



Safe Water : Abundance and Need

Introduction:



It became clear to the whole world the fragility of health systems and the methods of viral transmission from many other sources through the Covid 19 pandemic. Water, sanitation and personal hygiene in our Yemeni society were among the top sources that raised fears of transmission through the fragility of the water, sanitation and hygiene systems. Yemen is one of the least accessible and most in need of safe water. Access to water through multiple and unsafe transportation methods from traditional sources such as open wells, in addition to using water through traditional methods in kitchens and bathrooms that are not connected to sanitation or environmental sanitation systems, helps spread diseases and diarrhea among the population and facilitates transmission of infection, especially among vulnerable groups in The community (women and children less than 5 years old) are the most vulnerable to malnutrition in light of the low awareness of the importance of optimal use of water, environmental sanitation and hygiene.

Read in the issue:

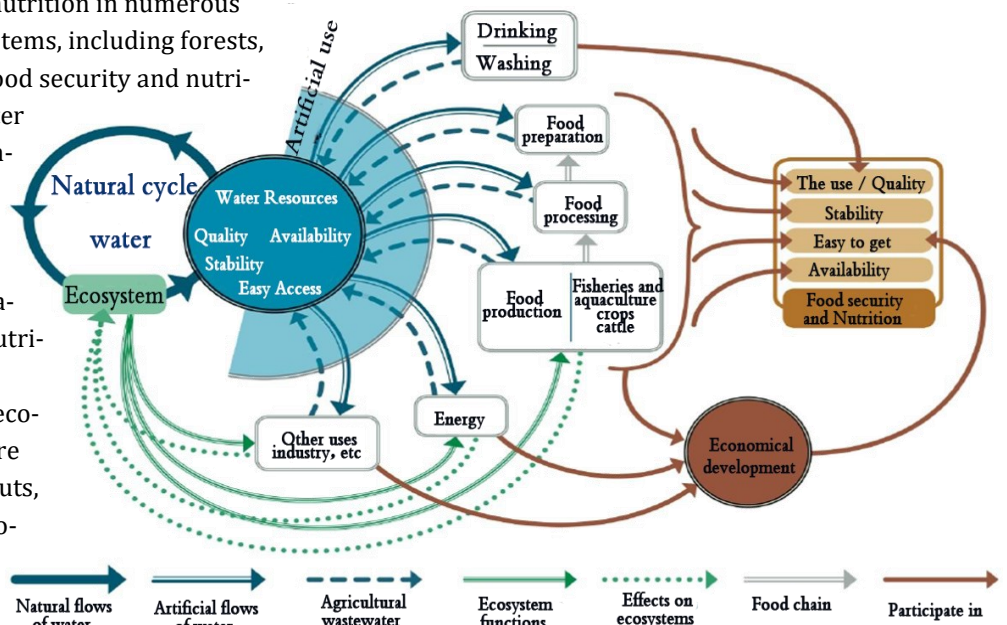
- » The multiple interfaces between water and food security and nutrition (FSN).
- » Water for food security and nutrition .
- » Water Sanitation and Hygien (WASH).
- » Objectives of the Sector Nutrition Plan - Water Sector .
- » Water and Environment Activities in numbers - 2020.
- » Damage of the War on the Water Sector.
- » Expanding the Project Map in the Capital Secretariat (Sana'a).
- » Integrated Water Resources Management (IWRM).

Water Supply and per capita water resources in Yemen

Yemen's water supply is declining every year. According to the World Bank reports, 71% of the population had access to water in 1990 and 65% in 2010. The per capita life expectancy is the lowest in the region and the world. Water resources per capita is 80 cubic meters per year, which is very low compared with the global average of 2500 cubic meters and even the regional average of 1000 cubic meters. The total amount of renewable water resources is estimated to be 2.5 billion cubic meters per year (1.5 billion cubic meters of groundwater and 1 billion cubic meters of surface water). However, the total annual consumption is 3.4 billion cubic meters, which means that 0.9 billion cubic meters of groundwater are drained every year, while the water level of most aquifers drops, About 2-6 meters per year. Consequently, precious groundwater resources are expected to dry up within the next 15-50 years. Yemen's per capita water per year is the lowest in the world, and in the current conflict per capita it is expected to fall to 55 cubic meters per capita per year."

The multiple interfaces between water and food security and nutrition (FSN)

Water determines food security and good nutrition in numerous ways (Figure 1). It is the lifeblood of ecosystems, including forests, lakes and wetlands, on which depend the food security and nutrition of present and future generations. Water of appropriate quality and quantity is essential for drinking and sanitation, for food production (fisheries, crops and live-stock), food processing, transformation and preparation. The quality of drinking water conditions the effective absorption of nutrients by the human body. Water is also important for the energy, industry and other economic sectors. Water streams and bodies are often key ways for transport (including inputs, food and feed). All in all, water supports economic growth, and income generation, and thus economic access to food.



