FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

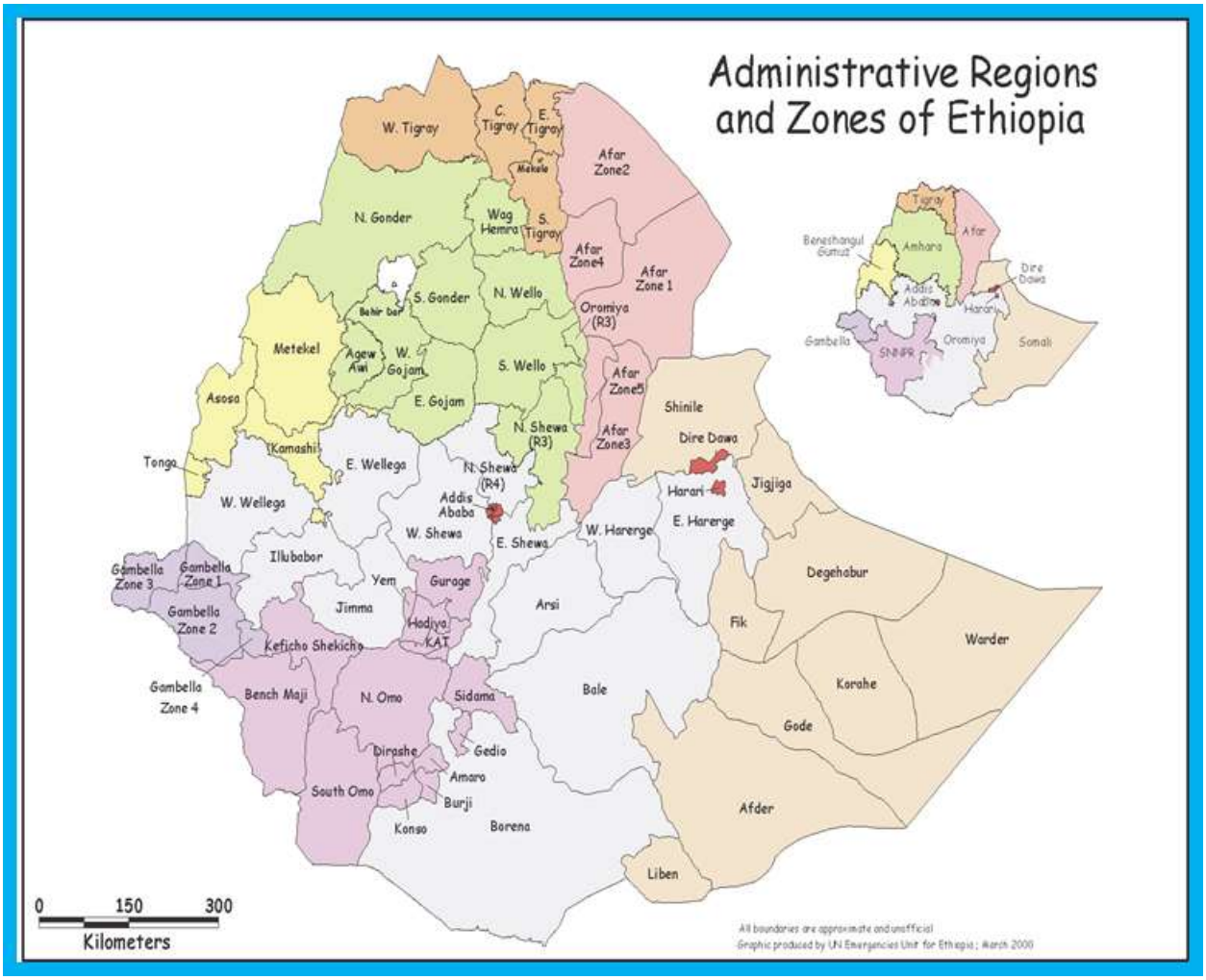
ONE WASH NATIONAL PROGRAM

A Multi-Sectoral SWAp

PHASE 2 Program Document

Second Draft

26 July 2018


Administrative Regions and Zones of Ethiopia
W. Tigray
C. Tigray
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Mekele
Afar Zone2
N. Gonder
Wag Hemra
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Afar Zone4
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Afder
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Kilometers
All boundaries are approximate and unofficial
Graphic produced by UN Emergencies Unit for Ethiopia ; March 2000
Tigray
Afar
Amhara
Beneshangul Gumuz
Dire Dawa
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Oromiya
Somali
SNNPR

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Disclaimer

This update document is based on the original 2013 main document, the present context, available resources, technology needs and approaches reinforcing the previous concepts and taking it forward with more pragmatic strategy and action plans. Thus, the content of this updated OWNP Phase 2 document are not only the creation of the consultants but has been prepared in full agreement with the OWNP Task Force and the wider stakeholders. However, any misquotes misrepresentation or opinions and other issues are the responsibilities of the consultants and not necessarily of the employing agency.

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Abbreviations and Acronyms

AAWSA	Addis Ababa Water and Sewerage Authority
AFD	Action for Development
AfDB	African Development Bank
AMREF	African Medical and Research Foundation
AWD	Acute Watery Diarrhea
BADEA	Arab Development Bank
BC	Behavior Change
BoFED	Bureau of Finance and Economic Development
BOQ	Bill of Quantities
BoWR	Bureau of Water Resources
CAP	Consolidated Annual WASH Plan
CCHSP	Community Centered Hygiene and Sanitation Program
CFT	Community Facilitation Team
CLTSH	Community-Led Total Sanitation and Hygiene
CMP	Community Managed Project
CSA	Central Statistical Agency
CSO	Civil Society Organization
CWA	Consolidated WASH Account
DAG	Development Assistance Group
DFID	Department for International Development (UK)
DRMFSS	Disaster Relief Management and Food Security Sector
EC	Ethiopian Calendar
EMIS	Education Management Information System
EPRU	Emergency Preparedness and Response Unit
EPRR	Emergency preparedness response and Recovery
ESA	Ethiopian Standards Authority
ESDP	Education Sector Development Program
ETB	Ethiopian Birr
EU	European Union
EWTI	Ethiopian Water Technology Institute (formerly EWTEC)
EWTF	Emergency WASH Task Force
FLOWS	Forum for Learning and Sharing on Water Supply and Sanitation
FMR	Financial Monitoring Report
FRA	Fiduciary Risk Assessment
FY	Fiscal Year
GDP	Gross Domestic Product
GIS	Geographic Information System
GOE	Government of Ethiopia
GLASS	Water global annual assessment of sanitation and drinking water
GLoWS	Guided Learning on Water and Sanitation
GPS	Global Positioning System
GTP	Growth and Transformation Plan
Ha	Hectare
HCS	Hararghe Catholic Secretariat
had	Health Development Army
HEP	Health Extension Program
HEW	Health Extension Worker
HH	Households
HMIS	Health Management Information System
HOAREC	Horn of Africa Regional Environmental Center
HP	Hand pump
HSC	Health Science College
HSDP	Health Sector Development Plan
IA	Implementing Agency
ICB	International Competitive Bidding
ICT	Information and Communication Technology
IFMIS	Integrated Financial Management Information System
IPP	Indigenous Peoples Plan
IP	Implementing Party
IRC	International Reference Center
IT	Information Technology
JICA	Japan International Cooperation Agency
JFA	Joint Financing Agreement
JMP	Joint Monitoring Program
JTR	Joint Technical Review
KPI	Key Performance Indicator
KWT	Kebele WASH Team
Lcpd	Liters per capita per day
MHM	Menstrual Hygiene Management
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MIS	Management Information System
MFI	Microfinance Institution
MOE	Ministry of Education
MOFEC	Ministry of Finance and Economic Cooperation
MOH	Ministry of Health
MOWIE	Ministry of Water Irrigation and Energy
MOU	Memorandum of Understanding
MoUDC	Ministry of Urban Development and Construction
MoANR	Ministry of Agriculture and Natural Resources
MoLF	Ministry of Livestock and Fishery

MoEFCC	Ministry of Environment Forest and Climate Change
MoFPDA	Ministry of Federal and Pastoralist development Affairs
MSF	Multi-Stakeholder Forum
MWA	Millennium Water Alliance
NBE	National Bank of Ethiopia
NCB	National Competitive Bidding
NGO	Non-government Organization
NWCO	National WASH Coordination Office
NWI	National WASH Inventory
NWTT	National WASH Technical Team
O&M	Operation and Maintenance
OCHA	Office for Coordination of Humanitarian Assistance
ODF	Open Defecation Free
OFAG	Office of Federal Auditor General
OWNP	One WASH National Program
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PCDP	Pastoralist Community Development Project
PDA	Personal Digital Assistant/Tablets
PFM	Public Financial Management
PMU	Program Management Unit
PoA	Power of Attorney
PTA	Parent Teacher Association
PV	Photovoltaic
QA	Quality Assurance
RiPPLE	Research-inspired Policy and Practice Learning in Ethiopia
RFP	Request for Proposals
RPF	Resettlement Policy Framework
RPS	Rural Pipe System
RWCO	Regional WASH Coordination Office
RWPMU	Regional WASH Program Management Unit
Sc/KDC	Sub-City/Kebele development Committee
SAP	Strategic Action Plan
SLTSH	School-led Total Sanitation and Hygiene
SNNPR	Southern Nations and Nationalities People's Republic
SNV	Netherlands Development Organization
SP	Service Provider
SSAP	Self-Supply Accelerated Program
SSWG	Self-Supply Working Group
SWAp	Sector wide Approach
TA	Technical Assistance
ToFED	Town Finance Office
TOR	Terms of Reference
TSG	Town Support Group
TVETC	Technical and Vocational Training College
TWB	Town Water Board
TWU	Town Water Utility
UAP	Universal Access Plan
UNESCO	United Nations Education, Science and Cultural Organization
UNICEF	United Nations Children's Fund
USD	United States Dollar
UWSSP	Urban Water Supply and Sanitation Project
WASH	Water, Sanitation and Hygiene
WASHCO	Water, Sanitation and Hygiene Committee
WASH MIS	Water, Sanitation and Hygiene Management Information System
WHO	World Health Organization
WIF	WASH Implementation Framework
WoFEC	Woreda Finance and Economic Cooperation
WPMU	WASH Program Management Unit
WRDF	Water Resources Development Fund
WSG	Woreda Support Group
WSP	Water and Sanitation Program (World Bank)
WSSP	Water Supply and Sanitation Project
WWT	Woreda WASH Team

Glossary

Advocacy - activities undertaken to persuade and mobilize people/decision makers to take action.

