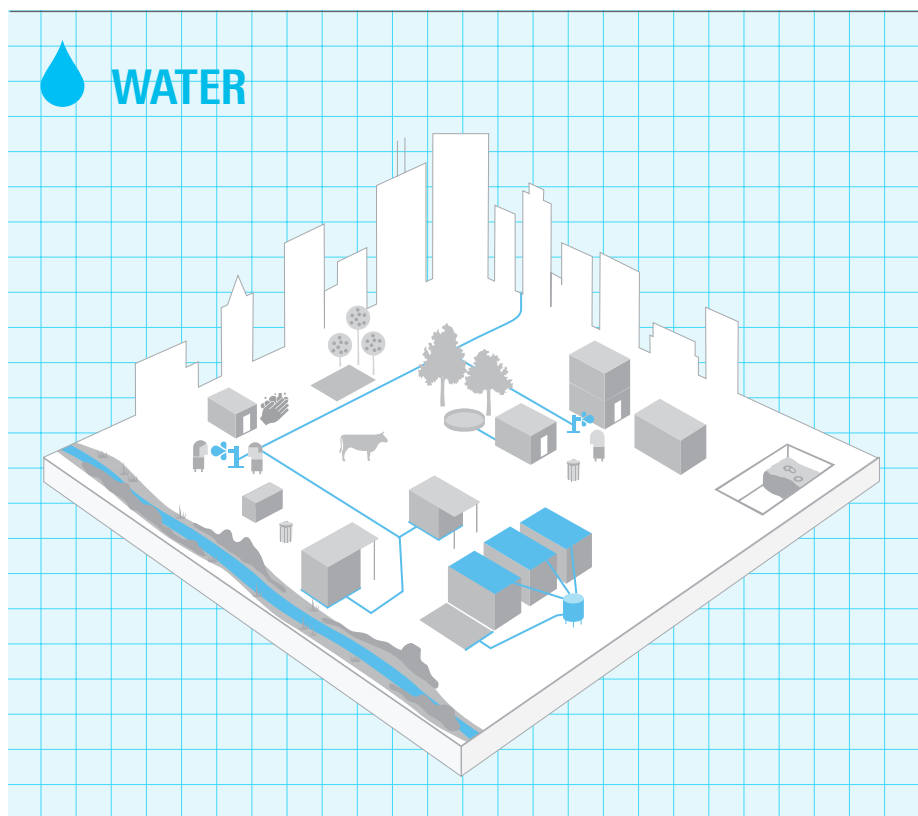


AFTER

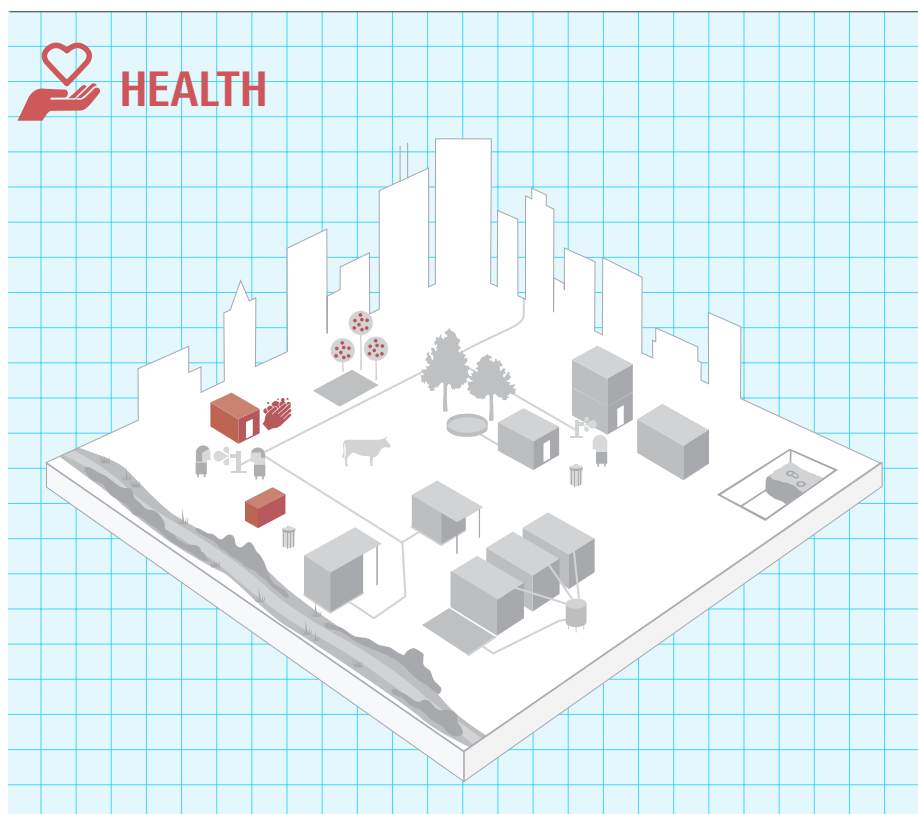
Extending potable water tap stands closer to households increases water availability and reduces the cost of transporting water. With more water available and a hygiene education campaign, hygiene practices improve. Water-dependent businesses also benefit from closer, cheaper water. Rainwater harvesting makes household and commercial gardens possible. Composting toilets reduce diarrheal disease and produce fertilizer for gardens. Proper waste management protects urban waterway and improves environmental and human health.



