para todos
por siempre
Agua Potable y Saneamiento en Honduras

User Manual for the Communities and Assets Registry Tool

1

September 2017

User Manual for the Asset Registry Tool

Contents

1. Introduction

The sustainable provision of Drinking water service requires the existence of financial mechanisms to ensure it goes on Forever.

The costing tools are an initiative of Water For People in Bolivia, IRC and Aguaconsult through a fund from IDB-MIF, trying to understand what these costs or different financial mechanisms are, to achieve Everyone coverage, Forever; and to what extent they are being covered in the municipalities.

The following diagram shows what the tools are and the analysis that each one of them performs.

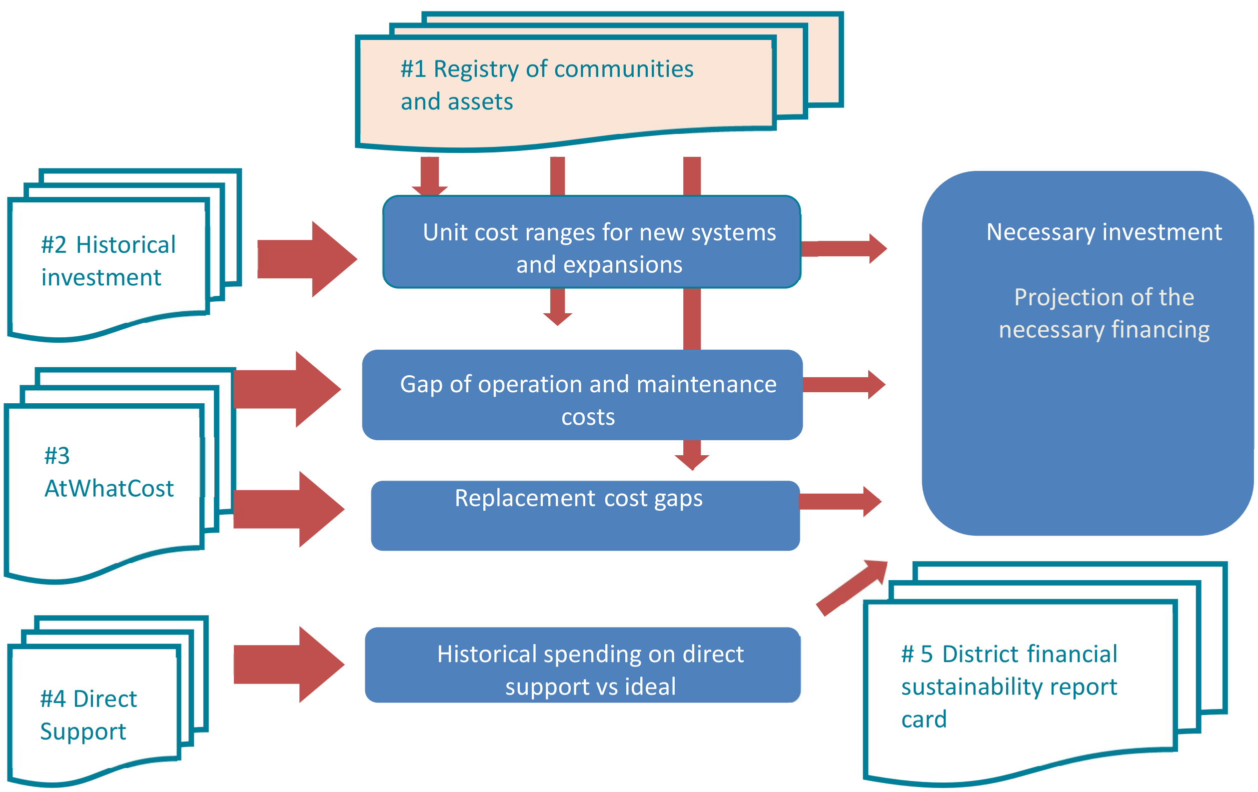


Image 1. Interrelation of costing tools

Costing tools have been applied and contextualized for the Honduran setting.