Behavior change - in hygiene and sanitation, behavior change refers to practicing safe disposal of feces through the construction and consistent use of improved latrines by all family members, hand washing with soap (or substitute) and water at critical times, and safe transport, treatment, storage and handling of household drinking water.

Borehole depths - The term "shallow" in Ethiopia is used to refer to a borehole up to about 60m in depth; "medium" depth refers to 60-150m; "deep" boreholes are drilled up to about 450m or more.

CLTSH - Community-Led Total Sanitation and Hygiene is Ethiopia's version of CLTS is a triggering tool to mobilize communities embark on construction of improved latrine and use, promotion of hand-Washing practices with soap (or substitute) and water at critical times, and safe water handling and treatment at the household level, are also addressed along with the drive to achieve ODF status.

CMP – Community Managed Project - WASH projects managed by trained and recognized WASHCOs with support from service providers such as MFIs.

Gender – the socially constructed definition of men and women, to be differentiated from sex, which is the biological characteristics of males and females and does not only refer to females. Gender is determined by tasks, functions and roles attributed to males and females in society and in public and private life.

Hygiene - practices associated with ensuring good health and cleanliness. This includes safe human excreta disposal (ODF), hand washing with soap at critical times most notably after defecation or before contact with food and strict observation of the safe drinking water chain.

Ignition (also called triggering) - the process wherein an outside facilitator mobilizes communities to take action to change their hygiene and sanitation behavior.

Improved drinking water supply- Water supply system such as -well or bore hole or protected spring, protected dug well and rain water-collection, properly constructed, treated and piped into dwelling yard or plot, public tap, or standpipe, tube

Improved Sanitation Facility - A sanitation system that is safe, clean and cleanable, sealed to discourage exposure to the flies, other animals and the environment as well as promote dignity and privacy.

Joint Technical Review - a semi-annual review process that brings together the government and major WASH Development Partners to review program implementation including progress and challenges. These reviews provide an excellent opportunity for "big picture" learning and strategic problem solving

Model Household - a household that fulfils at least 11 of the 16 HEP packages that include access to and use of latrine, preparation of waste water seepage pits, hand Washing, water storage and treatment facilities.

Multi-Stakeholder Forum - an annual event that brings together stakeholders from government (including representatives from the four signatory Ministries), Development Partners, civil society organizations, and the private sector to review progress in the WASH sector and to agree on key strategic undertakings to be jointly pursued during the year ahead. The MSF is designed to improve communication between stakeholders, as well as supporting the mutual objectives of coordination, harmonization and alignment among partners across the implementing sectors

Offsite Sanitation. A water-borne sanitation system linked to a sewer or septic tank/cesspool whereby the sludge deposit of human excreta is pumped or otherwise transferred to a treatment system at a different location.

Onsite Sanitation - A sanitation system whereby excreta are contained at the same location as the toilet; either in a pit, chamber, vault or septic tank.

Open defecation free (ODF) - an environment wherein no feces is openly exposed to the air. It describes a state in which all community members practice use of latrine at all times and a situation wherein no open defecation is practiced at all. ODF is a term used in CLTSH to describe the attainment of 100 percent latrine coverage and use by all families in a village, including small children.

Procurement "contract": WASH program Consultancy, Goods and Works legally binding procurement arrangement entered into on behalf of the region, Woreda and or Zone. This can range from a very formal and structured contractual agreement document, to a hardcopy for electronic for service, contract and purchase order, to a binding verbal commitment, and so on.

Pre-ignition/triggering - A process comprises preparations made to mobilize villagers. Pre-ignition activities include a strategic selection of kebeles and villages, meeting local gatekeepers and fixing appropriate date, time & place for community ignition.

Resettlement Area – An area where people have been recently resettled as a result of actions by government agencies or private entities for agricultural, industrial or infrastructure development.

Sanitation Action Plan SAP –A plan to promote or activate sanitation program in rural and urban areas and in domestic and institutional settings.as well as hand Washing and safe drinking water handling in the home. The urban aspects of the SAP address peri-urban areas, small towns and informal settlements where on-site solutions can be applied.

Social/ Sanitation marketing - an approach that focuses on improving formal and informal supply chains, products and services to expand the delivery of affordable basic sanitation, coupled with the application of commercial marketing techniques to stimulate demand to increase the number of households investing their own resources to build and maintain an improved sanitation facility.

Safe water: Safe water is that drinking water which is free from pathogenic organisms, toxic substances, an over dose of minerals and organic materials as well as that with pleasant taste, free of color, turbidity and odor.

Safe water chain - Protecting water at the source is the first critical step in a multiple-barrier approach including application of household water transport, point of use treatment and safe storage of drinking water until consumption.

Safe water management – The protection of water at source, operation and management of systems and management of drinking water at home (including the practices of household water treatment, safe storage and use).

Self-Supply - Improvement to water supplies developed largely or wholly through user investment by households or small groups of households". Self-supply involves households taking the lead in their own development and investing in the construction, upgrading and maintenance of their own water sources, lifting devices and storage facilities. A key characteristic of Self Supply is the ladder of incremental improvements in steps that are easily replicable and affordable to users, linked when necessary to microfinance and/or water from productive use.

Sub-city/Kebele Development Committee - The Sc/KDC is an institution that will be engaged in WASH activities in its respective Sub-city or Kebele. The composition is: Representative of Kebele administration, Health Extension Worker, School community members, representatives of youth and women associations

Total sanitation - A situation where no open defecation is practiced and in which the cycle of fecal contamination through vectors including flies, fingers, animals, feet, wind, flood and rain runoff has been broken.

Town/City WASH Steering Committee (T/CWSC) - The Town/City cabinet serves as the WASH Steering Committee.

Town/City Water Board (T/CWB) - The T/CWB is established as per regional proclamations and functions as the board of management for town/city water supply and sewerage (liquid waste management) services. In most instances, the Utility Manager is a member of the Board and serves as Board Secretary.

Town/City WASH Technical Team (T/CWTT) - The T/CWTT is established by the town/city administration or town/city WASH Steering Committee and consists of mainly representative from the town/city administration (municipality),

the Water Board, Town's Finance and Economic Development, utility for WSS, health and education desk personnel. The Chairperson is designated by the establishing authority.

Water Supply and Sewerage Utilities (WSSU) - The WSSU is an existing institution that is responsible for the day-to-day operation and management of water supply and liquid waste management systems.

Unimproved water supply - use of unprotected dug well, unprotected spring, cart with small tank, or drum, tanker truck, surface water (river, Dam, Lake, pond, stream, canal, irrigation, and channel).

Unimproved sanitation facility - A fixed point traditional latrine system made from local materials with an unsustainable feature and that which does not satisfy the criteria for an improved sanitation facility.

Verification - a process of endorsing that a given Village/Kebele/Community is totally free of open defecation practices (ODF).

WASH Strategic Plan - The WASH Strategic Plan sets out woreda strategies, targets and schedules for achieving WASH coverage over a 5-year period.

WASH Annual Planned Budget - The Annual WASH Plan sets out the specific activities, outputs and expenditures for the year ahead. It incorporates the planned WASH activities, investments and targets of all WASH implementers – including other government programs, and the programs of NGOs that are active in the sector. The Woreda WASH Budget includes funds coming to, or allocated by, the Woreda Administration for WASH activities.

Water Quality Monitoring - systematic verification of water quality standards through laboratory/or spot analysis of samples taken at critical points of the water supply system.

Water Quality Surveillance - watching and protecting drinking water from potential source of contamination through sanitary survey and water quality analysis of samples taken at different points.

1. Executive Summary

Since the One WASH National Program (OWNP) is a continuous long-term government plan, this document reproduces many sections from the OWNP document 2013 that are still relevant, updated where needed, for a complete and independent document. However, the WASH environment in Ethiopia is rapidly changing and has many challenges, many of those challenges are multi-sectoral and complex.

In order to address those challenges and to meet the extremely useful feedback received through extensive stakeholder consultation, then significant extra material, including detailed analysis of available data, has been added to make the document as comprehensive as possible.

The development objectives of the One WASH National Program (OWNP), which started to operationalize in 2013, is to contribute towards improving the health, well-being and economic activity of both rural and urban populations by increasing water supply and sanitation access and the adoption of good hygiene practices in an equitable and sustainable manner, initially in line with the GTP 2010-2015.