IN MORE DETAIL

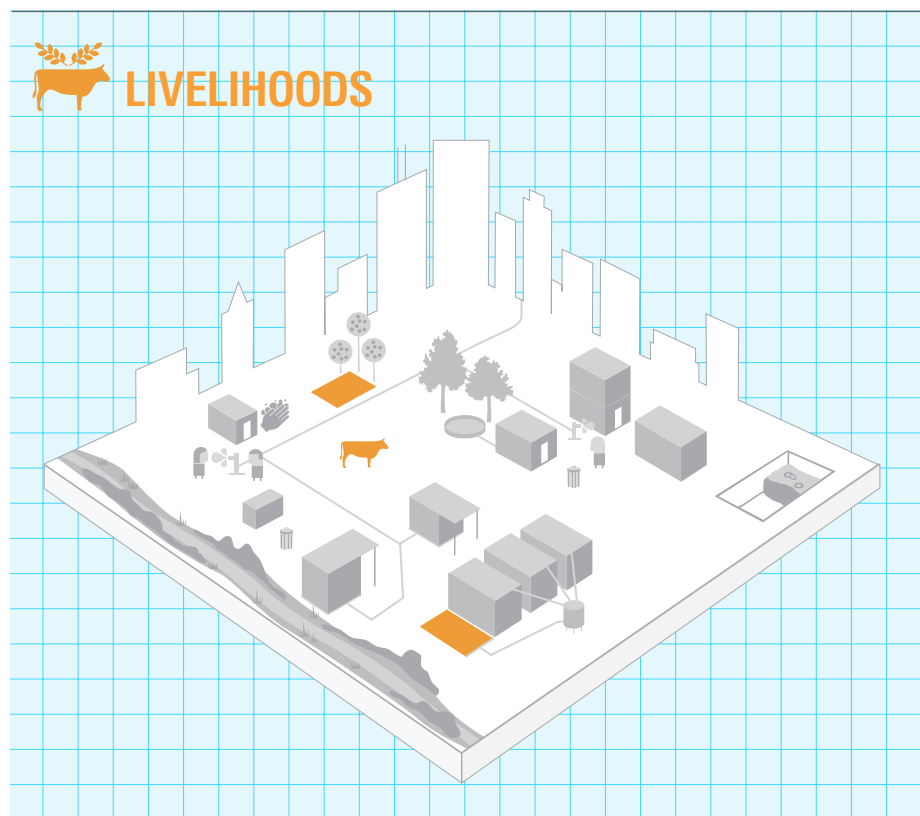


- Extending more public tap stands close to households increases access to sufficient quantities of potable water and reduces the time women and children spend collecting and transporting water.
- Some businesses, such as restaurants and laundries, purchase private taps, enhancing sustainability of water services.
- Rainwater harvesting provides convenient, lower-cost water for household and commercial gardens.
- Income from gardens enables expansion of rainwater harvesting.
- Demand-side water management, supported through fee structures and public education, increases water use efficiency.
- Fair and effective fee structures ensure the financial health of services while encouraging efficient and sustainable water use by consumers.



- Handwashing education reduces diarrheal and respiratory diseases.
- Sanitation promotion discourages open defecation and promotes latrine use.
- Urban tree planting provides shade and protects urban waterway from pollutants and solid waste.
- Proper waste disposal and a cleaner urban waterway reduce disease-carrying vectors and water-borne illnesses.
- Improved nutritional uptake results from a reduced incidence of diarrhea and increased vegetable consumption.

IN MORE DETAIL (CONT.)



- Income generation from high-value gardening increases because of more reliable water supply from rainwater tanks and support from agricultural extension programs.
- Fertilizer from composting toilets makes gardens more productive.
- Water-dependent businesses experience increased income as a result of greater quantity and reliability of water supply.
- Intercropping fruit and fodder trees among horticultural fields leads to increased income, improved air quality, and more shade.



- Improved solid waste collection and disposal reduce contamination of the urban waterway and protect water quality in downstream rivers, estuaries and ocean.
- Greywater soak pits irrigate urban trees that provide wildlife habitat and increase infiltration during high rainfall events.
- Composting and wastewater reuse create economic value from sanitation waste.



*Putting
Solution MUS
into Practice*

INTRODUCTION

Interested in implementing SolutionMUS?

This section explains the process for putting SolutionMUS into practice. The approach is broken into three phases:

1



PLANNING

Begin with a general, participatory assessment of water demands and supplies. Look at demand for water across all uses, current water services, and the attributes of available water sources. At the same time, assess hygiene practices, water-related livelihood activities, and environmental considerations. Keep in mind government policies and programs of other organizations.

2



IMPLEMENTATION

Put the integrated plan into action. Implementation involves installing or upgrading water technologies, securing sustainable financing to cover capital and operating costs, training people to manage and maintain the water sources and technologies, supporting spare parts supply chains, ensuring environmental sustainability, and amplifying the health, livelihoods, and environmental benefits of water services through complementary activities.