The following document will serve as a guide for the use and application of tool number 1: Communities and asset registry.

2. Conceptual Framework

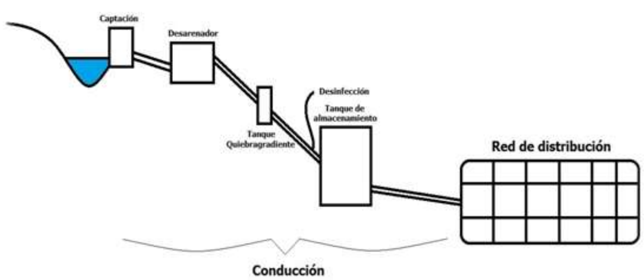
The tool is based on asset management, which involves an analysis of the life cycle, at the level of components of a water system, to maximize its performance. This involves processes of design, construction, expansion, maintenance and replacement of assets. Whereas the different assets that make up a system have different theoretical useful lifetimes.

In addition, it may be that the components require replacement much earlier or after their useful life, depending on their current physical condition. A component that has been well maintained can last much longer than its theoretical useful life; or certain components that have not been maintained or that have suffered some unexpected damage, need to be replaced before their theoretical useful life.

The combination of the age of a component in relation to its theoretical useful life and its current physical conditions indicates the need to be replaced.

In addition, the tool is based on the concept of efficiency in asset management. It can be more efficient to perform a complete rehabilitation of a water system when there are several components in poor condition and that have fulfilled their useful life, than to replace these components. It allows one to modernize the system once and for all and avoids the need to intervene again soon. In other cases, it is more efficient to just replace a component that has problems, and not to do a total rehabilitation.

This tool then analyzes the condition of each one of the components of the system as a whole.



Intake, Sand Trap, Slope Break Tank, Disinfection, Storage Tank, Distribution Network

Piping

3. What is the Communities and Asset registry Tool?

The tool consists of a registry of each of the water systems and communities within the municipality's jurisdiction, of the main components of the water systems, their ages and their physical condition. Based on this information, it identifies the priority with which to intervene in a system or community, and if the intervention is the construction of a new system, an expansion or replacement.

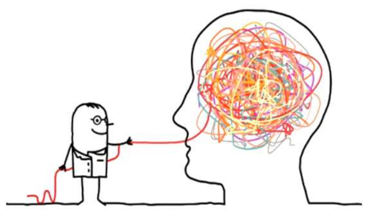
This registry enables both the municipality and its partners to be clear about how much progress has been made and how much is left to reach "Everyone."

4. Objective of the tool

The general objective of the Asset Registry is to identify the communities that still do not have the potable water service and the conditions of the physical infrastructure of the systems in order to prioritize investments for new systems, expansions and the replacement of (components) existing systems.

5. Unit of analysis

The main objective of the asset registry is to identify at the municipal level the state and current condition of each of the components of a drinking water system in the communities. In addition, it identifies those communities that do not yet have a water system.



6. Who should use the tool?

The target audience for the use of the tool are local authorities be they a Municipal Environmental Unit, or a unit dedicated to water and sanitation. It also includes the Intermunicipal Technical Units of Municipal Associations (mancomunidades).

The tool can also be used by national government entities (such as FHIS or SANAA), as well as by non-governmental organizations working at the municipal level.

The tool should be used by any professional with knowledge and good judgment about water and sanitation infrastructure. That means one must have the ability to analyze the physical condition of infrastructure.

It is recognized that many municipalities do not have staff with these skills. In these cases, it may be the staff of an NGO or the National Government who assist in the collection and processing of data. But it is important that municipal staff make the analysis.

7. What is the frequency of the application of the tool?

It is recommended to link the frequency of the application of the tool with the application of SIASAR monitoring, since SIASAR in most municipalities is the most widely used data collection tool. The frequency for updating data in SIASAR is two years. So, it is recommended that one perform an analysis of asset management using this tool every two years too. In addition, it is recommended to update the information each time the municipality builds or rehabilitates a water system.