The program was designed in two phases to complete GTP I and II. Phase II is now designed using GTP II Goals, strategic objectives with indicators for water, sanitation, hygiene and institution WASH. GTP II consist of 21 goals and 4 strategic objectives for water including: Increase safe water supply upgrading the service level and improve urban waste water management system; ensure good governance in rural water supply enhancing sustainability, effectiveness, efficiency; climate change resilience of the services; and building the sub-sectors capacity.

It is now considered that the OWNP has become more complex, with more and more multi-sector interfaces, and will benefit from an overall 10 to 15-year strategy. The purpose is to provide a strategic approach to reaching OWNP objectives based on an in-depth analysis of internal factors and external influences such as 1) the 2013 OWNP document, 2) WIF document, 3) GTPII goals and indicators, 4) OWNP Phase I review report, 5) SDG indicators and 6) challenges that are influencing integrated WASH approaches for sustainability.

As per the forecast made by CSA, the Ethiopian population is growing at an average rate of 2.6 percent per year implying that with this rate the population may exceed 130 million by 2030 (CSA, 2013) which would directly influence water and sanitation demand. The urban population is growing at a rate of 5 percent with doubling time to be only fifteen years. New job opportunities in the services sector, construction, and industry are believed to hasten the rural urban migration contributing to the increment on the number of small towns from 534 in 1994 to about 973 in 2011.[1]

An MOWIE 2017 report indicates that the average national rural and urban water supply coverage is reported to have reached 68% and 55% respectively, benefiting 51.8 million rural and 10.6 million urban residents.

The GTP II targets for water supply are 85% and 75% for rural and urban areas respectively. Following from this, the OWNP Phase 2 short to medium-term objectives (2 to 7 years) are to fulfil the GTP2 targets (currently set for the period 2016 -2020):

- By 2020, provide safe and adequate water supply to rural communities with minimum service level of 25 l/c/d within a distance of 1 km from the water delivery point. Coverage to reach 85 % of the rural population of which 20% is with Rural Pipe Systems.

[1] Background paper for water resource management policy review, Draft, 2017

- Percent of towns/cities provided with 100 l/c/d for Category 1 town/cities; 80 l/c/d for Category 2 town cities; 60 l/c/day for Category 3; 50 l/c/d for Category 4; (all up to the premises) and 40 l/c/d for Category 5 towns within a distance of 250m with piped system; Coverage of 75% of the urban population.
- Decrease rural water supply schemes non-functionality rate from 11.2% to 7%.
- Decrease urban Non-Revenue Water (NRW) from 39% to 20% for urban water supply utilities in Category 1 to 3 towns/cities.

GTP II did not include sanitation, hygiene and institutional targets, goals and strategic objectives. Instead, the development of Phase II OWNP targets, goals and objectives set in the NHEHS and school WASH strategy are adopted. The sanitation and hygiene targets are indicated in the NHEHS as 82% for sanitation, ODF, and hand Washing.

Achieving GTP II targets and universal coverage means that an additional 20,410,759 million rural and 5,648,901 million urban population as well as 16,026 primary schools, 1788 high schools and secondary schools, 1054 health centers and 7253 health posts will gain access to safe drinking water and sanitation services.

The target set and overall existing situation may demand and call for a pragmatic program to make available adequate and safe water supply, mobilize communities for a sustainable and improved sanitation and hygiene services to all people in Ethiopia. In addition, inadequately served and drought prone pastoralist communities demand a robust and climate resilient water and sanitation services.

In the process of designing the OWNP Phase II, average unit rates and population served for each technology type in use and proposed for each region have been calculated from available data. An interactive spread sheet tool has been developed to allow any combination of technology type, regional population served and regional WASH budget.

The tool has been used to adjust regional proposals to reach GTP2 targets and to allow for a shift towards more sustainable technology mix. The resulting cost for the short to medium term work is estimated at USD 6.5 billion, of which USD 2 billion will be for the first stage CR-WASH[2] interventions.

An indicative long-term plan beyond 2020 is also included taking into consideration the ambition to achieve SDGs for basic and safely managed water supply for rural and urban areas. Annual expenditure to achieve SDGs (or equivalent Ethiopia standard) by 2030 is estimated at between USD 1.3 and 1.8 billion per year.

The required long-term activities will be continuation, establishment and formalization of the short to medium term actions in order to create a robust water and sanitation sector able to meet the needs of urban and rural WASH in Ethiopia. The continuity process may be described through “short to medium term” actions, leading into long term goals as listed in the **Table 1.1** below. It is anticipated that the OWNP Strategy (**Section 7**), the short to medium term recommendations (**Section 9**) and long-term recommendations (**Section 10**) included in this document will form the basis for WASH GTP3 (2021-2025) and GTP4 (2026-2030) formulation.

The sector breakdown of funding required achieving the GTP II water supply, sanitation and hygiene targets is depicted for the five program components in the figure below and described in detail in **Section 16**.

[2] *Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia* ALL projects need to be climate resilient, not just those in arid areas

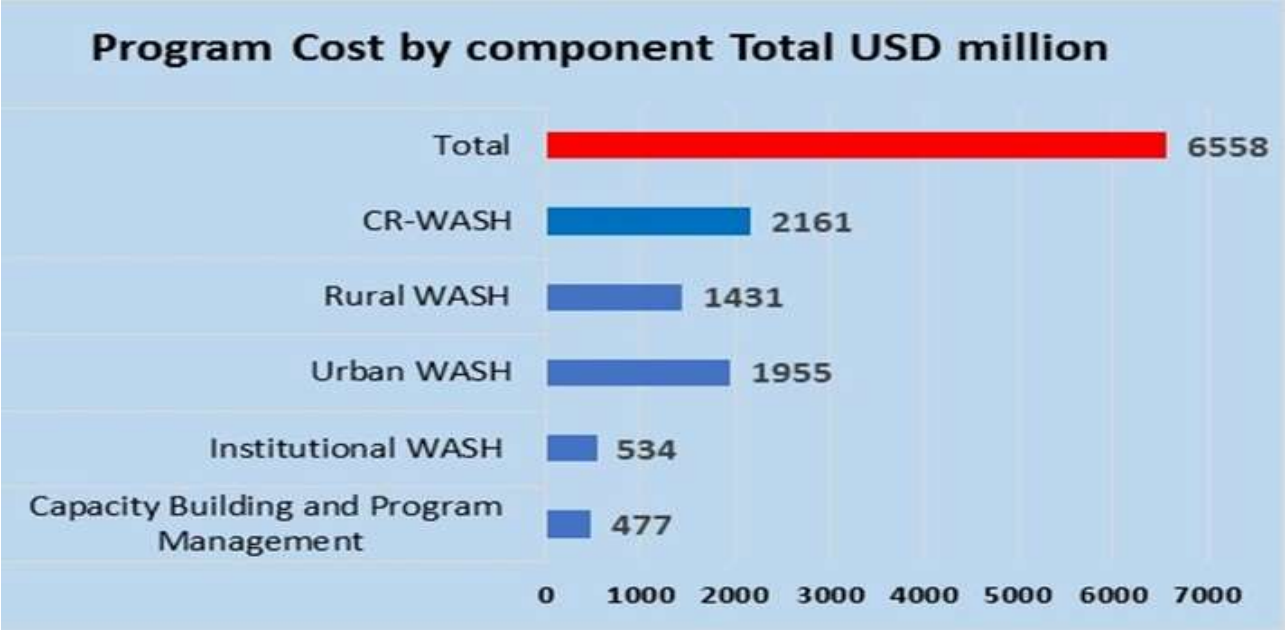


Figure 1-1: Program Cost by Component

Budget distribution for WASH components

The physical plan for both urban and rural areas is designed using the regional plans but recalculating population and technology mix using predesigned unit rates. For rural water supply, 6,432 self-supply, 52,594 spot supply systems (varies from hand dug well to shallow well and deep BH spot supply pumped with solar energy), 4,097 piped water supply systems focused more on resilient water source and multi-village water supply systems.

In the remaining GTP II period it is proposed to focus more on total 5,871 rehabilitation schemes which are planned to meet the target to reduce non-functionality rate to 7%. Regarding urban water supply, 280 new water supply projects are proposed, mainly focused on small towns in Categories 4 and 5.

The urban rehabilitation and expansion program will focus on 976 Category 1 to 3 towns: The aim will be to reduce NRW from an average of 39% to 20% in each town (the GTP II plan) and works expansion to meet unserved urban residents. See details in **Section 16** and in the **Annexes 1 to 4.**

To achieve the GTP targets in a short timeframe will be very dependent upon (among other things): much greater sector capacity; involvement of a much stronger NWCO and RWCO; a more facilitated and streamlined fund distribution system, to ensure the smooth flow of funds; fast-track procurement processes; contracting of consultants, suppliers and contractor at scale (large packages) and on an international procurement basis; timely availability of adequate financial resources; and appropriate systems in place to track implementation progress and fund utilization,

An indicative strategy action plans (SAP) for WASH is included to provide a roadmap for accomplishing specified GTP2 goals including activities for each goal and anticipated results. The SAP is also designed using the anticipated results, core activities, indicators and time lines for water: The same SAP design is similarly applied for sanitation and hygiene and institutions.

The short to medium term summery recommendations (detail section 9) are depicted in the following table.