Water for food security and nutrition

report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2015.

The human right to safe and clean drinking water and sanitation were recognized in 2010 by the United Nations General Assembly. It entitles everyone, without discrimination, to access to sufficient, safe, acceptable, physically accessible and affordable drinking water and to physical and affordable access to sanitation for personal and domestic use. It was incorporated in several constitutions and national legal orders.

The right to adequate food has been recognized in the International Covenant on Economic, Social and Cultural Rights (ICESCR), a multilateral treaty adopted by the United Nations General Assembly in 1966. The 2004 Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security (VGRtF) contain dispositions about access to and sustainable use of water.

The human right to safe drinking water and sanitation and the human right to food have close ties because safe drinking water and sanitation are crucial for health and good nutrition, and because access to water is indispensable for food producers, and the right to food of producers.

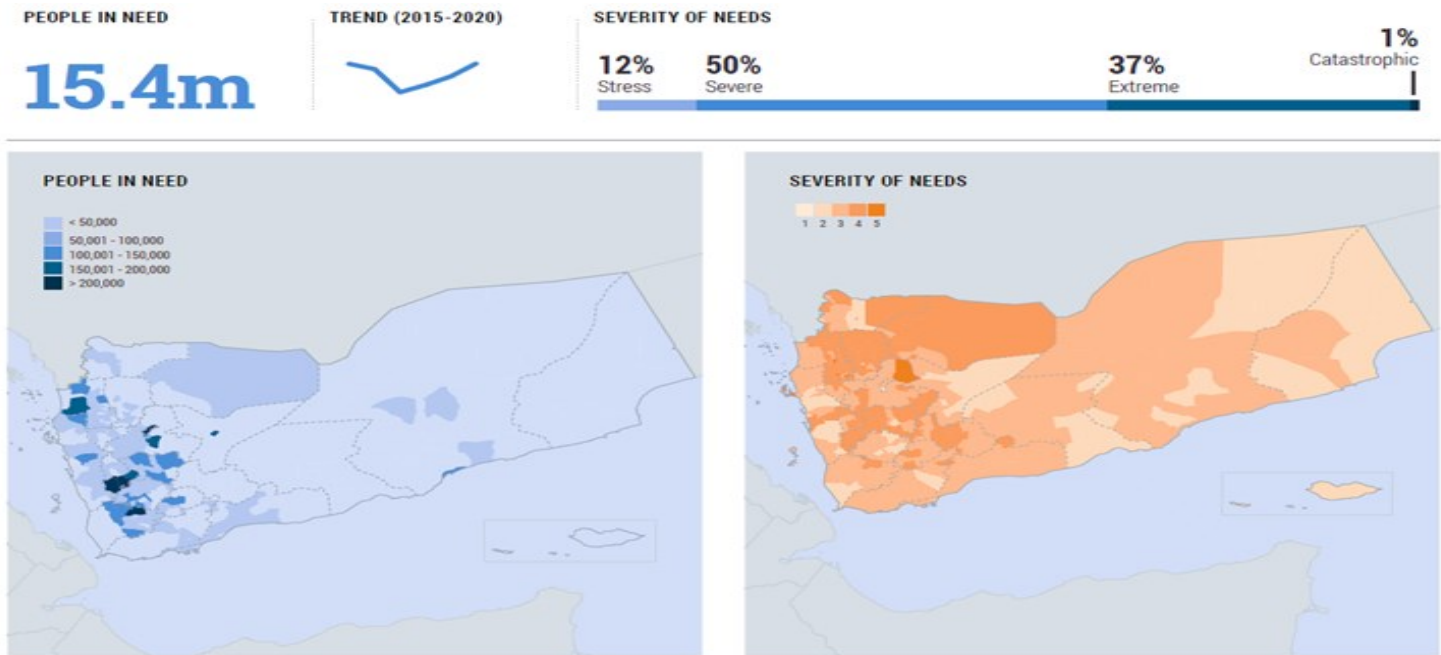
Some of observations and findings of the report:

Water scarcity and access to water	<ul style="list-style-type: none"> ◇ Access to, and use of, water for FSN is informed by social, political and economic power relations within countries, in water basins, and at the local level, as much as by infrastructure and rainfall. ◇ Securing access to water can be particularly challenging for small holders, vulnerable and marginalized populations and women. ◇ in much of the developing world dictate that women and girls are responsible for water collection, which affects their health and nutritional status as well as their education and childcare.
Water quality	<ul style="list-style-type: none"> ◇ The many potential uses of water, typically require different quantities and qualities of water, and therefore often specific treatment, which can be done at the source, or closer to the user, ◇ Poor water quality affects human health and ecosystems' functioning. High water quality standards are needed for drinking water AND food processing . ◇ Environmental impacts of uses and return flows vary between uses, as well as depollution needs .
Managing water scarcities in agriculture and food systems	<ul style="list-style-type: none"> ◇ Improving water management in agriculture and food systems aims at improving the productivity of agriculture and food systems for FSN ◇ Improving water management for FSN mobilises actions ranging from appropriate planning and optimization of resources, inputs and means of production, in both rainfed and irrigated systems, as well as along food chains, to sustainable management of ecosystems and landscapes which enhance, regulate and stabilize water provision. Water management will be key to the adaptation to climate change of agricultural systems both rainfed and irrigated. ◇ For future food security, land and water management needs to preserve ecosystem functions and ensure the future of the resource.
Management for improved water and agriculture productivity	<ul style="list-style-type: none"> ◇ A range of means such as plant and livestock breeding, agro-ecology and conservation agriculture can also improve water productivity in both rainfed and irrigated systems. ◇ Better integration of plant and livestock production can improve nutrient management and water use efficiency. ◇ In food processing, water management issues mainly regard the quality of the water needed, and the impact of activities on water quality through discharged water.
The challenge of integration and prioritization	<ul style="list-style-type: none"> ◇ In many countries, That national water policies prioritize food security and nutrition may be a challenge due to the lack of integration at the decision-making level. ◇ Sustainable management of water resources for FSN often depends on the protection and conservation of specific ecosystems, particularly wetlands and forests, which themselves also contribute to the FSN of local populations. Similarly, quality water streams and bodies are important for inland fisheries and aquaculture.
Water quality for food production and transformation	<ul style="list-style-type: none"> ◇ Water quality is of crucial importance for food production and transformation. ◇ Many food-borne illnesses can be related back to poor water quality used in food production and/or post-harvest processing and/or food preparation. thus impacting on food safety and public health. ◇ The use of treated wastewater for crop production is common in both countries of the North and South, but generally regulated in the former regarding the quality of the wastewater and the type of crops that can be watered, to address health concerns (FAO, 1985). Regulation of irrigation with wastewater is, however, weak in most countries of the global South with potential negative impacts on human health.

Water Sanitation and Hygiene (WASH)

Yemen Humanitarian Needs Overview 2021 (February 2021) OCHA]

Access to safe water and sanitation remains a high priority in Yemen which has the lowest water per capita globally, coupled with increased water scarcity and WASH related diseases that have reached critical levels. An estimated 15.4 million people require support to meet basic WASH needs, including 8.7 million who are in acute need. Infrastructure damage from conflict, the effects of climate change and natural hazards, a deterioration in socio-economic conditions and import disruptions (especially fuel) are the major drivers. Communities are forced to resort to negative coping practices which are significantly heightening the risk of malnutrition and increasing the WASH related disease burden and outbreaks including cholera.



PEOPLE IN NEED (PIN)	ACUTE PIN	MODERATE PIN	WOMEN	CHILDREN	WITH DISABILITY
15.4 m	8.7 m	6.7 m	23 %	55 %	15 %

Analysis of Humanitarian Needs

About 49 per cent of Yemenis have no access to safe water and 42 per cent have no adequate sanitation. Major disparities persist between rural and urban areas, with 51 per cent and 28 per cent of these populations not using improved water sources respectively. People in rural areas are also less likely to use improved sanitation facilities (56 per cent compared to 79 per cent in urban areas). Lack of access to adequate water, sanitation or hygiene services rises considerably in cholera-priority districts and communities experiencing IPC Phase 4 conditions or above. Water quality remains a serious issue, with 50 per cent of Yemenis reporting issues relating to taste, appearance or smell of their water source. Sanitation remains a major public health risk, with open defecation practised by 4 million people (13 per cent of population). Open defecation was observed in 88 per cent of cholera prioritized districts and is highest in areas with critical malnutrition rates. Only 9 per cent of households report garbage collection through a public system.

In terms of hygiene, only 45 per cent of Yemenis report having access to soap, whilst less than 50 per cent of populations in districts with high incidence of WASH related disease report washing their hands at critical times. These conditions greatly favour the spread of communicable disease, including COVID-19 and diarrhoeal disease that contributes to malnutrition, famine risk and cholera.

Projection of Needs

WASH needs are projected to increase in 181 districts in 2021, including in 86 cholera priority districts and 8.6 million people living in IPC Phase 4 conditions. Ongoing conflict, economic decline, increasing water scarcity, natural hazards and other challenges are expected to continue to push WASH needs higher during the year. This in turn is expected to drive higher rates of disease and poor health outcomes, including worsening acute malnutrition and a possible resurgence in cholera.