8. Structure

The tool is an EXCEL file, which has 4 tabs (See image 1).

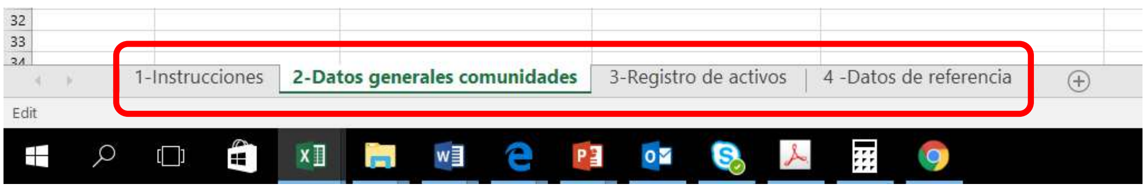


Image 2. Tabs that have the tool file.

Each tab in the file contains:

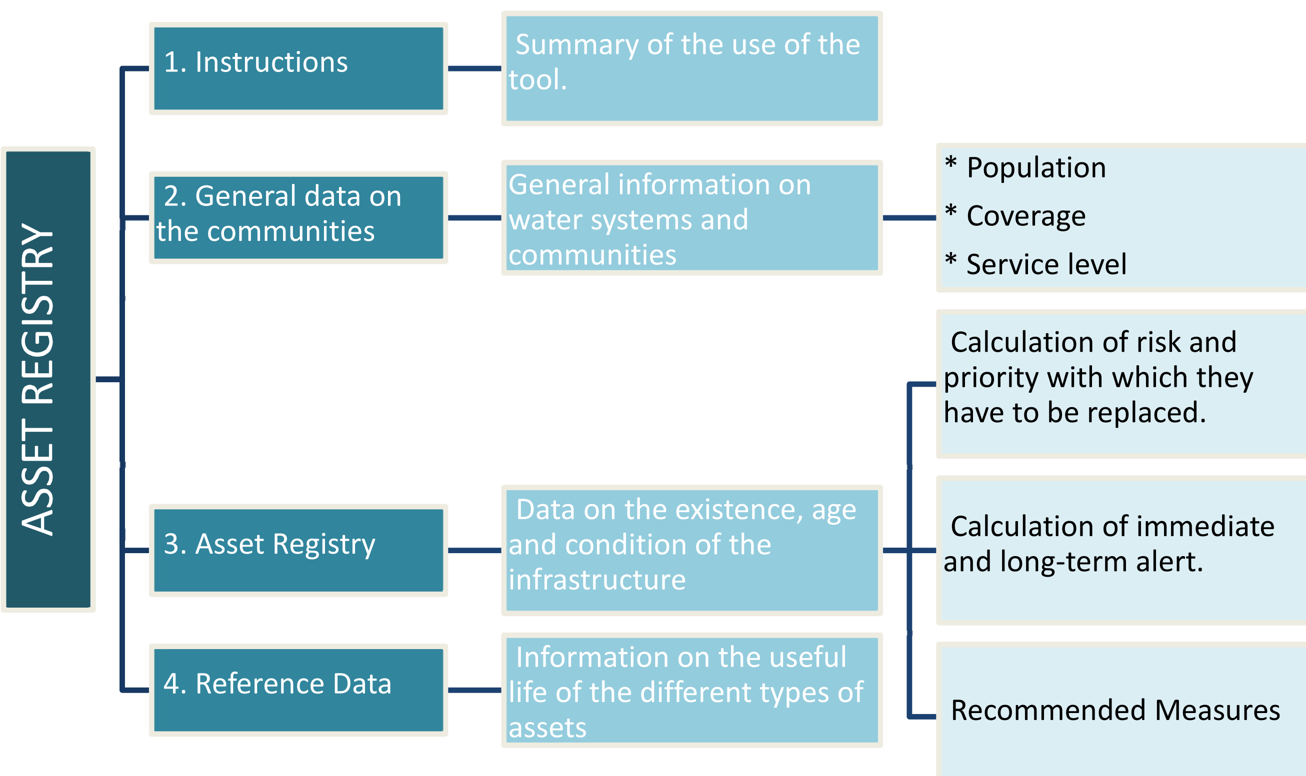


Diagram 1. Structure of the asset registry tool.