3

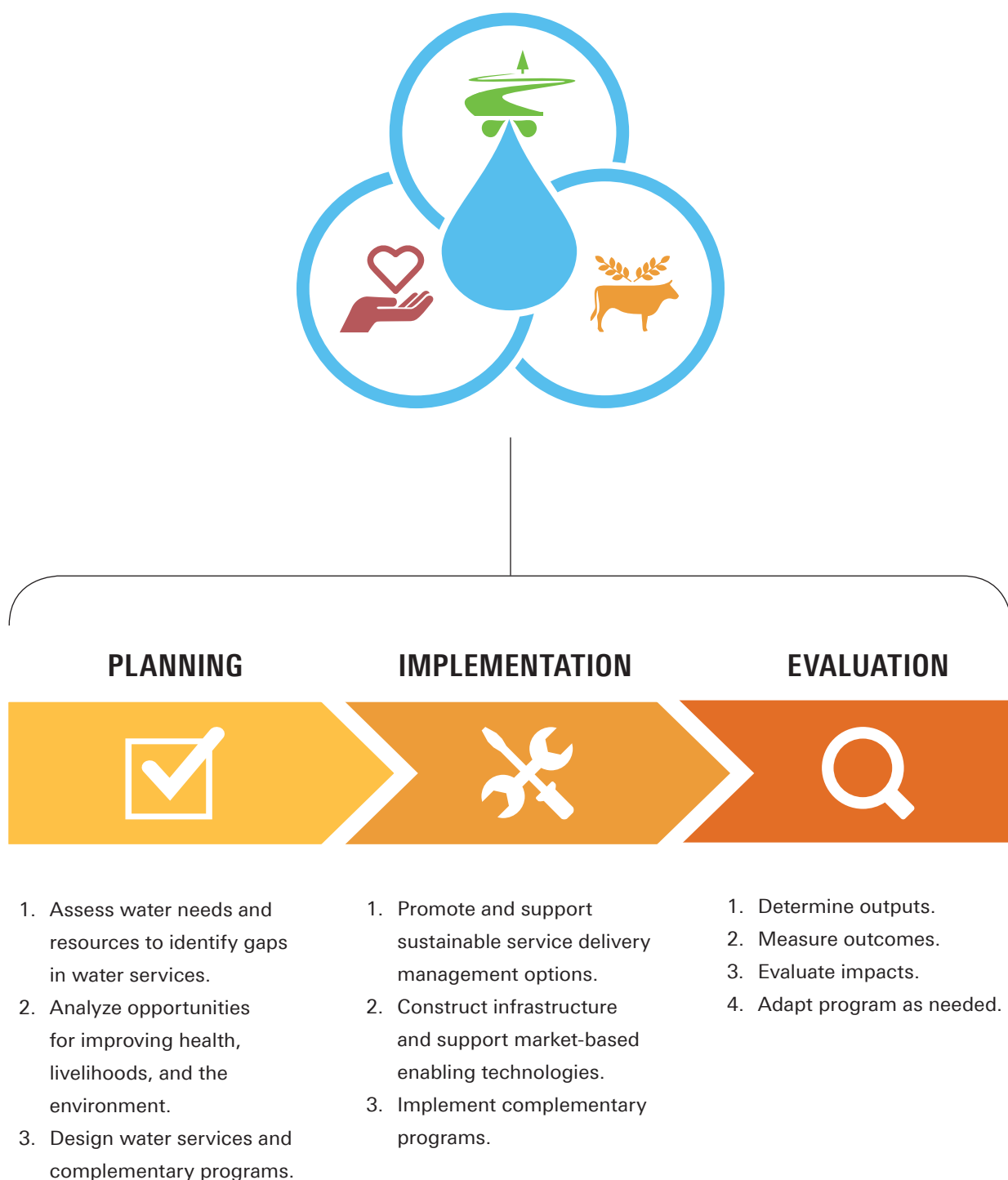


EVALUATION

Measure the project's impact. After implementation, undertake a holistic evaluation to learn from the successes and the failures of the project. Engage the water users and other stakeholders in this process. Use the results of the evaluation to correct weaknesses and improve sustainability.

HOW IT WORKS

Here is a visual overview of SolutionMUS in the program cycle and the key activities in each phase.

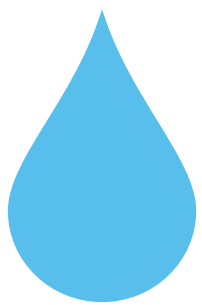




PLANNING: ASSESSMENT

An assessment helps you determine the appropriate water services to meet people's needs.

Here are some key considerations:



ASSESSING WATER

The process involves two key elements: assessing people's needs and desires, and assessing the water sources. Below is a sampling of questions to be asked in this phase.



PEOPLE

- Who uses the water?
- What do they use the water for?
- How much water do they need?
- What quality of water do they need?
- Where do they use water?
- Are there any conflicts around water, either inside the community or with others in the catchment?
- Are the water uses going to change?
- Are water users part of a cohesive community?
- Do they have social and financial resources to maintain water systems?



SOURCES

- What types of sources are available?
- How far away is each source?
- What quality of water is produced by each source, and what potential contamination threats exist?
- How much water can be used sustainably throughout the year, and over many years in a changing climate?
- Who controls the water and land rights around the source?



ASSESSING HEALTH, LIVELIHOODS, & ENVIRONMENT

Under SolutionMUS you can expand the impact of multiple-use water services on people's lives through complementary health, livelihood, and environmental activities. You can tailor the activities to fit the context and available time and resources.

To understand what activities are needed and desired, assess the current conditions and future potential in these areas. Use the following sample questions to guide your assessment.



HEALTH

- What are the current hygiene practices?
- What are the current sanitation behaviors?
- What are the current nutrition practices?
- What hygiene and sanitation practices can reduce diarrhea and increase nutrient absorption?
- What resources are available for health activities?
- What prevents people from improving their hygiene, sanitation, and nutrition?



LIVELIHOODS

- What are the main crops produced?
- What are the primary livestock products?
- What are the most common water-dependent businesses?
- What resources are available for livelihoods activities?
- What prevents the various livelihoods activities from expanding?



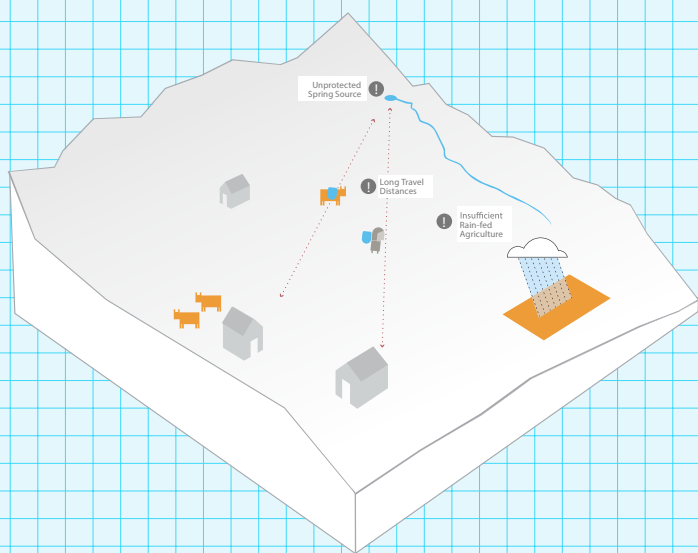
ENVIRONMENT

- What are the environmental risks of current domestic and productive uses of water, both within the community and in the entire catchment area?
- Can protection improve water source quality?
- What financial and human resources are available for environmental activities?
- What prevents people from protecting the sustainability of water resources within the community and the catchment area?



EXAMPLE

Here are some findings from the Assessment process in Example 1.



WATER

PEOPLE

- Water is used for drinking, cooking, bathing, cleaning, gardening, and maintaining livestock.
- People need more water for off-season gardening.
- The community is cohesive and capable of managing shared infrastructure.

SOURCE

- The only source is an unprotected spring.
- The unprotected spring is 2 hours away from the village, and used by other communities upstream and downstream.
- Watershed protection could increase the quality of water in the spring.

HEALTH

- The community lacks basic knowledge about how diseases spread.
- There is limited use of existing latrines.
- There is poor nutrition.