Objectives of the Sector Nutrition Plan - Water Sector

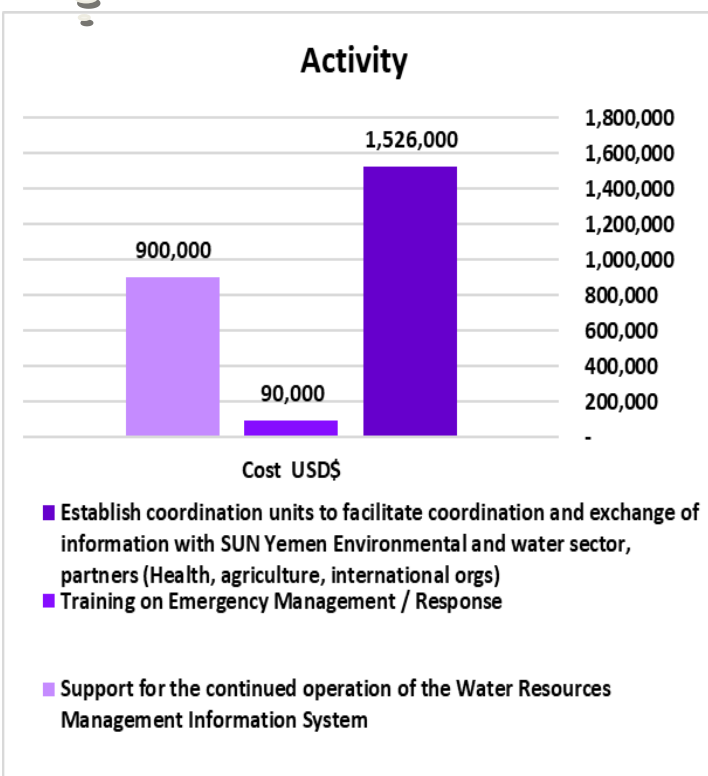
The role of the water sector in the multi-sector nutrition plan 2021/2023 is to increase the availability of potable water at the family level, with a focus on and give priority to malnourished populations, and have access to clean, hygienic environments, and good sanitation facilities. The total cost of the plan is (\$137,120,342), which will benefit many groups of society (families, displaced people, etc.) in various governorates of the Republic.

The plan contained five direct objectives; each objective contains a range of different activities:

- Objectiv1** Improve WASH sector capacity for multisectoral coordination and emergency response
- Objectiv2** Increase availability of potable water with priority for nutrition vulnerable populations
- Objectiv3** Increase access to improved sanitation and safe and hygienic environments
- Objectiv4** Ensure regular water testing is conducted
- Objectiv5** Improve hygiene awareness and practices

Goal	Activity	Cost USD	Purpose of the Activity	Targeted Group	No. of Targets	
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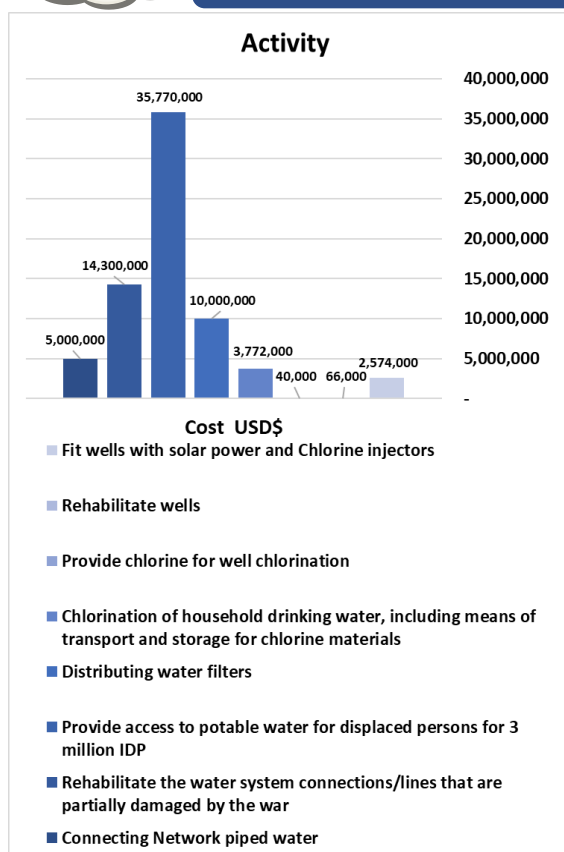
Objectiv1 Improve WASH sector capacity for multisectoral coordination and emergency response



	Purpose of the Activity	Targeted Group	No. of Targets
	Improving the management of projects related to the sectoral plan to raise the level of nutrition, evaluation and follow-up to its implementation and operation, providing information and exchanging it with the Nutrition Secretariat at the Ministry of Planning.	Sectoral plan projects in the Ministry of Water and Environment and its affiliates	3 Unit
	Improving staff capabilities for emergency response and planning.	MWE, GARWSP, NWRA, NWSA, LC's	150 Person trained
	Get and share information quickly and easily when needed.	MWE, Water Sector, Environmental Sector and Partners	3 Unit

