



# africalliance socialinnovation

*Delivering community-owned water and sanitation solutions in Eritrea with UNICEF*  
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Assignment

## Abstract

• The Government of the State of Eritrea, in its national development policy and strategy, has recognized and addressed the importance of sustainable water resources management and increasing water use efficiency for livelihoods and sustainable development of the country aimed at promoting rapid economic growth and poverty reduction.

Eritrea faces a number of serious challenges related to water resources management. Climate variability, increasing in demand for water as a result of development and population growth, low level of investment on improving the supply and efficiency of water use, inadequate regulatory and enforcement mechanism for proper water allocation and use, high level of environmental degradations, low level of knowledge on the resources base are some of the key factors with adversely impacting the management of water resources sector. Bearing in mind the above challenges in water resource management, development and use and their urgency of addressing them the Water Resource Department of the Ministry of Land, Water and Environment has developed this Integrated Water Resource Management Action Plan (*IWRM-AP*). This will serve as a road map and allow the nation to start implementation of needed projects/actions to help focus efforts towards Integrated Water Resources Management that will lead to economic efficiency, equity and environmental sustainability.

• The IWRM-AP had the following key objectives;

- 1) Increasing water availability: the strategy is to harness the seasonal water flows and direct them to where they are needed, through catchments rehabilitation, rainwater harvesting through construction of embankments, canals, lining of watercourses and introducing modern methods that enhance on-farm water use efficiency. Another is to store water to irrigate farm plots in seasons with low rainfall. The objective is to augment water storage capacity by constructing water reservoirs, small dams, diversion canals and wells and new irrigation schemes.
- 2) Investment in both urban and rural water supply systems by installing new rural water supply and sanitation systems and rehabilitating old ones.
- 3) Water saving measures such as rehabilitation of watercourses and land leveling and improved water application techniques at the farm level will be undertaken.
- 4) Reorienting the extension and research system towards addressing priority problems and concerns of subsistence farmers, particular emphasis give to on farm irrigation water use.
- 5) Supporting building small dams to harness the seasonal water flows and supporting rehabilitation of degraded catchments.
- 6) Encourage rehabilitation of small scale Irrigation Projects. High priority will be given to the development of smallholder irrigation schemes that have high levels of community participation in planning and cost sharing of the construction (mainly in labor) and full operation and maintenance (O&M) expenses. To encourage efficient utilization of water in agriculture for new water sector projects, water pricing will be put in place.
- 7) In protecting the vulnerable, the strategy emphasizes the need for improving involvement of women in key economic, political and social life of the nation.  
Designating focal points in key sectors ministries and public agencies to promote gender mainstream in national and sectoral policies and programs is one important step identified by the I-PRSP.
- 8) Putting in place the enabling environment and strengthen the institutional capacity to plan, monitor and implement macroeconomic and poverty reduction programs. Among other the devolution of power and enhance popular participation by strengthening capacity of regional governments by increasing decentralization and accountability of administrative operations and peoples participation in their local affairs is one strategy adopted by the I-PRSP.:

## DESCRIPTION AND BACKGROUND

The Government of the State of Eritrea perceives this Integrated Water Resource Management Action Plan as a flexible and dynamic process. The Ministry of Land, Water and Environment has been in the forefront of making sure that the Integrated Water Resource Management Action Plan (IWRM-AP) becomes a framework and an important mechanism for sustainable use and development, following its establishment in 2004.

### Water Resources Potentials

Eritrea is characterized by a semi-arid to arid climate. Annual rainfall over much of the central part of the country is about 500 mm, falling mainly during June to September. Rainfall increases to the southern central highlands, near Adi-Quaila to about 700 mm while the northern mountains, western and eastern lowlands annual rainfall declines to less than 100 in the most arid southern coastal part of the country. Only the eastern escarpment has annual maximum of about 1050 mm. This area and eastern lowland are also marked by a peak of rainfall in the winter (October to March) in contrast to the June to September peak in the rest of the country.

Surface water resources have been divided into five major River Basin systems namely, Mereb-Gash; Barka-Anseba, Red Sea Basin, Danakil Basin and Setit. Due to inadequate published rainfall and stream flow data, the runoff of various River Basins has been estimated either from modeling (for ungauged catchments) or simulation (for catchments with short period of data) values, as below.

Basin	Area (km <sup>2</sup> )		Average Annual Yield (BCM)
	Setit	Total	
Mereb-Gash	17,256	23,176	1.923
Barka-Anseba	41,028	41,920	0.932
Red Sea	44,376	44,376	0.061
Danakil Basin	8,305	10,485	0.422
Setit	7,292	68,250	6.23
<b>Total</b>			<b>9.967</b>

Source: Water Resources Department, Water Balance Framework for analysis and planning, 2007.