LIVELIHOODS

- Crops aren't grown during dry season because of inadequate irrigation, market links, and skills.
- Every household has a goat, but people want additional livestock for income.
- There are no water-dependent businesses.

ENVIRONMENT

- The spring and catchment area are inadequately protected.
- Deforestation in the spring catchment area degrades the reliability, quantity and quality of the water source and threatens important habitat.
- Agricultural runoff during flooding threatens downstream water quality.



PLANNING: DESIGN

What does SolutionMUS look like?

Once you understand the people, their needs and desires, and the sources, you can design an integrated water service with supporting health, livelihood, and environment components. How do you choose on the right combination of technologies and management programs?

AS YOU DESIGN, IT'S HELPFUL TO MAKE SURE THAT YOUR SOLUTIONS ARE:

- **Desirable** – Is it what people want?
- **Feasible** – Is it technically, environmentally, and organizationally realistic to implement?
- **Viable** – Is it financially sustainable for people and for your organization?

With SolutionMUS, you get a unique framework for developing these services. The following pages show some key components of that framework:*



DESIGN WATER
SERVICES



DESIGN HEALTH
ACTIVITIES



DESIGN LIVELIHOODS
ACTIVITIES



DESIGN ENVIRONMENT
ACTIVITIES



SolutionMUS isn't an all or nothing approach. All services and activities don't have to be implemented at once. Prioritize based on needs, resources and capacity. Develop a timeline for implementation as part of the design process.



DESIGN WATER SERVICES

How do you choose the right combination of technologies and supporting programs?

Multiple-use water services are not about repeating the same technology throughout a community. Choosing the right technology for each use is an important part of creating successful and sustainable water services. Equally important are involving all water user groups in the planning phase and helping them choose support programs (governance, management, and training) that will enable long-term sustainability of the water services.

Use the results of the Assessment process for insights on how to create a more equitable and effective project. Understand what people want, what the water sources can sustainably provide, and what people are able to manage over the long term.

Here is a basic overview of some of the most important considerations that factor into designing water services:

WATER SERVICES OVERVIEW

	ENABLING TECHNOLOGY	SUPPORT PROGRAMS
Withdrawal	Spring box River or lake intake Borehole Manually drilled well Hand-dug well Rainwater harvesting system	Support creation of management and financing structures.
Lifting	Hand pump Treadle pump Motorized pump Windmill	Implement management training programs.
Storage	Catchment pond Trough Tank Reservoir Aquifer recharge	Incentivize development, adoption, and scaling up of innovative and appropriate water services technologies and approaches.
Distribution	Pipes Canals Ditches	Provide technical training for installation, operation and repair of infrastructure, and for watershed protection.
Treatment	Filter UV Chemical	Ensure connection to spare parts suppliers.

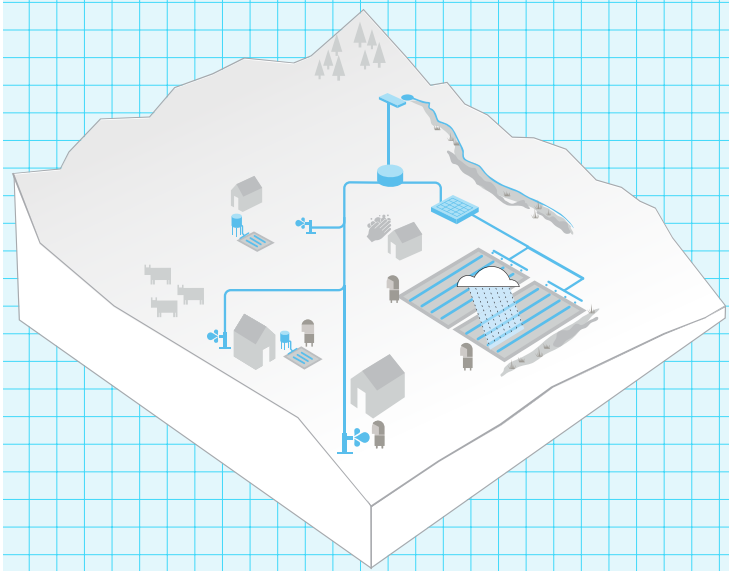


💧 DESIGN WATER SERVICES (CONT.)

A key element of support programs is management. Work with water users to design a management structure that takes into account their resources and constraints. Some options for a management structure are community (decision-making and oversight by committee, with paid technical operators) or private (management authority and technical operation by an individual, household, small group, or private entrepreneur).

EXAMPLE

Here are some of the Water Services designed into Example 1



SOURCE

- Spring source intake is covered to protect water quality from contamination.

STORAGE

- A covered tank stores water downstream to increase quantity and reliability. This helps keep it free from contamination for activities such as drinking, bathing, and watering small animals and gardens. An uncovered tank captures overflow water for use in fields during the dry season.

DISTRIBUTION

- Separate pipes deliver water from storage tanks to the tap stands near people's homes and the fields, helping reduce conflict between domestic and productive uses.

LIFTING

- No lifting required in this example (gravity scheme).

TREATMENT

- With protection, water from the spring is potable, so no additional treatment is needed.

MANAGEMENT

- The community has created a management committee to maintain system infrastructure, oversee finances, and manage allocation of water among users.
- Local retailers are connected to spare parts wholesale suppliers to ensure availability of parts, and to make maintenance and repairs cost-effective.






DESIGN HEALTH ACTIVITIES

How do you improve people's health?

By providing only potable water, you can make a health impact. To the extent that project resources permit, designing additional Health Activities (hygiene, sanitation, and nutrition) can maximize the overall health impacts of the new water service. Information learned in the Assessment process along with the results from the Design of Water Services can inform the selection of Health Activities to include in the project.