Objectiv2

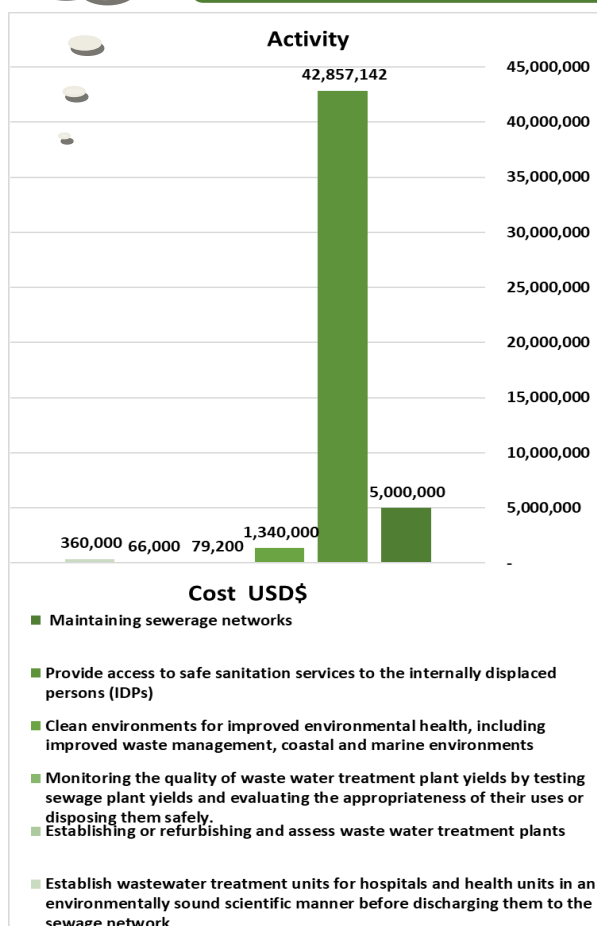
Increase availability of potable water with priority for nutrition vulnerable populations



	Purpose of the Activity	Targeted Group	No. of Targets
	Obtaining water is less expensive, especially during fuel and electricity crises, and its access to the consumer is sterile, free from any disease-carrying microbes, and at an appropriate cost.	Community	33 Well
	Ensuring that water pumping to consumers does not stop and is provided to consumers in the required volume	Community	22 Well
	Providing sterilized water to consumers	Community	50 Well
	Ensuring that sterilized and chlorinated water reaches consumers and is free of pathogens	Household	1,886,000 HH
	Filtering drinking water to preserve the safety and health of citizens and families through the distribution of filters for homes	Household	500,000 HH
	Providing safe drinking water for the displaced wherever they live in all camps and all governorates	IDP	1,000,000 person
	Improving water access to war-affected areas	Community	143,000 pipes
	Expansion of the enterprise water system to increase coverage of drinking water services	Community	100,000 pipes

