03 - Water Supply Sector

Organization Responsible

Level of Responsibility	Name of Ministry/Agency/Institution
Ministry	Ministry of City Planning and Water Supply
Department	National Water Supply and Drainage Board (NWSDB)
District	Regional Support Center
DS Division	Regional Manager
GN Division	Area Engineer

Concepts and Definitions

Water Supply Sector

The water supply sector can be grouped into two types, namely:

a. The **urban commercial water supply** where water is supplied to houses and offices etc. and fees are charged for the amount of water consumed per month;
b. The **rural water supply systems** or the community based organizations schemes which include single wells (open production wells); closed well with hand pump; closed well with storage and electric water pump and tap stands.

The commercial water supply sector is composed of the different types of water collection, storage, treatment and distribution systems with pumping stations, pipelines for distribution, control facilities, and various equipment used to supply water to households and other commercial or industrial entities. If sewerage disposal or treatment is part of the water supply, it should be considered as part of the sector. The water supply company may be owned by the government or by private corporations, but in Sri Lanka water supply is provided by the government under the National Water Supply and Drainage Board (NWSDB).

Damages

In the water supply sector, damages are cost of: a) repair of partially damaged assets and/or b) replacement of totally destroyed assets and infrastructure. For the commercial water supply, damages can happen under each of the various sub-systems such as:

- Water intake
- Treatment plant and storage
- Water distribution

The types of assets in the commercial water sector are generally:

- Structures such as office buildings, storage buildings, etc.
- Office equipment and machinery like computers, air conditioners, etc.
- Vehicles, tools, and stock materials and supplies, etc.

Rural water supply damages can occur when the wells, hand pumps and their support structures are totally or partially destroyed due to inundations and contaminations, among others.

Damages in this sector will occur at the time of, or shortly after the disaster although some damages may become obvious only after a longer period. Damages are measured in physical terms for which the monetary repair or replacement value is subsequently estimated.

Losses

Losses are the values of foregone revenues or income due to the change in economic flows (income and expenditures) during the period of recovery and reconstruction following the disaster. They are the current value of goods and services that were not and/or will not be produced over a time span due to the disaster until full recovery is attained.

Losses in the commercial water supply will include the following:

- Losses in revenues due to non-provision of water to the users during the period of rehabilitation and reconstruction.
- In the event of power cut, the added cost of the use of generator.
- Foregone sales in water due to the decline in demand from consumers that have been affected by the disaster. This can happen if a large number of households are destroyed and/or there is massive out migration after a disaster.
- Higher cost of chemicals and other inputs in ensuring the quality of drinking water.
- Higher water distribution costs when using tanker trucks to reach users.
- Higher cost due to more intensive operation of systems to compensate for water losses in damaged system components.
- Cost of cleaning of treatment plants and other sub-systems after flooding and removal of debris.

For the rural water supply where there are usually no fees charged to users, there are no losses in revenues. However, the government may incur losses if it will undertake cleaning operations and other activities to ensure that the water source is potable. Rural water supply systems are those used by the people that are not reached by the commercial water supply firms.

It should be noted, however, that manufacturers of bottled water and other similar industries are not under this sector. They should be considered under the commerce and industry sector.

In conducting a post-disaster damage and loss assessment in the water supply sector, the following steps are normally followed for every disaster-affected district.

Steps in Undertaking Post-Disaster Damage and Loss Assessment for Water Supply Sector

To have a complete assessment of the water supply sector, the NWSDB as the agency with expertise in the sector, is recommended to assess both the commercial and rural water supply systems.

Step 1. Collect and/or validate the baseline data for each of the disaster-affected District

Baseline information must be compiled and validated at the national, provincial or district levels before the field assessment or, if possible, prior to the occurrence of disaster. The table below must be completed to be used for the baseline information in the online system for the commercial water sector.

Commercial water supply

The commercial water supply is characterized by a system of processes (from water collection, treatment and distribution) where water is delivered by pipes to individual households for a certain amount of fee paid to the water company. For Sri Lanka, commercial water supply is public in ownership under the National Water Supply and Drainage Board (NWSDB). The NWSDB should, therefore, fill out this baseline information.

Table 1. Baseline information on assets of NWSDB in the District

Name of District		
Number of Employees	**Male**	**Female**

Types of Water Users	Number of Clients	Daily Demand Liters/day	Annual Demand Liters/Year	Rate LKR/Liter
Residential				
Commercial				
Industrial				
Others				
Total				
Average Income Per Year (LKR)				
Assets				
Components	**Average Replacement Cost (LKR)**		**Average Repair Cost (LKR)**	
Water Intake				
Structures				
Equipment				
Others				
Treatment Plant				
Structures				
Equipment				
Others				
Water Distribution				
Structures				
Equipment				
Others				
Main Office				
Structures				
Equipment				
Inventories				
Vehicles				
Others				

Notes in filling out Table 1:

- *It is possible that a water supply system located in one area serves the needs of other Districts or even the whole Province. In such a case, the assets of the water supply system may be located in several Districts. The assessment team must be cautious about the possibility of double counting.*
- *For the structures and equipment, the table can be expanded to include all the types of structures or buildings and equipment, especially those that are vital in the operation of the water supply system.*
- *Year 1 and Year 2 refer to the estimated water demand after the current year.*

Rural water supply system

Rural water supply system is generally composed of different types of water supply from open wells; closed wells with hand pumps; to common tap stands. In Sri Lanka, rural water supply is public in nature. The NSWDB should

Table 2. Baseline information on rural water supply in a district

Name of District:			
Type of Water Supply	**Number of Users (Families)**	**Average Replacement Cost (LKR)**	**Average Repair Cost (LKR)**
Type 1: Open production well			
Type 2: Closed well with hand pump			
Type 3: Closed well with storage and electric water pump and tap stands			
Type 4: Others			

Step 2. Estimate damages and losses

With the baseline information, field assessment should be undertaken in the affected districts after a disaster.