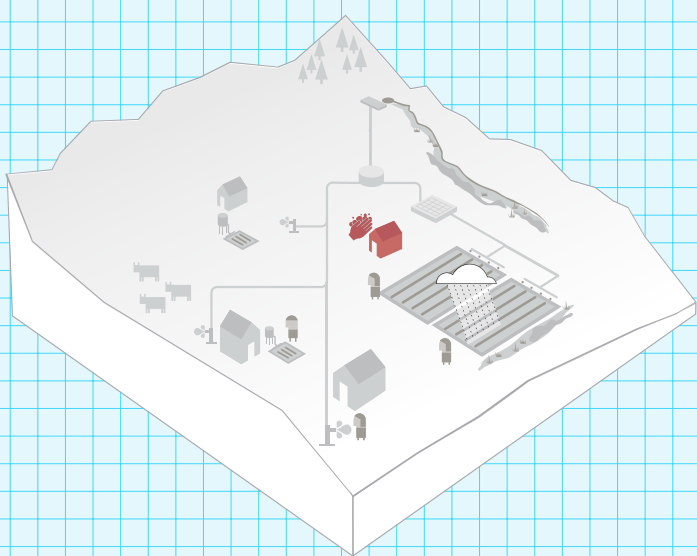
Here is an overview of some of the support programs and enabling technologies to consider when designing Health Activities:

HEALTH ACTIVITIES OVERVIEW

	SUPPORT PROGRAMS	ENABLING TECHNOLOGY
 Hygiene	Safe water handling training Hygiene education and promotion	Point-of-use drinking water treatment Handwashing stations
 Sanitation	Sanitation promotion Sanitation education	Latrines Composting toilets
 Nutrition	Nutrition education Targeted nutrition programs for mothers and children under age 5	Food pyramids showing nutritional needs of children and childbearing mothers

EXAMPLE

Here are some of the Health Activities designed into Example 1



HYGIENE

- A hygiene behavior change program can reduce illnesses.

SANITATION

- Latrine installation and their consistent use can be increased through a sanitation marketing program.

NUTRITION

- Integrated hygiene and nutrition programs can improve nutritional status by reducing diarrheal disease and increasing the availability and variety of foods produced through household gardening.



DESIGN LIVELIHOODS ACTIVITIES




How do you increase people's incomes, food security, and resilience?

Simply by providing holistic water services, you can improve livelihoods. To the extent that project resources permit, designing additional Livelihoods Activities (crops, livestock, enterprises) can broaden the impact of your project by increasing incomes, improving food security, and enhancing resiliency.

Information learned in the Assessment process along with the results from the Design of Water Services can inform which livelihoods activities to include in the project.

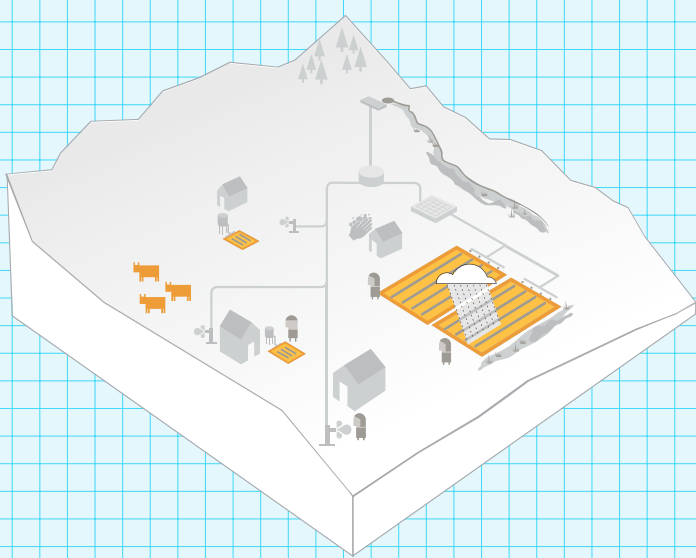
Here is an overview of some of the support programs and their enabling technologies to consider when designing Livelihoods Activities:

LIVELIHOODS ACTIVITIES OVERVIEW

	SUPPORT PROGRAMS	ENABLING TECHNOLOGY
 Crops	Agricultural extension Market linkages Inputs supply chain	Improved seeds Irrigation equipment Greenhouses
 Livestock	Livestock extension Market linkages Inputs supply chain	Veterinary supplies Production facilities Safe storage and transport of products
 Enterprise	Entrepreneurship training Market linkages Skills training	Food processing equipment Brick-making equipment Laundry stations

EXAMPLE

Here are some of the Livelihoods Activities designed into Example 1



CROPS

- Agriculture extension services help improve the production of high value crops.
- Sprinklers, drip kits, and greenhouses help farmers use water and fertilizer more efficiently.
- Collection centers help producers from rural communities bring their produce to market.

LIVESTOCK

- Training in fodder production helps increase goat production.
- Livestock extension services promote better feeding, shelter, and disease prevention.



DESIGN ENVIRONMENT ACTIVITIES




How do you ensure environmental sustainability?

You can support the sustainability of water resources by ensuring that human water consumption does not exceed the rate of natural replenishment, environmental flows are maintained, and downstream users are taken into account. To the extent that project resources permit, designing complementary Environment Activities can enhance environmental sustainability by building

awareness and stewardship of water resources at the catchment level, protecting habitat and ecosystems, managing waste, and treating wastewater. These activities should be informed by environmental impact assessments and climate vulnerability analyses.

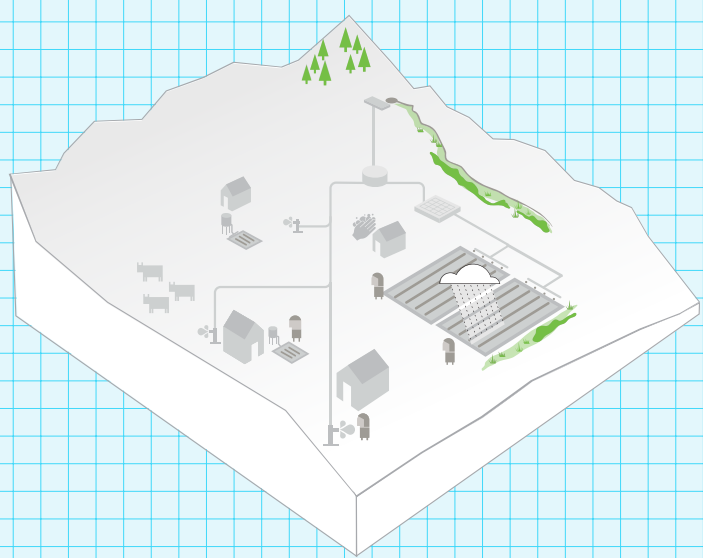
Here is an overview of some of the support programs and enabling technologies to consider when designing Environment Activities:

ENVIRONMENT ACTIVITIES OVERVIEW

	SUPPORT PROGRAMS	ENABLING TECHNOLOGY
 Water Resource Management	Outreach and education Training on water resources governance Environmental impact assessment Climate vulnerability assessment	Water quality testing kits Flow meters Geospatial mapping
 Ecosystem Management	School environment clubs Participatory land use planning Biodiversity hotspot protection	Natural flood plain and wetland protection Vegetative riparian buffers
 Waste Management	Soil and ground water protection Wastewater treatment Solid waste management	Garbage containers Integrated pest and nutrient management techniques Physical and chemical water treatment technologies

EXAMPLE

Here are some of the Environment Activities designed into Example 1



WATER RESOURCE MANAGEMENT

- Effective participation in catchment-scale water governance, and stakeholder education about water rights enhance community stewardship of shared water.
- Training encourages adoption of revegetation and soil conservation practices in the upstream catchment area to improve infiltration and retention of rainfall.
- Environmental impact assessments, demographic projections, and climate change forecasts determine the sustainable yield from the mountain spring.

ECOSYSTEM MANAGEMENT

- Tree planting in the catchment area stores carbon and provides habitat.

WASTE MANAGEMENT

- Downstream water quality is protected from livestock contamination and agricultural runoff by vegetative riparian buffers and land use planning.



IMPLEMENTATION

The goal of implementation is to bring the infrastructure and supporting programs designed in the planning phase to life.

Implementers face constraints. For example, inadequate organizational capacity, technical expertise, or funding can make it difficult to move forward with all aspects of a project at once. Accordingly, interventions should be prioritized and implemented on the basis of established needs, resources, and capacity.

Implementation methods can vary widely from organization to organization, yet a number of best practices are common to most approaches. Some of these are listed on the following page.



BEST PRACTICES FOR IMPLEMENTATION



SUPPORT PROGRAMS

- Establish clear roles and responsibilities among stakeholders. Consider a formal written or oral agreement in the presence of all stakeholders.
- Encourage participation of all water user groups in the assessment and design process. Ensure a wide range of stakeholders are taken into account, including men, women, young, old, landless people, agriculturalists, herders, business owners, upstream and downstream users, and other relevant user groups.
- Require people to contribute time, money, or other resources before construction to demonstrate local commitment. Assist people to evaluate trade-offs and the cost-benefit of different technical alternatives so they can choose what is most affordable and appropriate.
- Reinforce the local supply chains. Develop and strengthen existing business relationships and social networks to reinforce the local supply chains for parts and repair services.
- Enable local maintenance so projects are sustainable over time. Provide follow-up training for technicians and entrepreneurs a few months after implementation.
- Provide substantial post-construction follow-up support. Deliver at least 1 year of intensive follow-up and 2 years of less-intensive follow-up that guides, but doesn't finance, water users as they work through maintenance, repairs, and management issues.



- Start small. Prioritize easily implementable health promotion activities such as handwashing with soap at critical moments, safe handling of water and food, and latrine use.
- Know your target audience. Maximize impact by developing audience-specific training and promotional activities.
- Use positive messaging. Keep people entertained and focused through positive training and behavior change promotion.

ENABLING TECHNOLOGY

- Let the community make the final decision on technical options. Show a range of technical options to people so they can choose an appropriate cost and service level, and feel ownership over the infrastructure.
- Ensure careful attention to environmental protection requirements in the construction of infrastructure. Develop a water sources protection management plan to improve quantity, reliability, and quality of the water supply.
- Identify opportunities to improve the service. Talk with people about ways in which they can upgrade or expand the service over time.



BEST PRACTICES FOR IMPLEMENTATION (CONT.)



SUPPORT PROGRAMS

- **Showcase existing projects.** Expose people to the benefits of livelihood-related activities by organizing field trips to observe activities already in place.
- **Build local extension capacity.** Provide extension training to businesses and entrepreneurs, enabling them to provide goods and services to the local community.



- **Strengthen environmental governance.** Build awareness of environmental stewardship benefits and promote equitable and sustainable allocation of water among stakeholders at the basin scale through appropriate traditional and formal structures.
- **Facilitate a local exchange visit with representative group of stakeholders.** Help people see connections between activities and environmental impacts through local exchange visits.
- **Follow the principle of do no harm.** Conduct environmental impact assessments that begin with a simple checklist identifying possible impacts from activities. Prepare and implement a mitigation plan to address those impacts.

ENABLING TECHNOLOGY

- **Promote rather than subsidize.** Encourage the development of market-driven local supply chains so that technologies, services, and replacement parts are readily available.
- **Invest in sustainable water resources management.** Ensure that community water user fees include sufficient resources to protect water sources and promote climate change resilience.
- **Give people choices.** Introduce a range of environmental protection techniques so that people can choose which options are the most appropriate and cost-effective.
- **Engage in participatory decision-making.** Use best practices of water resources planning and governance to engage stakeholders throughout the catchment area in both mapping and considering the environmental impacts of water services.



EVALUATION

How do you measure impact?

Evaluation provides evidence of your project's impact and identifies opportunities for improvement and adaptive management (modifications to project activities based on what is learned from the evaluation). Be sure to develop clear, measurable indicators for each evaluation component, and use a system to track progress at defined points during and after program implementation.

SolutionMUS recommends an evaluation framework that focuses on three components:

1

OUTPUTS

What was delivered?

The short-term goods or services directly produced by project activities.

2

OUTCOMES

What are the observed effects of the goods and services delivered?

The medium-term results flowing from combined project outputs.

3

IMPACTS

What are the overall results?

The long-term benefits produced by project outputs and outcomes.



KEY CONSIDERATIONS FOR EVALUATION

OUTPUTS

OUTCOMES

IMPACTS



- What water infrastructure has been installed?
- What training and management components have been implemented?

- Are people using the technology appropriately?
- Is the management committee working well?

- Have conflicts decreased?
- Are the water services more equitable between user groups?



- What benefit-enhancing health activities have been implemented?

- How have hygiene practices changed?
- Are there any differences in sanitation practices?

- Has people's health status improved?
- Have the rates of water-related disease decreased?