Table 1-1 High level actions and goals, short to long term

S No	Subject	Short to medium term actions	*Moving towards* long term goals
1	Water Resources	Accelerated hydrological and hydrogeological mapping. Development of water resource master plans under WRM multi-sector activities, including CR-WASH	Full monitoring and control and sustainable exploitation of surface and groundwater. WASH fully incorporated in water resource master plans under WRM multi-sector activities.
2	Technology innovation and mix	Technology shift to reduce failure rates, improve resilience in the face of changing climate, demographic shifts, environmental impact of rapid urban, industrial and agricultural development, arid area encroachment, refugee areas, competition for limited water resources, etc. Include "risk-informed planning"[3] and tailor to meet the diverse needs within Ethiopia.	Fully sustainable and optimised water and sanitation technology mix resilient against climate change, demographic shifts, rapid urbanization, impact of industrial and agricultural development, arid area encroachment, and taking into account refugee areas, competition for limited water resources, highland areas, arid zones, etc.
3	Procurement and implementation	Streamlined procedures, contracting at scale involving international tendering and supply chains. Maximum use of national manufacturers, suppliers and contractors, while not precluding international suppliers and competition. Promotion of international/national collaboration, learning from procurement models such as 8 towns work (UNICEF/DFID).	Established and efficient procurement, supply chain and implementation procedures with maximum use of national manufacturers, suppliers and contractors, while not precluding international suppliers and competition. Full contract compliance and professional contract management carried out under guidelines.
4	Capacity development	Capacity development for improved delivery of WASH services at all levels including high level of services from water utilities, strengthening NWCO and RWCOs and forming Zonal WASH Coordination Offices. Develop efficient Program Communication Strategy and sharing of good/best practice.	Fully developed capacity in terms of public and private WASH skills, water abstraction licensing, safe water quality monitoring in all towns and villages supported by sufficient accredited laboratories throughout each region, monitored and enforced pollution control (both dispersed and point source).
5	Clustering	Voluntary clustering for economy of scale, improved O&M and use of national	Established national/regional utility regulation. Formal country wide clustering - it

[3] UNICEF term

S No	Subject	Short to medium term actions	*Moving towards* long term goals
		/international KPIs for urban large and small towns, satellite villages and MVWS schemes; ahead of formal sector reform..	is anticipated that there could be around 100 publicly owned utilities with each including large and small towns, satellite villages and MVWS schemes and responsible for water supply, sanitation and solid waste.
6	Advocacy	BCC for water security, sanitation awareness and hygiene; engagement at all levels (government, utilities, DPs, CSOs, private sector, communities) and learning from refugee areas water safety and sanitation procedures to inform overall rural and urban WASH practices. Introduction of sanitation micro-plans[4].	Fully established advocacy procedures for water security, sanitation and hygiene. Responsible engagement at all levels (government, utilities, DPs, CSOs, private sector). Full community engagement with safe rural water and hygienic sanitation practices.
7	Emergency WASH and CR-WASH	Phased replacement of Emergency WASH with CR-WASH[5] moving towards Emergency WASH being reserved for unpredictable occurrences, not regular drought and flood cycles. Development of Emergency, Preparedness, Response and Recovery (EPRR) procedures.	Emergency WASH reserved for unpredictable occurrences (extreme drought, flood, rapid population shifts, etc.) Fully developed and implemented Emergency, Preparedness, and Response and Recovery (EPRR) procedures.
8	Sustainability feasibility studies	Sustainable development studies and designs; affordability and appropriate levels of water and sanitation services, environmental and health impact, urban sanitation, rural water and hygiene, arid areas.	Water supply systems based on resource studies, proven business models, economy of scale, service standards, community engagement, etc. Complete integration of urban sanitation and environmental protection, including SWM, industrial solid and liquid wastes.
9	Urban planning	Enforcement of planning and shift towards watershed management and catchment protection.	Full enforcement of urban, rural and industrial physical plans that include comprehensive watershed management and protection.
10	Technical assistance	TA (including post-construction) units at regional level with sub-offices distributed at approx. zonal level (to coincide or pre-empt clustered utilities) to support both urban and rural WASH development and operation, including on-the-job training.	Fully functioning and sufficient TA units so as to ensure rapid WASH development, value for money, sustainable business models, etc.

[4] Currently being developed under UNICEF leadership but not yet published
[5] Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia

S No	Subject	Short to medium term actions	*Moving towards* long term goals
11	Sector budgets	Ring-fenced sector CAPEX and OPEX budgets for WASH in schools and health facilities; water supply and sanitation services to/from property boundary increasingly becoming obligation of utility or WASHCO.	All construction and operation of facilities within schools and health facilities (including retro-fit of existing buildings) fully covered by sector budgets. Water supply and sanitation services to/from property boundary being obligation of utility or WASHCO.
12	Multi-sector	Multi-sector cooperation to ensure long-term sustainable water resources, recycling and re-use, pollution control, etc.	Inclusion of all relevant water resources, sanitation and environmental related ministries in the OWNP WIF, through WRM initiatives or through other formal agreement.
13	Monitoring and evaluation	Updated regional WASH inventories of installed systems, planned systems and data storage and dissemination. MOWIE MIS established	Regional WASH inventories and data storage and dissemination. Comprehensive and fully implemented WASH data base and updating systems.

2. Introduction and Background

2.1 Introduction

This Program Document has been prepared with the support of the Government of Ethiopia and is intended to serve as a guide to implementing the OWNP, hereafter referred to as the Program. This document is not in itself a detailed implementation manual but provides strategy, plans and guidelines to achieve immediate GTP II targets and an outline strategy to achieve SDG targets in the medium to long term.

The Program provides the framework for harmonizing Government and donor approaches to planning, procurement, implementation and financing and serves as the platform on which a closer partnership between planners, implementers, development partners and others to achieve common goals can be built.

2.2 The Global Context

Although a significant change was recorded globally during the Millennium Development Goal (MDG) period, the effort was not fully successful, particularly with respect to sanitation. For this reason, the global program for WASH services has been developed and extended to 2030 through the introduction of Sustainable Development Goals (SDGs), superseding the MDGs and involving 17 goals and 169 targets.

SDG 6 aims to 'Ensure availability and sustainable management of water and sanitation for all' and includes three technical targets relating to:

a) **Drinking water** (**Target 6.1);** "by 2030, achieve universal and equitable access to safe and affordable drinking water for all"
b) **sanitation and hygiene** (**Target 6.2);** "by 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations"
c) **wastewater management** (**Target 6.3**); "by 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally"

The 2030 global agenda for water and sanitation services goes beyond the WASH sector to support the achievement of other SDG targets through WASH services (**Table 2.1**).

Table 2-1: SDG Goals supported by WASH

Goals	SDG targets
Reducing poverty and achieving universal access to basic services. Ending all forms of malnutrition	2.2
Ending preventable child deaths, combating neglected tropical diseases and waterborne diseases, and achieving universal health coverage	3.2, 3.3, 3.8, 3.9
Providing safe and inclusive learning environments	4a
Ending violence against women and girls and reducing gender inequality	5.2, 5.4
Ensuring adequate, safe and affordable housing for all	11.1
Reducing deaths caused by disasters[6]	11.5

[6]United Nations General Assembly, 'Resolution adopted by the General Assembly on 25 September 2015: 70/1. Transforming our world: The 2030 Agenda for Sustainable Development', A/RES/70/1, 21 October 2015, <www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E>

During the MDG period, global monitoring focused on access to drinking water, sanitation and hygiene at the household level. While household access remains the primary concern, the SDG program includes institutional (schools, health care facilities and workplaces). The SDG targets 6.1 and 6.2 referring to 'universal access' and 'for all' further reinforces the importance of WASH in all settings, not only the household.

Government of Ethiopia has a plan to join the lower middle-income countries by 2025, which has become an added driving force for the water supply and sanitation sub sector.

As stated in several studies, the supply of improved water hygiene and sanitation facilities (WASH) not only facilitates health and values (dignity, equity, compassion, solidarity and respect) but also contributes in economic and financial savings such as in reducing absence from work, health care costs, protecting the environment and reducing time spent collecting and transporting water. A study by WHO[7] revealed that each USD 1 invested in WASH would yield an economic return of between USD 3 and USD 34.

2.3 The National Context on WASH

According to the National WASH Inventory (NWI)[8], in 2011 national access to water supply was a little over 50% and to sanitation was a little over 60%. By 2015, it was estimated that national access to water supply had increased to 67%, meeting the MDG targets. However, sanitation MDGs were not met; according to studies by EDHS in 2016, the improved sanitation access for Ethiopia is very low. Millions of Ethiopians still lack improved water and basic sanitation facilities, and very few people regularly WASH their hands with soap and water at critical times.

Water supply, sanitation and hygiene should be addressed as integrated packages and Government is committed to implementing a Sector Wide Approach (SWAp) through the One WASH National Program, supported by a number of Development Partners and NGOs.

GoE has sets out its development goals in successive Growth and Transformation Plans (GTPs), which identify water and sanitation as priority areas for achieving sustainable growth and poverty reduction. In line with the second GTP (GTPII), which covers the period 2016-2020, GoE has prepared a Universal Access Plan (UAP), with the following targets:

- Provide rural water supply access with GTP II minimum service level of 25 l/c/d within a distance of 1 km from the water delivery point for 85% of the rural population of which 20% are provided with RPS.
- Provide water supply access for 75% of the urban population with GTP II minimum service level of 100 l/c/d for Category 1 towns/cities, 80 l/c/d for Category 2 towns/cities, 60 l/c/d for Category 3 towns, 50 l/c/d for category 4 towns (all piped up to the premises) and 40 l/c/d for category 5 towns within a distance of 250 meters with piped system.
- Carry out studies and designs of urban waste water management for 36 category 1, 2 and 3 towns/cities and build waste water management systems for 6 towns /cities with populations of 200,000 or more.
- Decrease rural water supply schemes non-functionality rates to 7% and decrease NRW to 20%.