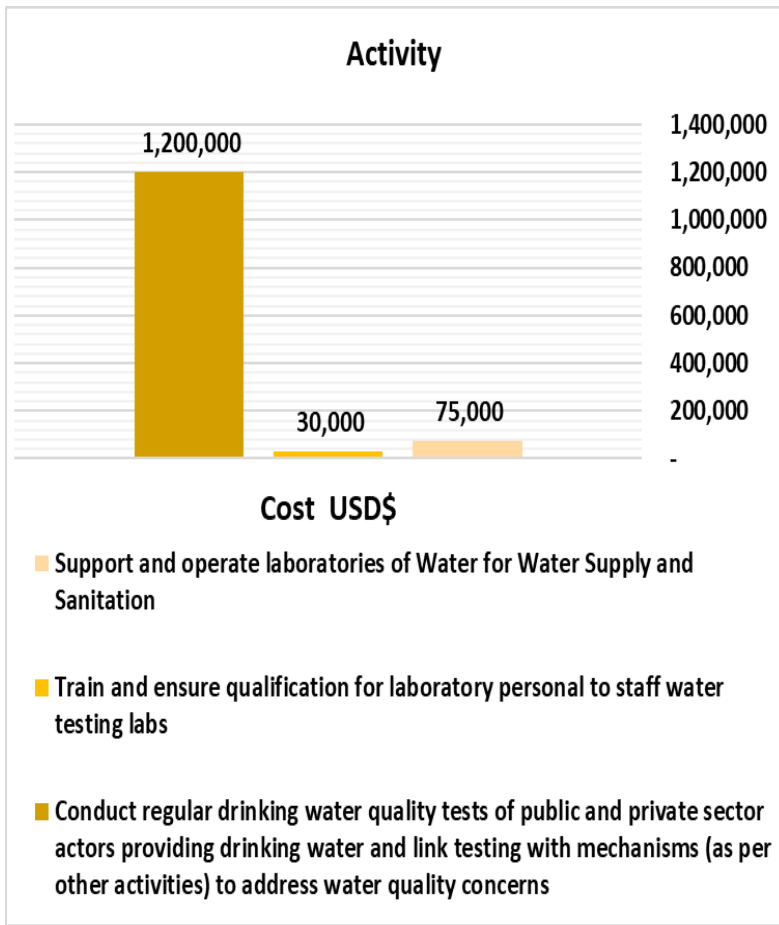
Objectiv3

Increase access to improved sanitation and safe and hygienic environments



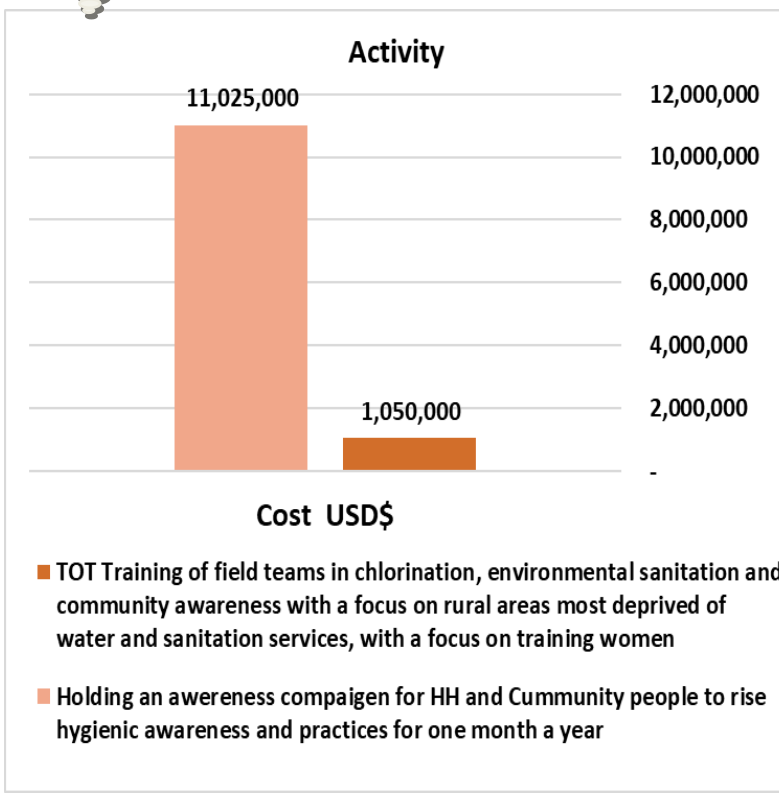
	Purpose of the Activity	Targeted Group	No. of Targets
	Continuing the sewage service for the areas under service and interruption for malfunctions and blockages due to use	HH	100,000 person
	Improving sewage services for displaced persons wherever they are, providing mobile bathrooms and draining outputs to a suitable place	IDP	142,857 person
	Improving the general environment of the areas affected by environmental projects and assessing the effects resulting from investment and development	MWE, EPA, MLA, Local Administration	9 team or studies
	Assessing the outputs quality of wastewater treatment plants by conducting cycle tests for the outputs	Community	66 Sample
	Assessing the outputs quality of wastewater treatment plants and their use in irrigation by preparing studies to assess outputs and their use after treatment	Community	22 study
	Treatment of wastewater outputs for hospitals before come out from the hospitals into the public network and the possibility of using them to irrigate public gardens and pedestrian safety islands	Governmental Hospitals and Medical Centers	6 Units

Objectiv4 Ensure regular water testing is conducted



Purpose of the Activity	Targeted Group	No. of Targets
Rehabilitation of water and environment laboratories in the entities affiliated with the Ministry to perform their role to the fullest extent in serving water and environmental issues.	water system that are partially damaged by the war/ community	25 laboratory
Enabling laboratory staff to carry out their full tasks in test water samples, sewage outputs and environmental pollutants through training and rehabilitation of available staff and the dispatch of new staff .	The cadres available in the laboratories of the Ministry	100 staff
Assessing the quality of drinking water for private water service providers through periodic inspections of produced water.	community	12,000 sample