- What impact-amplifying livelihoods activities have been implemented?

- Are more people using water resources more efficiently to support increased livelihood activities?
- Have people gained new knowledge and skills that improve livelihoods?

- Have people's incomes increased?
- Are livelihoods more resilient to climatic change?



- What benefit-enhancing environment activities have been implemented?

- Are protections in place to prevent water contamination?
- Are people demonstrating stewardship of their water resources?

- Are the sources more reliable?
- Have environmental water flows been maintained?
- Does water quality meet standards?

INTEGRATED IMPACTS



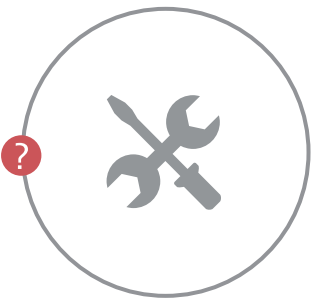
- What is the return on investment of all combined services and benefit-enhancing activities (e.g. increased incomes, improved health, and sustainable environmental services)?
- Are water services for multiple uses delivered more sustainably, from a technical, financial, and environmental perspective?
- Is there an increase in community and household assets and capacity to adapt to climatic, political, or economic shocks?
- Does the community demonstrate improved governance and participation in other areas of community life?
- Are marginalized populations more engaged?

A large, white, stylized number '3' is centered on a solid blue background. The number is composed of two thick, curved strokes. The top stroke starts at the top left, curves around to the right, and then down to the middle. The bottom stroke starts at the middle, curves around to the right, and then down to the bottom left. The text 'How to Start' is written in a dark blue, italicized serif font, positioned horizontally across the middle of the number '3'.

How to Start

WHAT SOLUTIONMUS MEANS FOR YOU.

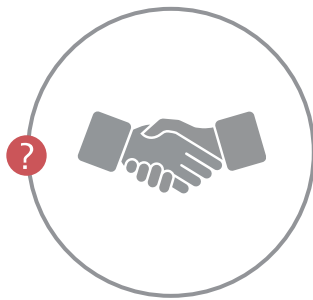
Whether you are an implementer, funder, policy maker, or researcher, you will experience benefits from adopting the SolutionMUS methodology. The next few pages will help get you started. Remember that SolutionMUS isn't an all or nothing approach. You can decide how far you want to go and at what pace. You don't have to do everything all at once.



ARE YOU AN IMPLEMENTER?

Deepen your impact.

Think holistically to see how water can extend impacts across health, livelihoods, and the environment.



ARE YOU A FUNDER?

Get more impact with every dollar you spend.

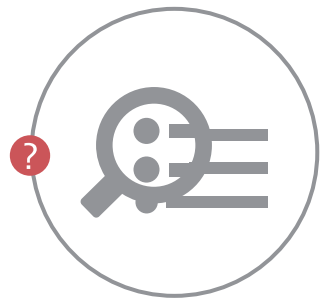
Support an integrated approach to water services and see a greater and enduring impact on poverty, equity, and resilience.



ARE YOU A POLICY MAKER?

Address poverty across sectors.

Champion policies that make it easier to implement projects addressing health, livelihoods, and environment simultaneously.



ARE YOU A RESEARCHER?

Build the evidence base.

Critically evaluate the poverty and environmental impacts of planned multiple-use water services.



IMPLEMENTER

Potential Benefits

- Increasing income through water-related livelihoods motivates people to maintain water infrastructure.
- Addressing all needs for water reduces conflict.
- Integrating the implementation of projects across sectors increases efficiency.
- Working across sectors can increase stability of funding.

Potential Challenges & Solutions

- Maintaining quality programming across sectors can be challenging.
 - Partner with complementary organizations that have the necessary technical skills for health, livelihoods, and environment activities.
 - Expand your services gradually based on available resources.
- Designing and implementing integrated programs may require more investment.
 - Partner with organizations that have complementary funding in the same location to leverage existing resources.
 - Integrate financing from multiple donors.

How to start

- Understand the different ways water is being used and identify challenges and opportunities.
- Consider how to mitigate negative impacts of unplanned water uses and build upon positive impacts through more holistic planning.
- Provide a sufficient quantity of water for livelihoods activities.
- Ensure water is of adequate quality and reliability to meet household needs.
- Assess the sustainable yield of water resources and potential environmental impacts of multiple-use water services projects.
- Empower women to make decisions and participate in ownership of water services and related benefits.
- Participate in learning forums with organizations already implementing multiple-use water services projects.



FUNDER

Potential Benefits

- Implementing SolutionMUS better addresses many poverty reduction strategies at once (e.g., potable water, food security, climate resiliency).
- Providing more water yields greater impacts for every dollar invested. Above 20 liters per capita per day, each additional liter of water increases income by \$.50 to \$1.00 per year (Renwick, et al, 2007).
- Integrating services that support livelihoods enhances the sustainability of your water sector investments.

Potential Challenges & Solutions

- Funds are allocated by sector.
 - Break down silos for funding.
- Funding new approaches is challenging.
 - Consult with other funders and sector experts to understand costs, timeframes, and expected results.
 - Consider pilot activities for learning, replication, and scale-up.
 - Use indicators that focus on sustainability of impact rather than on number of people served.

How to start

- Start discussions across sectors within your organization or among grant recipients.
- Create incentives for integrated programming, such as opportunities to combine WASH, Nutrition, and Agricultural Extension, or Climate Change and Food Security.
- Help implementers find complementary partners across sectors.
- Fund initiatives for learning, replication and scale-up.



POLICY MAKER

Potential Benefits

- Implementing SolutionMUS addresses multiple poverty reduction targets simultaneously.
- Providing integrated services permits a more streamlined approach for measuring impacts.

Potential Challenges & Solutions

- Working across sectors can be difficult since many technical government agencies are sector-based.
 - Work at the local level where departments are not as compartmentalized.
 - Find common points of interest that encourage cross-sector collaboration.
 - Create incentives for integrated approaches.

How to start

- Allocate specific funds for multiple-use water services and supporting programs for health, livelihoods and the environment.
- Support the development and financing of integrated programs among sectors.
- Develop water quantity guidelines that account for water needs for both health and for livelihoods.
- Use indicators that prioritize sustainability.
- Account for benefits that may fall outside of a given sector and measure the value added by integrated programming.