9. How does the tool work?

It is intended to analyze system risks based on two main factors:

- ✓ Risk established according to the useful life: This risk will be assessed by recording and analyzing the years in which each of the components of the water system were installed and / or built (construction site, storage tank, pipeline, distribution network, pump, etc.) ; comparing for each component its current age with the expected general useful life.

Baseline Data: useful life	**years**
Intake	15
Adduction pipe	20
Storage Tank	20
Distribution Network.	30
Wells	10
Pumping Station (sump or stall)	20
Pump and electromechanical equipment	7
Treatment Plant	17
Chlorination System	10
Complete System	20

Table 1. Reference data - useful life for each component.

- ✓ Risk established according to the conditions or physical condition of the components: With a focus on the evaluation of the physical condition of each component.

10. How do you apply the tool?

a). Data sources

There are two ways to obtain the data for filling in the tool:

1. The Information System for Rural Water and Sanitation (SIASAR) (from the surveys of communities and systems).
2. Field assessment.

If we use SIASAR:

It is recommended that the user download the "Community" and "Systems" databases (www.siasar.org). If you have problems with the download, it is recommended that you contact the SIASAR unit within the SANAA.

The data that SIASAR does not contain but that the tool requires are:
- Ages of the components of the systems
- Components/systems rehabilitated or replaced
- Year of the rehabilitation or replacement of components/systems

This information may be found in a cadastre, through the municipal water and sanitation technician, or through water boards.

Before using the information in SIASAR, one must take into account that this system is currently in the data collection phase. So, you may not find all the communities and systems of the municipality. So, you may need to validate with municipal staff, if the information is complete or if it will be necessary to supplement it. In general, it is always recommended to validate the information contained in SIASAR.

If we use data collected in the field

In cases where there is no information in the SIASAR, then you should look to see if there is any information system in the municipality or cadastre. If not, then the other source of information should be taken into consideration.

The second source of information is the field assessment. This means having staff resources, time and capital, taking into consideration the following:

The assessment must be made of each water system and every community in the municipality.

- If five communities receive services from 1 different water system, you must perform five surveys, one for each community.
- If a community receives services from 2 different water systems that provide services to two distinct areas of a community, you must perform two surveys, one for each water system.
- If five communities receive services from a combination of 3 different water systems, you must perform five assessments, to take into account the five different communities.
- If there is no water systems in a community, that must be recorded, in order to highlight the communities without services. This will help the local municipal government prioritize for new investments.

b). Filling out tables

I. General Community Data (Tab 2 in the Excel file)

In tab number 2 the general data on the communities such as the name of the community, type of system, coverage, level of service and year of initial construction of the system must be filled in (see image 2).

A	B	C	D	E	F	G	H	I
Municip	Nombre del Sec	Nombre de la comunid	Tipo de sistema	Número de familias con acceso a sistema de agu	acceso al sistema de agua	Número de familias total	Calificacion de Siste	del sistema de agua

***Image 3. General data on the communities and systems*.**

Municipality, Sector name, Community name, Type of system, Number of families with access to water, …access to water system, Total # of families, System rating, …of water system.

If we use SIASAR:

If you are using the SIASAR as a source of information, perform the following steps:

a) From the community database, copy the list of communities in the municipality and enter that information in the columns: Municipality and Community Name (in the case of Honduras, the "sector" column can be left blank).

b) The other columns can be filled from the systems database. With the exception of "service level".

If you do not have the **service level** data, it poses no problem to using the tool, because it does not affect the formulas. Rather, the data works to make a comparison between the final result of the system replacement priority and the level of service it is providing. So this way one can identify if the good or bad service delivery was due to the condition of the system.

c) Take into account that to know the number of families with and without water you have to check the SIASAR database for communities. That is where the number of households/families totals (with and without water) appears. Then go to the SIASAR database for systems. There you will find the number of households/families connected to the system (with water).