[7] See <www.who.int/water_sanitation_health/monitoring/investments/glaas/en

[8] The National WASH Inventory is described in more detail in Section 15.

To facilitate achievement of the GTP and UAP targets, GoE has prepared a WASH Implementation Framework (WIF) to provide guidance for implementing the Program and also defines the roles and responsibilities of major stakeholders in the WASH sector.

2.4 Policy and Program Initiatives

The Ministry of Water Irrigation \and Electricity has introduced policies, legislation and strategies such as National Water Resource Management Policy (1998), Water Sector Strategy (2000), Water Sector Development Program (2002), Water and Sanitation Access Plan (UAP) (2005), Memorandum of Understanding signed by three sector ministers (MoU, 2006) and a revised MoU, signed by four sector ministers in November 2012. MoWIE has also prepared guidelines for gender mainstreaming in the water and energy sectors (2012).

Health Sector Development Programs (HSDP I, II, III and IV) in line with the Plan for Accelerated and Sustained Development to End Poverty (PASDEP), and now the Growth and Transformation Plan of 2011-2015 (GTP I) and 2015-2020 (GTP II) has been introduced to address the water, hygiene and sanitation problems of the country. One of the main innovations of the HSDP has been the Health Extension Program (HEP) that aims to reach universal coverage of primary health care and improve the quality of health services in rural areas and partly in the urban areas

2.5 Demographics

The Ethiopian rural population is estimated at 75M (in 2017) growing at an average rate of 1.8 percent per year and urban population is estimated at 19 million (in 2017) growing at an estimated 5.0% (see tables in **Annex 1**), According to CSA 2013, the total population may exceed 130 million by 2030. New job opportunities in the services sector, construction, and industry are believed to be hastening the rural urban migration. One effect of this is the number of villages increasing in size to small towns category; from 534 small towns in 1994 to about 973 in 2011.[9]

2.6 Evolution of the One WASH National Program

The evolution of the One WASH Program in Ethiopia has followed three phases as follows:

1) WASH activities prior to 2004

Prior to 2004 WASH, interventions were project-based, and there was limited integration between water supply, sanitation and hygiene and little enabling conditions to integrate these three sub sectors. Community and women's participation was low; private sector participation and government implementation capacity was also very low during this period.

2) From 2004 to present

Since 2004, WASH implementation has become program-based and is in line with the decentralization process. The Government's financing for WASH activities has considerably increased during this period. However, implementing WASH activities in Ethiopia face a number of challenges: For instance, activities are not fully harmonized, as some NGOs and other organizations are implementing WASH projects as a free service without community or user contributions and fulfilling individual donor's financial and procurement procedures are difficult and time consuming.

[9] Background paper for water resource management policy review, Draft, 2017

3) The One WASH National Program

To address the challenges faced by the WASH sector, the Government initiated and supported the establishment of the One WASH National Program, functional since 2013. The Water Implementation Framework (WIF) provides the framework[10] and guidelines for implementing the Program, which is in turn based on the Growth and Transformation Plan (GTP).

During Phase II the Program will follow GTP II plans and targets and will also address activities that were not fully addressed in Phase I: Some of the significant areas which need further strengthening are capacity building, bringing all NGOs working in WASH to be more aligned with the OWNP and enhancing joint participatory planning practices at all levels.

The cornerstone of the Program is the Consolidated Annual WASH Plan (CAP), which includes a budget. Progress in achieving the plan goals are reported in quarterly and annual progress and utilization reports at federal, regional, city, zone, woreda and town levels. It is expected that donor funding will, to an increasing extent, be channeled through the Consolidated WASH Account (CWA) under Phase II.

2.7. OWNP Phase 2 development process

The process to arrive at the OWNP Phase 2 recommendations may be represented by the following schematic. Note that this document represents **Step 12.**

The process has fully involved stakeholders as indicated in Steps 4, 5, 6 and 7 (as well as at different draft report stages). Stakeholders will be engaged again during steps 14, 15, 16 and so on through the iterative cycle following issue of the final version of this document. This allows for future assessment (Steps 14 and 15) of the consequences of selected solutions, especially financial and capacity/institutional implications

Steps 8, 9, 10, 11 and 12 have involved rigorous analysis of available data and development of an interactive spreadsheet tool (principally for rural water) that will be available for use by all regions, DPs, CSOs and other interested parties. Users will be able to adjust targets to meet available budgets and vary technology mix to improve reliability and sustainability according to current “state-of-the-art” in each region or geographical zone.

One outcome of the stakeholder reviews (Steps 14 and 15) is likely to be that timescale targets are too ambitious and that the strategy will need some adjustments (Step 16). However, Section 9 of this document pre-empts this situation by identifying “short to medium term” activities that are required to meet GTP2 outputs, irrespective of actual period of implementation.

Similarly, if timescales are stretched, then budgets identified in **Section 16** of this document will remain valid except for; (1) escalation figures which will need adjustment if implementation period is extended and (2) technology mix which could be more ambitious towards reliability and sustainability if more time is available for development and implementation.

[10] Establishing the organization; defining the roles and responsibilities of sectors and partners; creation of a consolidated WASH account; planning, budgeting, distribution of fund, procurement; and reporting mechanisms

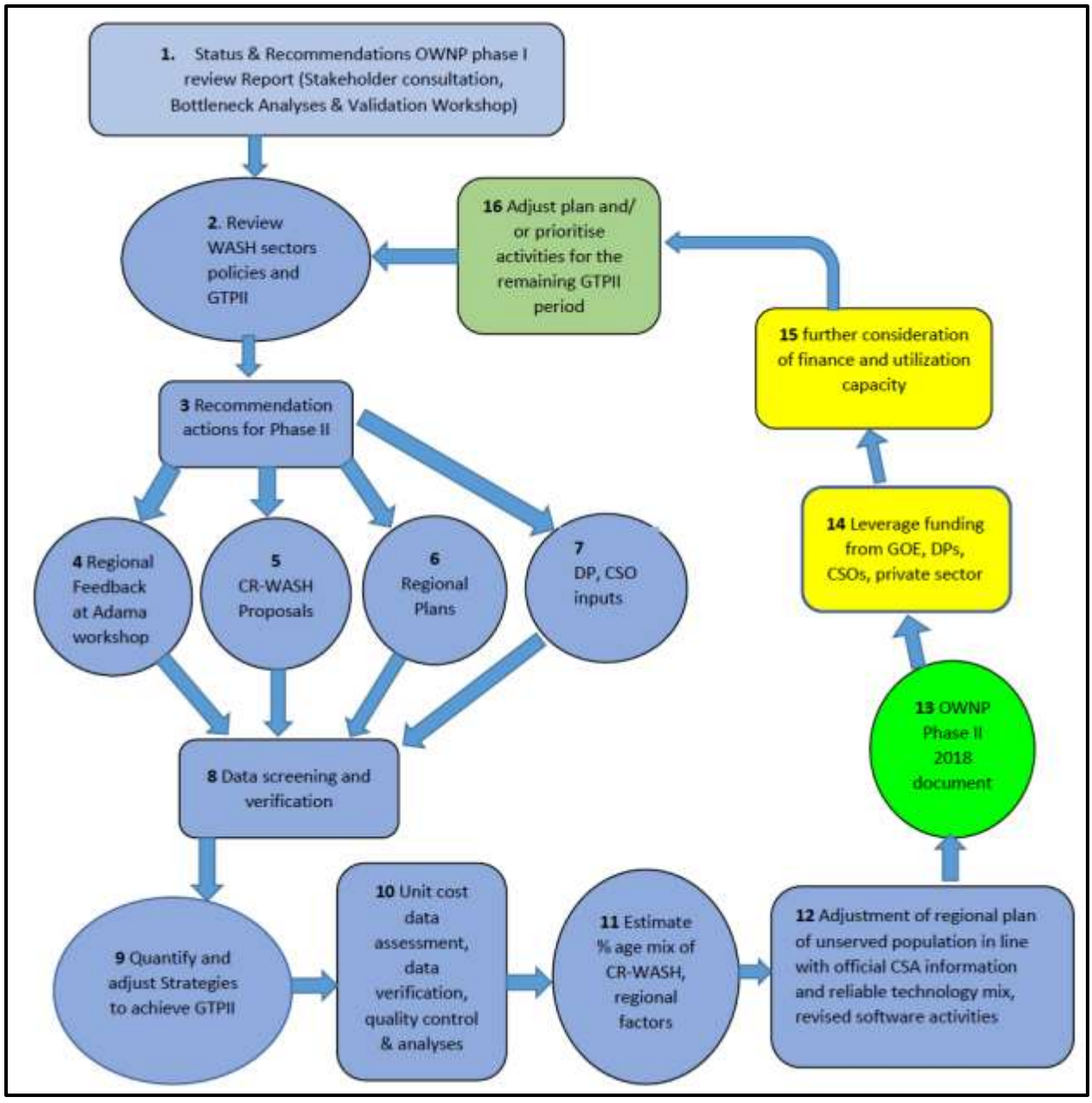


Figure 2-1: OWNP Phase 2 development process

3 Program Description

3.1 Introduction

The Program makes use of the First Phase Review Report of 2017, updated strategies, plan and guidelines since 2013 to establish a baseline for access to rural and urban water supply and sanitation and to plan short and long-term developments to meet immediate GTPII targets and longer-term SDG goals.