### Ground Water Resources

There's no comprehensive study on its occurrence, aerial distribution, development potential, and groundwater dynamic. Estimates by AQUASTAT Information system (FAO) has estimated 0.5 billion m<sup>3</sup> while a recent estimate by WRD is around 1.7 billion m<sup>3</sup> annually (WRD, Situation analysis, 2007).

Eritrea is a water scarce country; its annual water availability is highly variable both within a year and over the years. *Drought* is a recurring phenomenon with a considerable impact on water resources. Catchments degradation results in increased runoff, flash flooding, reduced infiltration, erosion and siltation. *Catchment degradation* is one of the major problems, which is undermining the limited water resources base of the country. *Groundwater depletion* is clearly manifested in the shallow and unconfined aquifers of central highland; the eastern and western foothills significantly drop in groundwater level from year to year and run dry during drought periods. Tsilima plain, Alla valley, Hagaz are some of specific areas which suffer due to unregulated withdrawal of ground water. There has been an increase in water demand but *low investment* on infrastructure & storage. Most municipal sewerage plants and industries in the country *discharge partially treated or untreated wastewater* containing high levels of organic, metals and other toxic substance directly into surface water courses. Additionally, *Water Allocation* is done without proper procedures and regulatory instruments.

To maintain the economic pace and social prosperity, it is imperative that enough safe water is available to meet the requirements of agriculture, industries, and the domestic sector in the years to come. While the country appears to be on target on the issue of safe drinking water (63% reach) an estimated 1.3 million people still need to gain access to an improved drinking water source over the period 2016-2020.

In partnership with the Water Resources Department (WRD) of the MoLWE, UNICEF supported over 21,790 people to access safe water for drinking, cooking and personal hygiene, and over 60,000 people received information on appropriate hygiene practices. Additionally, the WRD with UNICEF support and in collaboration with sub-regional administrations, also helped to identify villages that do not have access to clean drinking water. This was in preparation for the construction of rural water supply systems in the selected communities, and included locating nearby sources of water with adequate reserves, to meet the needs of the selected communities. UNICEF supported the WRD and the MoH through procurement of assorted pipes, fittings, and solar pumping supplies for three community water supply systems that benefitted 4,500 people. UNICEF also supported the procurement of 700 ceramic water filters and water purification tablets. Additionally, water quality testing chemicals and equipment was also procured as part of the capacity development of WRD for water quality surveillance.

## TECHNOLOGICAL SOLUTIONS

According to [UNICEF](#) 58% of the total population having access to an improved drinking water source (JMP 2015).

- UNICEF supported the water resources department in implementing water supply systems in the villages, where they dug wells to tap underground water sources.
- For the sustainability of the water supply systems, they are handed over to the WASH committee for operation and functionality management.
- **A challenge to the smooth operation of the system was the unavailability of a skilled technician, lack of availability of spare parts locally and high cost of fuel for fuel-powered generators.** UNICEF Eritrea has started to adopt solar-powered systems as a more energy-saving and environment-friendly approach. The organization is also in discussion with government partners to ease access to spare parts hub at Zoba (regional) and sub-Zoba level.
- In partnership with the Water Resources Department (WRD) of the MoLWE, UNICEF supported over 21,790 people to access safe water for drinking, cooking and personal hygiene.



In Eritrea, a lady fetches water in Debub region

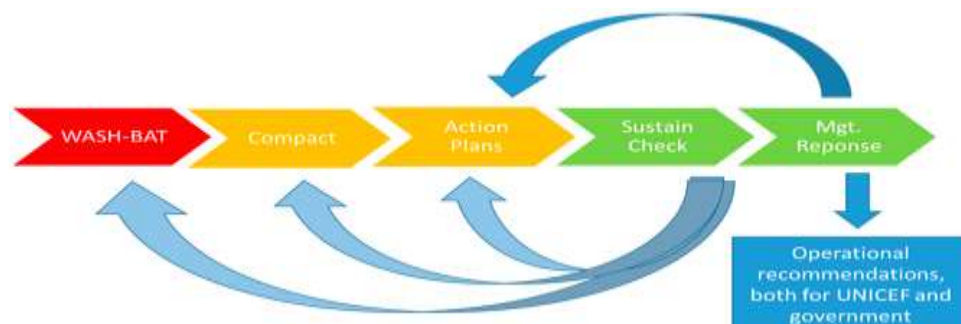
## CAPACITY DEVELOPMENT

- Trainings rolled-out on administration, financial management of the committee, sanitation and project coordination roles.
- During the reporting period 80 villages of 182,790 population size benefitted from newly established water resources in their villages.
- Solar power technicians training has been started to ensure reliability & availability of water supply systems.
- In partnership with the Water Resources Department (WRD) of the MoLWE, UNICEF ensured over 60,000 people received information on appropriate hygiene practices.