Objectiv5 Improve hygiene awareness and practices



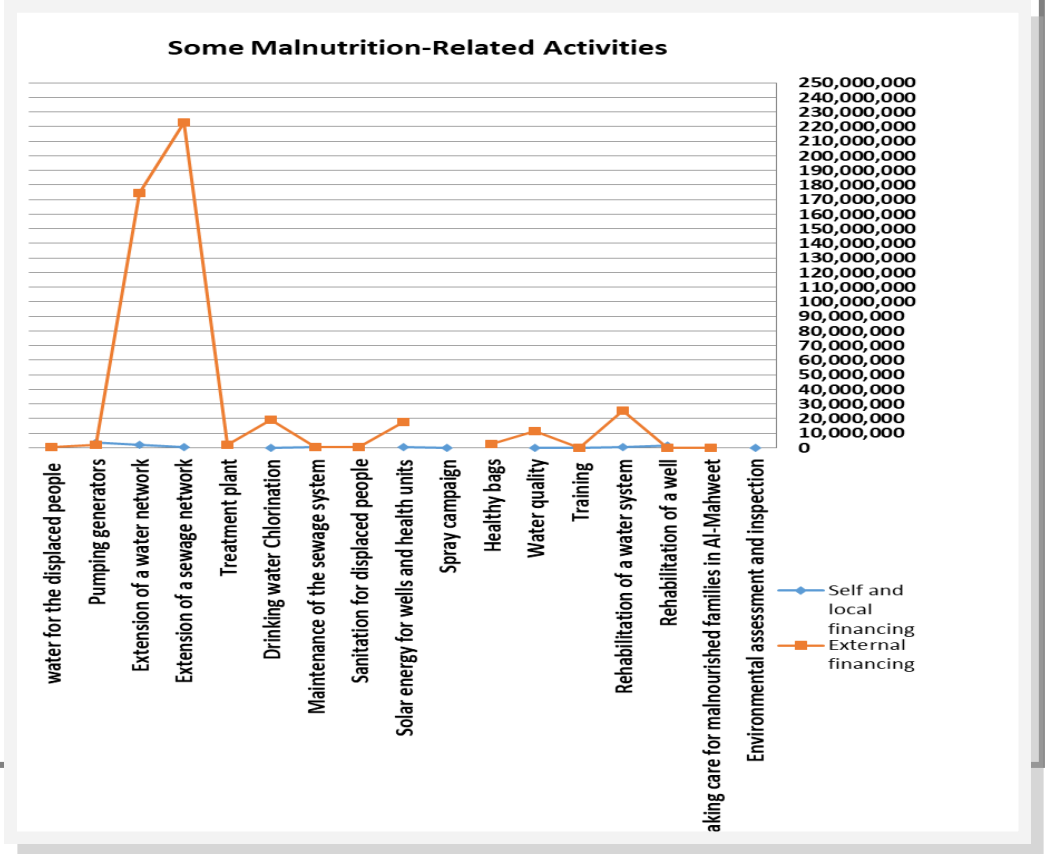
Purpose of the Activity	Targeted Group	No. of Targets
Rehabilitation of field staff of the Ministry of Water and its affiliates to carry out field awareness for residents in neighborhoods, homes, markets, schools and mosques, especially during crises and the spread of epidemics and diseases .	Community	3,500 No. of training
Educating the community and families at home, raising their knowledge of health safety, preventing diseases and improving daily practices that may cause harm to families and individuals.	Community	3,500 Persons or HH

Water and Environment Activities in numbers - 2020

The Ministry of Water and Environment implemented a number of projects and service activities with approximately 894 activities to enhance the access of its services to consumers. These activities distributed to provide solar energy to water & health facilities, extending, connect, and maintain water systems and wastewater systems and drill and maintain its wells, pumps, and wastewater treatment plants and protect the environment from pollution, these activities were funded self-financed and local 2% while external funding was 98%.

These activities included the providing services and protection to malnourished families in Al-Mahweet and the other governorates.

The Ministry also worked in its activities in sterilizing and chlorinating drinking water in its sources, whether public through the government network or privately through the chlorination the tanks of drinking water, providing safe water and environmental sanitation to displaced people in various governorates of Yemen, raising awareness to homes of the dangers of exposure to diseases, epidemics and protection, and the role of sterilization and chlorina-

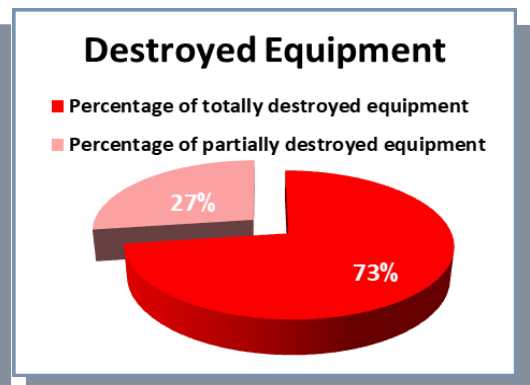
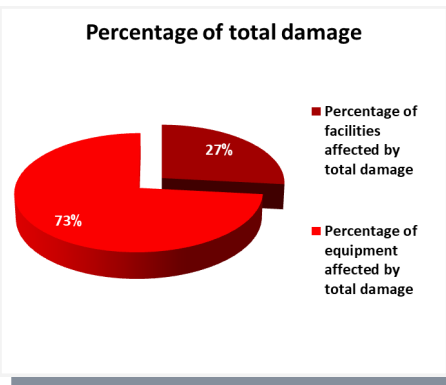


Damage of the War on the Water Sector

The Ministry of Water and Environment issued a report of 2021 on damages on water and sanitation services, which included war damages on water, sanitation and environmental projects and services, resulting in total destruction and partial destruction. The number of war-affected projects reached 1,488, of which 66% were totally affected, while the proportion of projects partially affected was 34%, and the total cost of war-affected projects was \$640 million, of which 98% were for totally damaged projects and 2% for partially damaged projects.