3.2 Program Objectives

The Program's Development objective is to contribute to improving the health and well-being of population in rural and urban areas by increasing sustainable and climate resilient water supply and sanitation access and the adoption of good hygiene practices. The long-term objective is, by 2030, to achieve universal, sustainable, climate resilient and equitable access to safe and affordable water for all along with improved low environmental impact sanitation.

The intermediate objective of the Program is to achieve increased and sustained coverage of safely managed water supply and sanitation in rural and urban areas. The short-term objective of the Program is to achieve increased and sustained coverage of water supply and sanitation in rural and urban areas with basic water supply and sanitation service levels in Ethiopia in line with the GTPII targets (2015-2020).

3.3 Guiding Principles

The Program is guided by the Memorandum of Understanding (MoU) and WASH Implementation Framework (WIF), signed by the Federal Ministries of Water Irrigation and Electricity, Health, Education and Finance and Economic Cooperation. The following four guiding principles of the Program as stated in these documents are:

1. Integration of water, health, education and finance
2. Alignment of partners' planning and management systems and procedures with those of GOE
3. Harmonization of partners' approaches and activities
4. Partnership between implementing parties

3.4 Program Pillars

The Program's activities are organized around three domains or pillars:

1. Enabling Environment and Good Governance form the foundation and prerequisite for the Program's success. It includes legal instruments, policies, strategies and frameworks, institutional arrangements, program methodology, implementation capacity, availability of products and tools, finance, cost effective implementation and M&E, formal agreements, the commitment and integrity of personnel at all levels and access to information. This pillar also includes compliance with agreed norms and standards, establishing WASHCOs as legal entities and contractual relations between implementing parties.
2. Maximizing availability and efficient use of human and financial resources to create demand for better WASH services: The emphasis is on efficient use of resources rather than only the availability of resources. During consultations with the regions and cities, human resources and capacity were mentioned more frequently than funding and other resources as constraints to effective implementation of WASH activities on the ground.
3. Capacity development for improved delivery of WASH services: Capacity gaps at all levels have been identified as one of the most pervasive threats to the successful implementation of the Program. Therefore, capacity

development of IPs at all levels will receive priority attention by the Program. The Program will continue to support the development of human resources, organizations and systems and logistics and equipment.

There has been some success with establishing the three pillars supporting efforts towards coverage of improved water, hygiene and sanitation services across Ethiopia, but efforts should be quadrupled in order to bridge the widening gap between current situation and targets. For instance, it is indicated in Section 16 that around USD 6.5 billion will be required to achieve GTP2 WASH targets while current absorption capacity is only around USD 0.5 billion per year.

3.5 Phasing

In Phase II the Program focuses on newly developed strategies, directives, and indicators in GTP II. The program also looks beyond GTPII to establish sector reform and towards meeting SDGs.

The components of OWNP Phase 2 include rural water supply, sanitation and hygiene (rural WASH), urban water supply, sanitation and hygiene promotion (urban WASH), institutional WASH, program management and capacity building and WASH in emergencies/resilient and sustainable WASH (CR-WASH).

There will be a greater emphasis on sustainable and resilient technologies. The type of technologies used for water supply especially in rural areas may have to be diversified and simplified with sustainability in mind. The focus only on wells/pumps and capping springs has limited the potentials of other technologies and the use of other water resources such as surface water and rainwater harvesting.

Consideration has been given to broadening the Program's scope to include such related activities as watershed and water resources management, productive uses of water, environmental protection, climate resilience, WASH in emergency, etc. as agreed during Phase I review with stakeholders.

Timescale to meet targets may be constrained by funding but equally by funding absorption capacity. Hence an interactive tool is presented which enables decision makers to balance activities with targets and available resources and to increase the level of sustainable technology (see **Sub-section 9.3**).

3.6 Preliminary Risk Assessment

Major risks that may affect achievement of the Program's development objective and results are summarized in the following table, along with measures for minimizing or mitigating the identified risks. Although a lot of improvement is being recorded, there are still a number of vital program areas which need further improvement. These importantly include the need for continuous improvement of the quality of study, design, contract management and supervision, improvement in timely financial reporting and ensuring that cash balances and advances are sufficient for timely implementation.

Table 3-1: Preliminary Program Risk Assessment[11]

Description of risk	Proposed Mitigation Measures	Rating
Targets may not be achieved due to time, availability of funding and capacity constraints, including those in the private sector	• Program interventions should target unserved areas, prioritize providing basic levels of service and strive to control unit and per capita costs • Enhanced and focused capacity building training to private and public-sector staff so that more can be done with limited amount of resources and time	S
Weak implementation capacity which is witnessed by the number of years a project is taking to complete	• Link local contractors and consultants with experienced and efficient international contractors • TA (including post-construction) units at regional level with sub-offices distributed at approx. zonal level (to coincide or pre-empt clustered utilities) to support both urban and rural WASH development and operation, including on-the-job training: • Regional units will have specialist knowledge of renewable energy, sustainable resources, deep well drilling, ICB and local contract management, sustainability feasibility studies (including financial analysis), Build Capacity Build and Transfer (BCBT), Build Operate Transfer (BOT), etc.	S
Weak, unorganized and unsupported operation and maintenance system	• Trained maintenance crews with stocks of spare parts • As above, TA (including post-construction) units at regional level with sub-offices distributed at approx. zonal level • Streamlined procurement and supply chain including preferential letters of credit for imports of essential international standard water supply equipment (pumps, etc.) not available through local manufacture, point-of-use filters, etc. • Voluntary clustering of large and small towns and MVWS schemes and introduction of internationally recognized KPIs followed by formally clustered large utilities monitored by national regulator - so as to benefit from shared resources and skills and economy of scale - for both project implementation and long term sustainable operations	S

[11] This assessment does not include potential fiduciary risks, which are the subject of a separate Fiduciary Risk Assessment being undertaken by a group of Development Partners.

Description of risk	Proposed Mitigation Measures	Rating
High level of non-functionality rate (NFR) and non-revenue water (NRW) may tend to counterbalance program outcomes	• Improvement in response time to leaks and breakdowns. • Reduction in "reactive" maintenance and increase in "planned maintenance" O&M program, including formal "asset management" (leak detection, consumer report cards, pipe surveillance, on-going replacement program, etc.) • As above, voluntary clustering of large and small towns and MVWS schemes and introduction of internationally recognized KPIs followed by formally clustered large utilities monitored by national regulator - so as to benefit from shared resources and skills and economy of scale - for both project implementation and long term sustainable operations	S
Limited or non-existent water quality monitoring and action plans	Increase in number of certified central laboratories, with aim to have one in every clustered utility (approx. zonal size) for: • water treatment, • distribution quality control, • customer feedback, • wastewater treatment, • Environmental monitoring (surface water and groundwater, industrial and domestic dispersed and point-source discharge, etc.) • Training of town and village operators	
Lack of understanding of and commitment to the Program's approach to targeting and prioritizing interventions, community involvement in technology selection based on costs and affordability	• Translation and wide dissemination of key documents such as the WIF, MOU, NWI data and this Program Document, newly developed strategies, manuals, technology options • Application of readiness criteria to ensure that conditions for successful implementation are in place before construction starts • Relevant staff will receive orientation workshops and training on OWNP targets, strategies and procedures. Closely monitor compliance with procedures and applicable standards • Improvement, formalization and training in use of rural water interactive spreadsheet tool developed for this Phase 2 document • Conduct continuous capacity building training to old and new employees and stakeholders to ensure continuity of activities	S

Description of risk	Proposed Mitigation Measures	Rating
High turnover of key staff reduces implementation capacity and achievement of goals and plans, causing delays and continuity problems	• Incentives through remuneration packages, career development structures, performance bonus, work environment, etc. • Compatibility between public and private sectors for avoid public private "drift" under rapid sector development and competition for trained and experienced human resources • Special consideration for hardship areas) for staff by adding allowances • Training additional personnel in relevant skills at TVETCs, HSCs and universities • In-service training to relevant staff in planning, procurement, implementation and monitoring, including data management • CPD (continuous professional development) for new and existing staff, monitored by professional institutes and associations • Systemized hand-over procedures from resigning staff to new staff before releasing a resigned staff to ensure continuity of established system or program. (Increase staff resignation period to allow for this) • As above, voluntary clustering of large and small towns and MVWS schemes and introduction of internationally recognized KPIs followed by formally clustered large utilities monitored by national regulator - so as to benefit from shared resources and skills and economy of scale - for both project implementation and long term sustainable operations	S
Public and/or partners' procurement rules and procedures cause serious delays in implementation	• As above, streamlined procurement and supply chain including preferential letters of credit for imports of essential international standard water supply equipment (pumps, etc.) not available through local manufacture, point-of-use filters, etc. • Close monitoring of procurement processes • Large scale packaging of contracts to make works more attractive to ICB, standardization of specification, import in bulk, cutting down unnecessary links/steps in procurement/ supply chains, etc. • Use of standard bidding and contract documents	M
Transparency and accountability (including risks associated with large scale procurement and civil works)	• Assessment of barriers and operating environment of private sector contractors and enterprises • Capacity strengthening in Public Financial Management at all levels • Physical and financial project audits by government and implementing partners • Strengthening M&E systems and procedures at all levels • Through PBS, work with the Construction Sector Transparency Initiative (COST Ethiopia), increase	M