## SOCIAL INNOVATION

## GOVERNANCE STRUCTURES

- WASH Committees established. Women play a decisive role in the WASH committees comprising 34.5% of the administration capacity (33% in financial management of the committee, 13% secretaries, 86% sanitation and 5% in coordination roles).
- During the reporting period 80 villages of 182,790 population size benefitted from newly established water resources in their villages. Since independence 1517 water provision systems have been established nation wide and the total potable water supply coverage is currently 85% in rural and 92% in urban areas. Rural women have become the main beneficiaries from both the water supply and energy provisions of the integrated rural development plans of the government.



## BUSINESS ROAD MAP

- Safe, potable water sources are established in rural villages and administered by the village.



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We collect a minimal charge for water of 1 Nakfa per 20 litres from the community members, which is then used for the maintenance and operation of the system. –a WASH committee member

## UNICEF

■ **UNICEF** works in over 190 countries and territories to save children's lives, to defend their rights, and to help them fulfil their potential, from early childhood through adolescence.

The Government of Eritrea with UNICEF's support continues to work to meet and surpass the MDG drinking water target of 73% as the country moves forward with the Sustainable Development Goals (SDGs) adopted by the international community. In 2017, 52,200 were reached with safe drinking water. In this study, objective 2 of the IWRM-AP is continually realized.



### UNICEF activities

#### Health

Healthy children become healthy adults: people who create better lives for themselves, their communities and their countries. Improving the health of the world's children is a core UNICEF objective.

#### Child protection

UNICEF and its partners support the mapping and assessment of child protection systems for improved laws, policies, regulations, standards and services protecting all children.

#### Nutrition

Proper nutrition helps give every child the best start in life. UNICEF is committed to scaling up and sustaining coverage of its current high-impact nutrition interventions.

#### Education

UNICEF in Botswana is committed to ensuring that all children – regardless of gender, ethnicity, socioeconomic background or circumstances – realize their right to a quality education.

#### Social policy

UNICEF works with Government and partners on macro level policies that guide national frameworks, legislative reform and budgetary allocations affecting children and families.

### DESCRIPTION

- [1]. A. Anghesom and B.S. Mathur, "Hydrologic inventory of Mereb-Gash river basin in Eritrea," Lap Lambert Academic Publishing, Deutschland, 2016.
- [2]. A. Anghesom and B.S. Mathur, "Geomorphologic instantaneous unit hydrographs for rivers in Eritrea," Journal of Indian Water Resources Society, vol. 34(1), pp. 1-14, January 2014.
- [3]. B. Bates, Z. Kundzewicz, S. Wu, and J. Palutikof, "Climate change and water," Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva, 2008.
- [4]. D. Mwanza, "Water for sustainable development in Africa, environment, development and sustainability," Kluwer Academic Publishers, the Netherlands, pp. 95-115, 2003.
- [5]. S. Drury, R. Peart, and M. Andrews, "Hydrogeological potential of major fractures in Eritrea," Journal of African Earth Sciences, vol. 32(2), pp. 163-177, 2001.
- [6]. Euroconsult, "Sector review of national water resources and irrigation potential / component 1 surface water resources, unpublished.
- [7]. FAO, "Irrigation potential in Africa: a basin approach", Land and Water Bulletin-4, Rome, Italy, 1997.
- [8]. FAO, "Irrigation in Africa in figures, AQUASTAT Survey-2005", FAO Water Reports, No 29, Rome, Italy, 2005.
- [8]. MoLWE, "Eritrea's initial national communication, under the United Nations framework convention on climate change", unpublished.
- [9]. MoLWE, "National adaptation programme of action," unpublished.
- [10]. MoLWE, "Situational analysis: the state of water resources in Eritrea," unpublished.
- [11]. MoLWE, "Action plan for integrated water resources management (AP-IWRM) in Eritrea," unpublished.
- [12]. H. Zerai, "Groundwater and geothermal resources of Eritrea with the emphasis on their chemical quality, Journal African Earth Sciences, vol. 22(4) pp. 415-421.

### TECHNICAL SOLUTIONS

- [13] <https://www.unicef.org/eritrea/wes.html>

### GOVERNANCE STRUCTURES

- [14] <https://data.unicef.org/topic/water-and-sanitation/sanitation/>

### CAPACITY DEVELOPMENT

- [15] UNICEF Eritrea: <http://www.unicef.org/eritrea/>  
 [16] MoLWE, 2007. "Water Sector Human Resources Need and Development Strategy – Final Draft". Asmara, Eritrea.

### LIST OF ACRONYMS

- IWRM: Integrated Water Resources Management
- MoLWE Ministry of Land Water and Environment
- WRD: Water Resources Department