Then by subtracting, the number of homes / families with water, from the total number of homes / families in the community, you will get the number of families without water.

If we use data collected in the field

You must fill out the data needed in the table and that is easy to do with just an interview with the Water Management Board, since they are the ones who keep track of the total number of homes in the community and the number of subscribers to the water system, and they also know the year in which the system was built.

I. Asset Registry (Tab 3 in the Excel file)

In the asset registry the first 9 columns (see image 3) correspond to the general data that was entered in tab 2 (General data on the communities). So that information will automatically appear in those columns.

Nombre del municipio	Sector	Nombre de la comunidad	Total de familias viviendo en perimetro del sistema	Total de familias en el perimetro sin acceso (según FLOW)	Total de familias en el perimetro con acceso segun FLOW)	Tipo de sistema de agua	Año en el cual el sistema fue construido por primera vez	Nivel de servicio según FLOW
-	-	-	Número de familias	Número de familias	Número de familias	-	Año	-
Municipio	**Distrito**	**Communidad**	**Total de familias**	**Familias sin accesso**	**Familias con accesso**	**Tipo_sistema**	**Año_construccion**	**Nivel de Servicio**
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		
0	0	0	0	0	0	sin dato		

***Image 4. Columns of general data on communities and systems in asset registry*.**

Municipality name, Sector, Community Name, Total number of families living in the perimeter of the system, Total number of families in the perimeter without access (according to FLOW), Total number of families in the perimeter with access (according to FLOW), Type of water system, Year the system was first built, Service level according to FLOW

In the following 18 columns as shown in image 4 for each of the components of a system (work site, adduction pipe, storage tank, etc.) their presence or absence will be indicated along with the year in which each was built or rehabilitated.

If the component exists, it will be indicated with the **number 1** otherwise it should be **left blank**.

Presencia de obra toma. Si: 1; No: blanco	Año en el cual la obra toma fue construido. Si hubo reconstrucción, Año en el cual la ultima reconstrucción fue realizado. Si no hay: dejar en blanco	Presencia de línea de aducción o de impulsión. Si: 1; No: blanco	Año en el cual la líne fue construido. Si hubo reconstrucción, Año en el cual la ultima reconstrucción fue realizado. Si no hay: dejar en blanco	Presencia de tanque de almacemamiento. Si: 1; No: blanco
-	Año	-	Año	-
Obra_toma	**año_obra toma**	**Línea de aducción**	**año_linea**	**Tanque de almacenamiento**

Image 5. Data columns showing the absence or presence of components with their respective year of construction.

Existence of intake (Yes: 1, No: blank), Year when the intake was built. If it was reconstructed, the year when the last reconstruction took place. If there isn't one, leave blank, Existence of adduction or drive pipe (Yes: 1, No: blank), Year when the pipe was built. If it was reconstructed, the year when the last reconstruction took place. If there isn't one, leave blank, Existence of storage tank (Yes: 1, No: blank)

Next to the mentioned columns, there are 9 more columns (see image 5), in which we will indicate the physical condition of each of the components that a system has.

The physical condition of each component will be indicated by:

- If the physical condition of the component is " **normal**," this means that the current physical condition of the component does not affect the functionality of the component. Some small repairs or perhaps more detailed maintenance may be necessary, in order to avoid future problems, but these deficiencies will not prevent the functioning of a component, at the time of the evaluation.
- If the physical condition of the component is **"bad,"** it means that currently, the physical condition is so bad that the functionality of that component will be affected and hampered. Repairs or replacements are required for the component to operate at full capacity.
- Number **"3"** if the component **does not work,** the component does not work in any way, possibly affecting the operation of the system. Replacement is required for the component to work again.
- In case the system does not have the indicated asset, it is left blank.