	transparency in tendering and procurement processes through a public disclosure program	
Regional bureaus, woredas and towns face competing priorities, fail to assign adequate resources to implement Program activities and do not collaborate with all relevant stakeholders and partners	• Higher-level support will be sought from ministers, heads of regional government as well as politicians and local leaders • Monitoring by partners include assessing the situations during JTRs and MSFs, and discuss the issues at the local level during debriefing • Quarterly review of the program at woreda level and biannual review of regional activities to discuss not only achievement but also financial management, challenges and new learning and innovative ideas • Health and education sectors to include ring-fenced budgets for construction and operation of "Minimum WASH Packages" (defined in **Sub-section 4.6)** • As above, voluntary clustering of large and small towns and MVWS schemes and introduction of internationally recognized KPIs followed by formally clustered large utilities monitored by national regulator - so as to benefit from shared resources and skills and economy of scale - for both project implementation and long term sustainable operations	M
Inadequate environmental regulation and enforcement (zero or poor wastewater management, industrial wastes, SWM, septic tanks and pit latrines, building in flood plains, etc.) Short and long-term impact on water resources (quantity and quality), the adequacy and sustainability of water schemes, flooding, general environmental degradation, growing competition between water users, etc.	• Promote stronger linkages with watershed management • "In-stream" recovery practices and water conservation interventions to protect sources and catchments • Sensitize users to the importance of maintaining protected buffer zones around water sources • Introduction of urban and rural master plans that include watershed management with multi-sector coordination • Enforcement of agreed urban plans • Licensing and monitoring of wastewater discharge consents	M
Difficulty in tracking availability and utilization of GoE, DP and CSO funds may be a constraint to implementing the Joint Financing Agreement (JFA)	Prepare budget utilization quarterly financial reports showing budget availability, disbursements, expenditure and budget utilization and report to BoFEC and MoFEC	S

Lack of technology options for WASH	TA to identify: • Appropriate technology options suitable for geographic and climatic locations • Options for sustainable sanitation suitable for (a) rural and urban density, (b) water availability, (c) rocky, loamy soil, etc. and (d) hydrogeological conditions	S
Not using properly designed community mobilization methods either for their involvement in community action or behavior change program	Community awareness creation through continuous engagement and using communication and IEC materials will enhanced and secure community participation.	S
Lack of program coordination and harmonization with like partners such as CSO.	• Design and implement systematic methods and reach-out to multi-sector Ministries with like objectives as well as CSOs working in WASH to work together for the same objectives. • As above, translation and wide dissemination of key documents such as the WIF, MOU, NWI data and this Program Document, newly developed strategies, manuals, technology options • Relevant staff will receive orientation workshops and training on OWNP targets, strategies and procedures. Closely monitor compliance with procedures and applicable standards	S
Social, technical, environmental and financial Impact of; climate change, demographic shifts, rapid urbanization, industrial and agricultural development, arid area encroachment, etc.	• Water and sanitation technology mix resilient against climate change, demographic shifts, rapid urbanization, impact of industrial and agricultural development, arid area encroachment, etc. • Inclusion of refugee areas in clustered utilities along with large and small towns and MVWS schemes • Inclusion of "climate resilience" (drought and flood) in all sustainability master planning and feasibility studies for all geographical areas • Financially ring-fenced CR-WASH[12] modality (*Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia)* to reduce emergency WASH **(**WASH Cluster) and replace with sustainable development in drought/flood prone and vulnerable (inter-regional, refugee, etc.) areas Also, as above: • Promote stronger linkages with watershed management • "In-stream" recovery practices and water conservation interventions to protect sources and catchments • Sensitize users to the importance of maintaining protected buffer zones around water sources	S

[12] *This new acronym is suggested by the consultants since "CR-WASH" can be mis-understood – "climate resilience" needs to be applied to all projects*

	• Introduction of urban and rural master plans that include watershed management with multi-sector coordination • Enforcement of agreed urban plans • "Risk-informed planning" (*UNICEF*) tailored to meet the diverse needs within Ethiopia; such as dense urban development, highland areas, arid zones, refugee areas and population shifts. • Optimisation of existing infrastructure and development of city/woreda wide sanitation plans. • Licensing and monitoring of wastewater discharge consents	
Low Water Supply Tariff impact on water supply system sustainability and water utilities failure to reach full cost recovery and to be financial viable	Independent regulatory body/water board should be autonomous and empowered to fix the tariff for water supply and wastewater services with financial analyses consulting with user association	

Key: S= Significant, M=Moderate

3.7 Social and Environmental Safeguards

Environmental safeguards include environmental assessment, natural habitats, cultural property, etc. Social safeguards include aspects such as involuntary resettlements. Social and Environmental Safeguard Section/Unit within the MoWIE are facilitating effective enforcement, capacity building and monitoring of adherence to the social and environmental policies and guidelines. There is also a need to have a unit responsible for environmental and social safeguards in regions and woredas.

According to the World Bank guidelines, high risk sub projects are those that require a site specific environmental assessment (EA) or detailed environmental and social management plan (ESMP) as they may present potential adverse environmental and social risks. In many countries rigorous Environmental and Social Impact Assessments (ESIA) are carried out for all major WASH projects as a mandatory part of feasibility and/or detail design stages, while less rigorous approaches may be used for smaller urban and rural schemes.

Specifically, ESIA will be important for the "CR-WASH Program" (Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia). With respect to CR-WASH, there may be significant impact of reliable but widely spaced fixed point deep well sources on people and stock movements, socio-economic and environmental impact, etc. and deep wells may be tapping geological water where design life needs to be determined: Hence ESIA and risk assessments need to be part and parcel of CR-WASH sustainability master planning and feasibility as well as for climate resistance assessments of all WASH projects.

The **Table 3.2** below provides the extent of risks for each sub activities in a project. First steps in environmental and social safeguard assessment include the following important areas:

- It is very important to have discussion with beneficiary communities to inform the public about the upcoming project and also to get pertinent information, ideas and concerns. In targeting stakeholders, it is best t first identify the stakeholders, set date, time and place and inform them about the project and get information about their views and opinions.
- Focus group who are selected from the community is also another way of in-depth discussion to get dissenting or consenting decisions
- Public meeting is also another method and an opportunity to get more people together and discus all subprojects coming in their communities

Table 3-2: Extent of risks expected in WASH projects

Parameters	Extent of Risks		
Water Supply	No risk	Low risk	High risk
Water point rehabilitation			x
Tertiary distribution piping		X	
Hand dug wells		X	
Spring protection	x		
Surface water supply			x
Earth dam rehabilitation			x
Community reservoirs			x
Retaining walls		X	
Water harvesting facility			x
Water treatment plant			x

Hand pumps and mechanized boreholes		X	
Gravity water schemes		X	
Sanitation and waste management			
Washing facilities		X	
Public toilets/pit latrines		X	
Sewage facilities and collection			x
Soak pit and septic tanks		X	
Composting sites		X	
Waste water system and treatment plants			x

Source: ***Manual for safeguard compliance, World Bank, March 2004***

3.8 Enhancing equity through social inclusion in WASH

The Program promotes and supports social inclusion as an important strategy to enhance equity and reduce disparities in access to WASH services. Social inclusion applies to all WASH activities (including gender mainstreaming, resettlement areas, refugee areas, areas with high concentrations of ethnic minorities, pastoralists, etc.) The program also supports institutional WASH facilities that do not restrict access to handicapped or persons with disabilities.

Women already occupy important managerial roles in the health and education sectors, but less so in the water and finance sectors. A WASH gender audit undertaken by the Women's Affairs Directorate, MoWIE, provides useful knowledge and guidance as well as a baseline for assessing change during the Program.

The Program's support to the Emergency WASH Task Force (EWTI) will include promoting and supporting the reintroduction of the gender training modules prepared by MoWIE. Other gender-related aspects of the Program include, but are not limited to, planned support to women and youth-led supply chains, construction of latrines at schools for girl students and the use of gender disaggregated indicators to monitor Program results.

There are at least 30 million people, mostly in rural areas, who have no latrine of any kind. Sanitation development has multiple challenges including poverty, weak support, poor awareness and knowledge, lack of appropriate technology options and exclusion factors (affecting different categories of people such as the poor, chronically ill, HIV-AIDS, pregnant women, elderly, disabled, those in hard to reach areas etc.) It is therefore important that the approach for a universal access must be based on the principles of equity addressing three important barriers[13] which are 1) attitudinal barriers (isolation, prejudice, stigma, etc.), 2) environmental barriers (physical accessibility to infrastructure, toilet or squat hole design) and 3) Institutional barriers (policies)

WASH program should be conscious of designing and promoting appropriate technology to meet different needs of the WASH beneficiaries including provision of Menstrual Hygiene Management (MHM) and disability access; child friendly taps; urinals; conveniently located hand Washing facilities; and adequate light and ventilation in latrines.

Why focus on MHM?

MHM directly affects a good proportion of adolescent girls in school while MHM facilities are largely non-existent in schools: One impact is that, when girls stay home from school during menstruation due to inadequate facilities, it can mean that they are out of school for at least 50 learning days a year. This impacts their academic performance, future educational attainment, good paying job opportunity and economic opportunities.