The Ministry of Water and Environment is vigorously improving its services, providing safe water and environmental sanitation to alleviate the suffering of beneficiaries in access to service from the spread of diseases and epidemics, improve nutrition, and reduce the burden on the poor and families affected by malnutrition.

Damage assessment is based on modern scientific methods and information collected from actual sources.



Expanding the Project Map in the Capital Secretariat (Sana'a)

In 2020, the water and sanitation sector in the Capital Secretariat (Sana'a) witnessed a qualitative shift in the expansion of the map of water and sanitation projects, despite the shortage of potential due to the continued economic embargo imposed on the country. The Authority of Water and Sanitation of the Capital Secretariat has been able to achieve significant successes in water services indicators, completed projects to meet the growing needs of capital secretariat's residents, and displaced people in all districts.

Expansion Strategy:

As part of the strategy plan to expand the water services map, the efforts of the Leadership of the Capital Secretariat and the Water Corporation have mobilized energies and harnessed all available possibilities to improve and continue pumping drinking water to the residents of the Capital Secretariat and improve services.

The water sector has made achievements in implementing projects, which included connecting a drinking water and sewage network to many neighborhoods in various districts, replacing a number of sewage main lines, and maintaining and repairing others, in partnership and cooperation with some supporting bodies.

Executed projects:

The total number of projects and activities carried out by the Foundation over the past year was 35 projects at a cost of \$2,342,444, in addition to interventions and emergency work.

According to the Foundation's annual report, more than 3 million people have benefited from projects and activities carried out in various districts.

In accordance with the report, the projects included the connecting new water systems, further expansion, maintaining network lines and improving water services, as well as projects to drill alternative wells and rehabilitate other wells, and the installing and operation of sterilization and treatment units for drinking water (chlorine injection + iron removal).

The projects included the construction of reinforced concrete tower tanks in a number of neighborhoods, maintaining of the Foundation's reservoirs, the operating of solar wells and the supplying and installing of generators and integrated well pumping units.

Operation and Processing:

The report indicates that new connection and expansion projects and expansions of sewage systems have been implemented, rehabilitation of dilapidated asbestos networks, maintenance and rehabilitation of treatment units at the main



Integrated Water Resources Management (IWRM)

It refers to a curriculum that attempt to reflect and balance a variety of interests of stakeholders, including households, agriculture, industry, business and the natural environment. The current IWRM frameworks can provide decision makers with a platform to engage more diverse stakeholders groups and move to multi-value water management.

Principles of Integrated Water Resources Management:

- ❑ Freshwater is a limited and vulnerable resource, which is essential for the preservation of life, development and the environment.
- ❑ Water development and management should be based on a participatory approach, including users, planners and policy makers at all levels.
- ❑ Women play a pivotal role in securing, managing and protecting water.
- ❑ Water is an economic value in all its competitive uses and must be considered an economic commodity.

The general framework for the work of the integrated water resources management:

IWRM rests upon three principles that together act as the overall framework:

Social equity , Economic efficiency , Ecological sustainability.

An IWRM approach focuses on three basics and aims at avoiding a fragmented approach of water resources management by considering the following aspects:

Enabling Environment , Roles of Institutions , Management Instruments.

Conditions for implementing integrated water resources management:

- » Political will and commitment ,
- » Capacity development ,
- » Adequate investment, financial stability and sustainable cost recovery ,
- » Monitoring and evaluation.

* Integrated Water Resources Management - Hamed Assaf , And Wikipedia

Diarrhoeal: a major cause of malnutrition?

Diarrhoeal, the second leading cause of child death around the world and the leading cause in sub-Saharan Africa, is both a cause and a result of inadequate nutrition. According to WHO (2010) food- and water-borne diarrhoeal diseases kill an estimated 2.2 million people annually, most of whom are children in the global South. Repeated bouts of diarrhoea prevent children from achieving normal physical and cognitive development, while poor nutrition weakens the immune system, leading to more frequent bouts of diarrhoeal. The result is a negatively reinforcing cycle. In addition, infection impacts negatively on nutritional status by reducing appetite and intestinal absorption of nutrients. It is estimated that the provision of safe drinking water, adequate sanitation and hygiene education could prevent at least 860 000 child deaths per annum (Prüss-Üstün *et al.*, 2008), suggesting that interventions on the water supply/sanitation side are important nutrition interventions. Integrating WASH, nutrition and behaviour change, based on UNICEF's nutrition framework, has been recognized as an effective means to address childhood malnutrition and has been incorporated into several public health promotion strategies (see for instance the work by Oxfam Intermón: oxfamintermon.org/es).

* Report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2015.

References:

* Ministry of Water and Environment

* Multisectoral Nutrition Plan 2021-2023