- ✓ *Step 2.1. Estimate the damages and losses to commercial water supply facilities in a district*

During the field visit, direct interviews with the NWSDB officials should be conducted. Since the officials and experts in the firm/s can estimate their respective damages more accurately, the assessment team should let them fill out the table below after explaining the PDNA concepts and methodology. However, only the authorized office should input the information provided by NWSDB in the data entry sheet of the online system.

The value of damages and losses of the commercial water supply sector in the district can be summarized in the following table which will appear in the online reporting system.

Table 3. Damages and losses to NWSDB commercial water supply system

District					
Number of Clients Affected	**Residential**	**Commercial**	**Industrial**	**Others**	
Number of Employees	**Male**		**Female**		
Damages					
Assets	**Number of Totally Destroyed Assets**	**Number of Partially Damaged Assets**	**Total Value of Damages (LKR)**		
Water Intake					
Structures					
Equipment					
Others					
Treatment Plant					
Structures					
Equipment					
Others					
Water Distribution					
Structures					
Equipment					
Others					
Main Office					
Structures					
Equipment					
Inventories					
Vehicles					
Others					
TOTAL					
Losses					
	Average Income per Year	**Reduction in Income (%)**		**Total Losses (LKR/Year)**	**Total Loses (LKR)**
	LKR/Year	**Year 1**	**Year 2**	**Year 1**	**Year2**
Production Losses					
Other Losses					
Cleaning up of debris					
Higher operating costs					
Other unexpected expenses					

TOTAL			

Notes on Table 3:

- *Only the number of totally destroyed and partially damaged assets are required in the above table. The online system will automatically estimate the value of damages based on the 'Average Replacement Cost' and 'Average Repair Cost' from the baseline information table.*

✓ *Step 2.2. Estimate the damages and losses to rural water supply facilities in a district*

Rural water supply systems which are relatively simple should be assessed separately by the NSWDB. The following table will be used in the online system.

Table 4. Damages and losses in the rural water supply sector

District				
Damages				
Type of Water Supply	**Number of**			**Total Damages (LKR)**
	Families Affected	**Totally Destroyed Assets**	**Partially Damaged Assets**	
Type 1				
Type 2				
Type 3				
Type 4				
TOTAL				
Losses				
Type of Water Supply	**Types of Losses**			**Total Losses (LKR)**
	Cleaning up of debris	**Higher operating costs**	**Other unexpected expenses**	
Type 1				
Type 2				
Type 3				
Type 4				
TOTAL				

Notes in filling out Table 4:

- *Only the number of affected assets are required in the table. The online system will automatically estimate the damages based on the replacement and repairs costs in the baseline information.*
- *For the estimated losses, the local authorities or communities in charge of the rural water supply system must be consulted.*

✓ *Step 2.3. Summarize the damages and losses in the sector in a District*

Based on assessment of the commercial and rural water supply facilities, the damages and losses in monetary terms will be summarized in the following table.

Table 5. Summary of damages and losses in a district

Name of District:					
Number of Affected Clients of Commercial Water Supply	**Residential**	**Commercial**	**Industrial**	**Others**	**Total**
Number of Affected Rural Water Supply Users (Families)	**Type 1**	**Type 2**	**Type 3**	**Type 4**	**Total**
Type of Water Supply System	**Damages and Losses (LKR)**				**Total (LKR)**
	Year 1		**Year 2**		
	Damages	**Losses**	**Losses**		
Commercial Water Supply					

Rural Water Supply				
Type 1				
Type 2				
Type 3				
Type 4				
Total				
GRAND TOTAL				

✓ *Step 2.4. Summarize damages and losses in the water supply sector in the Province*

The total estimated effects of the disaster in the province can be summarized by combining the values of damages and losses in the Districts. The following table is used in the online system.

Table 6. Summary of damages and losses in the Province

Name of Province:					
Number of Affected Clients of Commercial Water Supply	**Residential**	**Commercial**	**Industrial**	**Others**	**Total**
Number of Affected Rural Water Supply Users (Families)	**Type 1**	**Type 2**	**Type 3**	**Type 4**	**Total**
Type of Water Supply System	**Damages and Losses (LKR)**				**Total (LKR)**
	Year 1			**Year 2**	
	Damages	**Losses**		**Losses**	
NWSDB Commercial Water Supply					
District 1					
District N					
Total - Commercial Water Supply					
Rural Water Supply					
District 1					
District N					
Total - Rural Water Supply					
GRAND TOTAL					

✓ *Step 2.5. Summarize damages and losses in the water supply sector nationwide*

A nationwide summary of the assessment will be created enumerating the damages and losses of the sector at each province. The data in the national summary should include all the information gathered by the various teams that assessed the different disaster-affected districts. The following table will be used for the national summary.

Table 7. Summary of damages and losses nationwide

Number of Affected Clients of Commercial Water Supply	**Residential**	**Commercial**	**Industrial**	**Others**	**Total**
Number of Affected Rural Water Supply Users (Families)	**Type 1**	**Type 2**	**Type 3**	**Type 4**	**Total**
Type of Water Supply System	**Damages and Losses (LKR)**				**Total (LKR)**
	Year 1			**Year 2**	
	Damages	**Losses**		**Losses**	
NWSDB Commercial Water Supply					
Province 1					
Province N					

Total - Commercial Water Supply				
Rural Water Supply				
Province 1				
Province N				
Total - Rural Water Supply				
GRAND TOTAL				