When using SIASAR to fill in these columns, the systems database should be used. In it you will find the condition of the catchment, pipeline network, storage and distribution network. Where there are four ways to express its condition:

Good condition (which for the tool is weighted with the number 1)
Requires minor maintenance (which for the tool is weighted with the number 2)
Requires minor works (which for the tool is weighted with the number 2)
Requires reconstruction (which for the tool is weighted with the number 3)

Estado físico de la obra toma: 1: normal; 2: mal; 3: no funciona. Dejar en blanco si no hay obra toma	Estado físico de la linea de adducción o impulsión: 1: normal; 2: mal; 3: no funciona. Dejar en blanco si no hay obra toma	Estado físico del tanque: 1: normal; 2: mal; 3: no funciona. Dejar en blanco si no hay obra toma	Estado físico de la red de distribución: 1: normal; 2: mal; 3: no funciona. Dejar en blanco si no hay obra toma	Estado físico del pozo: 1: normal; 2: mal; 3: no funciona. Dejar en blanco si no hay obra toma. Si hay varios pozos, usar datos del que se encuentra en estado más critico
-	-	-	-	-
Estado_obra Toma	**Estado_linea**	**Estado_tanque**	**Estado_red**	**Estado_pozo**

***Image 6. Columns to indicate the physical condition of each of the components*.**

Physical condition of the intake: 1: normal, 2: bad, 3: doesn't work. Leave blank if there is none.
Physical condition of adduction or drive pipe: 1: normal, 2: bad, 3: doesn't work. Leave blank if there is none.
Physical condition of the tank: 1: normal, 2: bad, 3: doesn't work. Leave blank if there is none.

Physical condition of the distribution network: 1: normal, 2: bad, 3: doesn't work. Leave blank if there is none.
Physical condition of the well: 1: normal, 2: bad, 3: doesn't work. Leave blank if there is none.

Tool calculations

In the first instance, the tool calculates the remaining life for each component (See image 6), taking into account the year of construction or last rehabilitation and the useful life of each (See **Annex 1** for reference data for the useful lives of the components of a system).

Vida restante de la obra toma	Vida restante de la línea de aducción	Vida restante del tanque de almacenamiento	Vida restante de la red de distribución	Vida restante del pozo	Vida restante de la estación de bomba	Vida restante de la bomba y su equipo electromecánico	Vida restante de la planta de tratamiento	Vida restante del sistema de cloración
Años	Años	Años	Años	Años	Años	Años	Años	Años
Vida-restante_Obra	**Vida-restante_Línea de aducción**	**Vida-restante_Tanque de almacenamiento**	**Vida-restante_Red de distribución**	**Vida-restante_Pozos**	**Vida-restante_Estación de bombeo**	**Vida-restante_Bomba**	**Vida-restante_Planta de tratamiento**	**Vida-restante_Sistema de cloración**

Remaining life of intake

Remaining life of adduction pipe

Remaining life of storage tank

Remaining life of distribution network

Remaining life of well

Remaining life of pump station

Remaining life of treatment plant

Remaining life of chlorination system

Años=years

***Image 7. Calculation of remaining life for each component*.**

Then it calculates the Degree of Probability that these components reach their useful life.

The tool performs the above calculation on the basis of the following algorithm:

Degree of Probability by components	Remaining Life
High Probability	Less than 4 years
Medium Probability	Between 4 and 10 years
Low Probability	Equal to 10 years

***Table 2. Parameters for calculating the remaining life by component*.**

Likewise, the tool automatically calculates the degree of priority to replace each component (see image 7). To perform this calculation, the remaining theoretical life of the components and the current physical condition are considered, using the following algorithm:

Prioridad por componete para ser reemplazado		
Prioridad de Reemplazo por componente	***Estado del componente***	***Probabilidad de llegar al final de su vida util***
Baja Prioridad	*Normal*	*Probabilidad media o baja*
Media Prioridad	*Malo*	*Probabilidad media o baja*
Media Prioridad	*Normal*	*Probabilidad alta*
Alta Prioridad	*Malo*	*Probabilidad alta*
Sistema no mejorado	*Nueva Construccion*	*n/a*

***Table 3. Parameters for calculating component replacement priority*.**

Priority per component to be replaced

Component replacement priority, Component's condition, Probability of reaching the end of its useful life