RESEARCHER

Potential Benefits

- Publishing research on impacts of SolutionMUS and multiple-use water services builds the evidence base, strengthens the approach, and influences decision-making.

Potential Challenges & Solutions

- Performing quality research on an understudied topic requires good data.
 - Partner with implementing organizations to access existing project documents including baseline and evaluations.
- Funding for interdisciplinary research can be difficult to secure.
 - Highlight broad-reaching implications research could have on investments in water sector.
 - Tackle manageable research questions.

How to start

- Visit sites of SolutionMUS or planned multiple-use water services to understand both the process of implementation and impacts of interventions.
- Examine and evaluate cross-cutting aspects of program impact, such as sustainability of services or enhanced resilience.
- Share research findings with implementing organizations, policy makers, and funders.

Appendix

GLOSSARY

Agricultural extension refers to the transfer of knowledge and skills from experts to farmers in order to increase the productivity of crops and gardens.

CLTS refers to Community Led Total Sanitation, a methodology for sanitation behavior change that mobilizes communities to end open defecation.

Environment refers to physical and biological elements and processes that influence and are influenced by people, animals, and plants.

Gender refers to the social and cultural definition, roles, rights, and responsibilities of men and women. Gender includes concepts of appropriate behavior and ways of relating between men and women throughout the human life-cycle and within households, communities, and larger societies.

Health refers to water-related activities that contribute to people's overall health such as potable drinking water, improved hygiene, sanitation, and nutrition. Medical care, while important to development, is not usually a component within the multiple-use water services context.

Livelihoods refers to water-related activities that contribute to people's income and well-being, such as crops, livestock, or other water-dependent enterprises such as brick making, food processing, or restaurants.

Livestock extension refers to the transfer of knowledge and skills from experts to farmers in order to increase the productivity of animals.

Multiple-use water services is a holistic, participatory approach to water that improves livelihoods and health, increases sustainability, and ultimately improves people's lives. *



Within the water sector, multiple-use water services is defined as an integrated, participatory water service delivery approach that takes people's multiple water needs as a starting point and involves planning, finance, provision and management of sustainable water services for domestic and productive uses.

GLOSSARY (CONT.)

People are the users of water services. They are not a homogeneous group. Different groups in a community may have different social, cultural, and economic backgrounds. Issues of equity and inclusivity should be addressed.

Resilience refers to the ability of a person, household, or community to recover from negative stress in ways that preserve integrity and capacity for positive growth.

Support programs refer to the non-infrastructure aspects of project implementation, including education, promotion, governance, management, training, and policy reform.

Sustainability means meeting current environmental, economic, and social needs without compromising the ability of future generations to meet their own needs.

Technology refers to physical tools, engineered systems, machinery, or technical approaches used in implementation, such as new, rehabilitated or upgraded infrastructure, information systems, or mechanized farm equipment.

Water services refer to the water people actually receive. These services can be delivered with differing levels of quantity, quality, reliability, and distance.

Water sources are undeveloped natural water resources like springs, lakes, rivers, and aquifers. The term 'developed water sources' is sometimes used to refer to human-built services or sources, such as wells, piped systems, or reservoirs.

Water system sustainability in the most basic sense means that the system continues to deliver water as designed (including quantity, quality, reliability, and location) over time. For water to flow continuously, many elements (social, technical, financial, institutional, and environmental) need to be in place. In practice, sustainability often hinges on the ability of the water users to finance, manage, maintain, and repair/replace system components.

Resources on Multiple-Use Water Services

"Keeping the Water Flowing," a 2-minute animated video explaining MUS, Winrock International.
<http://www.youtube.com/watch?v=TP3CfPdmunQ>

MUS Group. 2013. Matching water services with water needs
http://www.musgroup.net/home/advocacy/policy_briefs/matching_water_services_with_water_needs

MUS Group hosted by IRC Water and Sanitation Centre www.musgroup.net

Renwick, M. et al., 2007. Multiple Use Water Services for the Poor: Assessing the State of Knowledge. Winrock International, Arlington, VA, USA.
<http://www.winrock.org/resources/multiple-use-water-services-poor-assessing-state-knowledge>

Van Koppen, B.; Smits, S.; Moriarty, P.; Penning de Vries, F.; Mikhail, M. and Boelee, E. 2009. Climbing the water ladder: Multiple-use water services for poverty reduction. Technical Paper Series 52. The Hague, The Netherlands, IRC Water and Sanitation Centre and International Water Management Institute
http://www.iwmi.cgiar.org/Publications/Other/PDF/TP52_Climbing_2009.pdf

Other Useful Resources

Brikké, F. and Bredero, M., 2003. Linking technology choice with operation and maintenance in the context of community water supply and sanitation. Geneva, Switzerland: World Health Organization and IRC International Water and Sanitation Centre.
http://www.who.int/water_sanitation_health/hygiene/om/wsh9241562153/en/

Sustainable Sanitation and Water Management Toolbox, 2012. www.sswm.info

USAID, 2010. Sanitation Marketing for Managers. Guidance and Tools.
<http://www.hip.watsan.net/page/3395>

WHO, 2005. Sanitation and Hygiene Promotion: Programming Guidance.
http://www.who.int/water_sanitation_health/hygiene/sanitpromotionguide/en/

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Inspirational examples

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We would like to gratefully acknowledge those organizations who took the time to talk with us about their work in water supply:

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- Hararghe Catholic Secretariat, Ethiopia
- Heifer International, Nepal Country Office
- Helvetas, Nepal Country Office
- International Development Enterprises, Nepal and Ethiopia Country Offices
- International Livestock Research Institute, Ethiopia
- Meki Catholic Secretariat, Ethiopia
- Ministry of Irrigation, Nepal
- Nepal Economic Agriculture and Trade Activity, Nepal
- Plan International, Ethiopia Country Office
- Practical Action, Nepal Country Office
- RiPPLE, Ethiopia
- SAPPROS, Nepal
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Questions or comments concerning SolutionMUS or any of the material contained in this guide can be addressed to: Mary Renwick, PhD, Director Water Innovation Program, mrenwick@winrock.org or information@winrock.org