Baja=Low, Media= Medium, Alta=High, Malo=Bad, sistema no mejorado=unimproved system

Grado de prioridad de remplazo de obra toma	Grado de prioridad de remplazo de línea de conducción	Grado de prioridad de remplazo de tanque de almacenamiento	Grado de prioridad de remplazo de red de distribución	Grado de prioridad de remplazo de pozo	Grado de prioridad de remplazo de estación de bomba	Grado de prioridad de remplazo de equipo electromecanico	Grado de prioridad de remplazo de planta de tratamiento	Grado de prioridad de remplazo de sistema cloración
-	-	-	-	-	-	-	-	-
Alta Prioridad	Alta Prioridad	Media Prioridad	Baja Prioridad	n/a	n/a	n/a	n/a	Media Prioridad
Media Prioridad	Alta Prioridad	Alta Prioridad	Baja Prioridad	n/a	n/a	n/a	n/a	Alta Prioridad
Baja Prioridad	Baja Prioridad	Baja Prioridad	Baja Prioridad	n/a	n/a	n/a	n/a	Alta Prioridad
Alta Prioridad	Alta Prioridad	Alta Prioridad	Baja Prioridad	n/a	n/a	n/a	n/a	Media Prioridad
Alta Prioridad	Media Prioridad	Baja Prioridad	Media Prioridad	n/a	n/a	n/a	n/a	Media Prioridad
Media Prioridad	Media Prioridad	Media Prioridad	Baja Prioridad	n/a	n/a	n/a	n/a	Media Prioridad
Alta Prioridad	Alta Prioridad	Media Prioridad	Media Prioridad	n/a	n/a	n/a	n/a	n/a
Media Prioridad	Media Prioridad	Media Prioridad	Baja Prioridad	n/a	n/a	n/a	n/a	Media Prioridad
Media Prioridad	Media Prioridad	Media Prioridad	Baja Prioridad	n/a	n/a	n/a	n/a	Alta Prioridad
Media Prioridad	Media Prioridad	Media Prioridad	Baja Prioridad	n/a	n/a	n/a	n/a	Media Prioridad
n/a	n/a	Baja Prioridad	Baja Prioridad	n/a	Baja Prioridad	Media Prioridad	n/a	Baja Prioridad
Baja Prioridad	Baja Prioridad	Media Prioridad	Baja Prioridad	n/a	n/a	n/a	n/a	Media Prioridad
Alta Prioridad	Alta Prioridad	Media Prioridad	Media Prioridad	n/a	n/a	n/a	n/a	Media Prioridad

Image 8. Replacement priority calculation for each component.

Replacement priority of intake

Replacement priority of adduction pipe

Replacement priority of storage tank

Replacement priority of distribution network

Replacement priority of well

Replacement priority of pump station

Replacement priority of treatment plant

Replacement priority of chlorination system

To conclude the calculation made by the tool, for each system in general, it shows us the degree of probability to replace it based on its remaining useful life and then what would be its general condition, concluding what would be the priority to replace that system through a combination of its condition and its useful life.

Depending on the service life, in general it is done by considering the number of components (see table 4).

Degree of Priority	Parameters
High Probability	At least two components reach the end of their useful life within the next four years.

Medium Probability	At least two components reach the end of their useful life within the next four to ten years.
Low Probability	At least two components reach the end of their useful life within the next ten or more years.

***Table 4. Parameters define degree of priority of the remaining life of the system*.**

And to conduct the analysis in relation to the general condition of the system, it is based on the fact that the components are in different conditions, so the statistical "mode" tool will be used or applied, considering the physical condition that is repeated with greatest frequency.

Finally, the degree of priority is established to replace the system as a whole, for this the combination of the remaining useful life and the final rating of its condition are considered, using the following parameters:

General condition of the system	High probability of reaching the end of its useful life.	Medium probability of reaching the end of its useful life.	Low probability of reaching the end of its useful life.
Normal	Medium Priority	Low Priority	Low Priority
Bad	High Priority	Medium Priority	Medium Priority
Not working	High Priority		

***Table 5. Priority rating of water systems using the remaining useful life of the main assets and the general condition of the system*.**

It is necessary for each calculation obtained, an analysis of the next steps to be taken. The tool as such has been adjusted to provide us, depending on the result, a type of alert. This alert may be short-term as well as long-term, for example:

It may appear that the priority to replace a system is low, however, if one considers that there are certain components in poor condition or that due to their useful life they may be getting close to being replaced, as an immediate alert one might consider maintaining these components, naming them and indicating how to do it, either by developing an operation and maintenance plan with the Drinking Water and Sanitation Administrative Boards; [and a long-term alert would be its replacement in good time for the system to be considered on short-term alert (see image 9)].

Grado de prioridad para remplazar el sistema	Tipo de alerta inmediata	Componentes a remplazar o mantener	Actividad prioritaria para técnico del municipio	Tipo de intervención largo plazo
-	-	-	-	
Alta Prioridad	Remplazo de sistema	n/a	Diagnostico técnico	Ninguna
Media Prioridad	Remplazo de componentes	Linea de conduccion, Tanque de almacenamiento,	Visita técnica	Ninguna
Baja Prioridad	Mantenimiento de componentes	Sistema de cloración	Elaborar plan de mantenimiento con JAAP	Remplazo de componentes adelantado

Image 9. Examples of analyses for types of alerts.

Replacement priority for system	Type of immediate alert	Components to replace or maintain	Priority activity for municipal technician	Type of long-term intervention
High Priority	System replacement	n/a	Technical assessment	None
Medium Priority	Component replacement	Water main, Storage tank		
Low Priority	Component maintenance	Chlorination system	Develop maintenance plan with JAPP	Early component replacement

II. Reference Data (4 tab in the Excel file)

In this tab there are four tables; the pink cells are referential values and the orange ones are those where you have to enter information. The following are the details about the tables:

1. Costs per connection for rural systems: this box is where you enter the exchange rate and per capita baseline costs for each of the water supply technologies in the rural area. In addition, you enter the maximum costs at which a technology is not feasible to be implemented. This cost information already comes pre-loaded. Although if they are obsolete, you should review the values used at the country level. If these values do not exist in the sector, apply the historical investment tool to determine them.
2. Useful life of the components of a system. This information also comes pre-loaded. However, if it is obsolete, it is recommended you update it (see annex).
3. Financial data: Here you must enter the year in which the tool is being applied and the inflation rate.
4. General data on the municipality: related to aspects of the population.

1. Interpretation of results

The results obtained with the tool allow us to have a clearer picture of the need to have identified each of the communities, especially those that do not have a drinking water system to prioritize them in new investments. Other communities whose systems are so old that they already require a complete replacement or only of certain components due to their different useful lives.

We will also find that there are communities that are being alerted about preventive maintenance of their systems, avoiding having to replace their system before the scheduled time due to lack of such maintenance; for which municipal water and sanitation technicians must be developing, along with the administrators of these systems - The Water Boards - a plan for the correct operation and maintenance of the system.

Sector No Gubernamental

CRS CATHOLIC RELIEF SERVICES faith. action. results.

water for people

care

Agua Para el Pueblo

IRC

World Vision Por los niños

CEPRADIL
Comité Central Pro Agua y Desarrollo de Lempira

Pure Water FOR THE WORLD

COCEPRADII
Comité Central Pro Agua y Desarrollo de Intibucá

LIVING WATER INTERNATIONAL

Save the Children

Cruz Roja Hondureña

Misiones del Agua INTERNACIONAL

ASOMAINCUPACO
El Agua Manantial de Vida...

Sector Gubernamental

CONASA Consejo Nacional de Agua Potable y Saneamiento

Sanaa El Agua... Un Derecho Humano
Servicio Autónomo Nacional de Acueductos y Alcantarillados.

ENTE REGULADOR DE LOS SERVICIOS DE AGUA POTABLE Y SANEAMIENTO
ERSAPS