[13] Sanitation and hygiene in Africa, Analysis from the Africa San conference, Kigali, Rwanda, 2014; Piers Cross and Yolande Coombs editors.

The hygiene and human right advocacy statement states "the ability to be clean and to address MHM in an appropriate way are matters of human dignity, and are included in the right to nondiscrimination, equality, bodily integrity, health, privacy …etc."[14]

[14] Global Public- Private partnership for hand washing (PPPHW) post 2015 advocacy tool kit, 2025

4. Component Description

4.1 Rural Water Supply

4.1.1 Introduction

An estimated 80% of the population in Ethiopia lives in rural areas with a high dependence on mixed and pastoral farming, often under harsh and variable climate. Many small towns provide market and rural support functions, as well as labor pools for agricultural activities. According to MoWIE annual budget year performance report 2009 EFY, 51.8 million or 68% rural population and 10.6 million or 55% of urban population had got access to improved water supplies, water non-functionality has been reduced to 11% and 61% have some form of latrine facility.

Water source development should be based on best available hydrological and hydrogeological information, interpreted by qualified professionals. The Program's rural water supply activities include studies, construction, rehabilitation and expansion of point source or small pipe schemes and multi-village schemes. Alternative water supply and energy sources should be studied at each project site to meet present and future water, fully taking into account the impact to/from other existing and proposed projects in the same surface and subsurface catchment zones.

The sustainability of the majority of rural water supply schemes has proved to be low, due to unaffordability, lack of post construction support and reliance on management through part time WASHCO members. In part, this situation calls for training and equipping WASHCOs with tools to do preventive maintenance. However, sustainable and resilient water supply service requires, increasingly, higher technology than the common spot supply from wells and gravity springs: For this, higher level, technical and permanently employed staff are needed.

The planning and implementation process for rural water supply will vary according to implementation modality (Region Managed Project, Woreda Managed Project, Community Managed Project, Non-Government Organization and Self-Supply) but in all cases it will be expected to conform with Program requirements and GoE policies regarding the Program organization, preparing annual WASH plans and budgets, reporting requirements, use of common monitoring indicators, cost-sharing policies, and technical standards, including water quality standards. (see **Table 4.1** below).

4.1.2 Implementation and Operational Modalities

Any new Implementation and Operational Modality needs to integrate with, or allow for, existing Woreda and WASHCO management and rural support structures. Point source rural water supply will remain under formal or informal WASHCOs with little or no outside assistance, except encouragement of the private sector by implementing agencies.

Table 4-1: Modality description, responsibility and funding

Modality	Description	Responsibility	Funding Source
Regional Managed program	Regions will support appraising program, conducting in depth study on ground water potentials, conducting capacity building to staff and private sectors, supervise and commission major projects, support strengthening monitoring, learning and knowledge exchange program	Regional coordination office Multi-sectoral partners	Government, DP, CWA, CSO
Woreda Managed Program	Project planning, implementation, monitoring and commissioning the project supported by the WWC, also contracting, procurement, inspection, quality and handover to the community.	Woreda WASH team Woreda WASH Consultants	Grant for capital expenditure
Community Managed Program	Communities are responsible to invest and be part of the full project cycle, from planning, implementation (including procurement of most materials and labor) and O&M on low-cost technologies. The WASHCO is directly responsible for contracting, procurement, quality control and financial accountability to the community, the Kebele and the Woreda Administration.	WASHCOs	Bilateral organizations Loans from MFI or banks
NGO Managed Program	In short NGOs are donors, implementers and knowledge disseminators; they follow the National WASH principles and practices; follow procedures of government, partner organization, foster community initiative, develop community leadership and require community investment, administer external resources on behalf of the community (as in WMPs), make external resources available to the community directly or through MFIs to support construction and management.	NGOs in association with woreda level partners	Donors MFI
Self-Supply Modality	Essentially these are private wells which are financed by beneficiaries (individual or neighborhood) and which are not adequately protected to supply clean and safe water to the households or neighbors. The problem is the site, water abstraction methods and lack of the necessary protection mechanisms such as raised apron, water tight casing etc.	Individual homes	Self
Multi-village Water Supply Schemes	See 4.1.4 below		

4.1.3 Rural water technology and operations

The systems needed to supply water to poor rural communities may be complex and costly (for instance, MVWS with deep wells and diesel generators to drive pumps). Innovative ways to introduce sustainable business models and to tap renewable energy need to be developed.

- **Rain Water:** Theoretically, about 800 ml of water can be collected from 1 square meter of surface area if it rains only 1 mm per year. Considering the surface area (harvester area) of schools and the amount of average rain fall in Ethiopia it can be said that all schools in Ethiopia should not be short of water throughout the year.
- **Sub-surface dam:** Low land areas such as Afar, Somali and Borena have many large dry river beds that are carrying large amount of flood water from the highlands. These dry river beds can be converted into an underground reservoir provided that we construct a dam structure across a convenient location along the length of the dry river beds. The water stored which is cooler and clean as a result of the natural filtration can be exploited using pumps or gravity pipes. The water stored in such manner could also recharge the underground aquifer.
- **Solar Pump:** Solar pump is also the latest technology being introduced in Ethiopia. With a minimum of 10 hours of sunshine in Ethiopia, a solar pump installed in at least shallow wells can very easily replace the hand pump which is problematic for communities as it demands careful operation and periodic preventive or actual maintenance. Solar pump could give un interrupted service or off set the deficit when no sunshine exists by storing water in an elevated storage tank

Management systems for WASHCOs to avoid time waiting for water collection should be introduced alongside increased pumping and distribution to increase per capita consumption. Improved transportation and container systems from tap to home will also benefit increased consumption and improve water safety.

Figure 4-1: Children may wait for long time to collect water

4.1.4 Multi-village Water Supply Schemes

Multi-village water supply schemes (MVWS) will be supported under certain conditions provided that feasibility studies verify that the proposed sources are adequate and that the schemes can be socially, technically and financially sustainable. MVS has been the subject of important recent discussion within GOE supported by external consultancy[15] where it has been decided to:

a) "establish independent sector regulator including performance monitoring and benchmarking of service providers"[16]
b) "formally recognize and support rural public utility management for complex large multi- village schemes"
c) "establish post-construction … capacity … capital maintenance … cross subsidy …"

[15]Rural Public Utility O&M Implementation Manual for Multi Village Water Supply Schemes
[16] The Ministry of Finance is emphasizing the need for an independent regulator … "*particularly in urban settings but increasingly in rural settings as well … (which) should include complex rural water supply scheme management*"

d) "professionalize" … "standardize" … "shift from community management to community participation", but "while other modes of implementation ... remain in place where appropriate and successful (CMP, self-supply, NGO, woreda)"
e) "clarify roles and responsibilities for rural public utility service providers … accountability to existing sector institutions"
f) "delegate functions"
g) Cluster the Rural MVS Scheme with the strong town water utility instead of establishing rural public utility management where appropriate

Discussion includes how to cover O&M costs for rural systems since "sustainable water supply is beyond the ability to pay for users" and suggestions are made regarding government or donor subsidy and "improvement of economic situation of population".

As stated by many stakeholders WASHCOs are volunteer committees and, with growing demands for quality and quantity of water supply and sanitation, it may not be realistic to continue managing the larger schemes by WASHCOs. It is believed that there is a need to devise another alternative mechanism, such as external regulatory body, to solve the O&M problems. All this would appear to be generally in line with the suggested "WASH Sector Reform Principles" listed in the table under **Sub-section 9.6**, including the longer-term concept of combining the management of MVWS schemes with clustered large and small schemes.

4.1.5 Pastoralist Rural Water

Access to improved water supply and sanitation facilities in pastoralist areas of Afar, Somali, Benishangul Gumuz and Gambella and pastoralist areas in Oromiya and SNNPR are relatively low compared to other areas and the national average. Access levels for water and sanitation in pastoralist regions and woredas ranges from 39.5% to 61%, and from 6.5% to 21% respectively, while in the other parts of the country water and sanitation coverage ranges from 62% to 95% and 41% to 76%, respectively.

The most common sources of drinking water in pastoralist areas are rivers, lakes, unprotected wells, springs, hafirs, ponds, public and privately-owned taps. Due to the scarcity of water, poor sanitation and hygiene, some of the pastoralist regions has experienced Acute Watery Diarrhea (AWD), water WASHed diseases and other hygiene related diseases.

The major problems cited for poor sanitation development by HEWs, school officials, woreda health personnel and community members are lifestyle of the pastoralists which are mobile in search of animal fodder and water, shortage of resources, lack of commitment and awareness, weak inter sectoral collaboration, uncoordinated and ineffective sanitation promotion efforts and lack of affordable construction materials for latrines.

Water supply schemes in lowland pastoralist areas should be constructed close to pasture lands and along migration routes as hydrological and hydrogeological conditions permit. Involving clan leaders like Aba Ella (the "Father of Water Wells" in Borana) in siting and technology selection can enhance the impact and sustainability of water supplies in pastoral areas.

The impact of reliable but widely spaced fixed point deep well sources on people and stock movements, socio-economic and environmental impact, etc. also needs to be addressed. For instance, additional factors have been applied to the CR-WASH[17] component (that is, using 2032 projected design population, see **Section 16**) in order to allow for anticipated population movements triggered by installation of reliable water supply.

[17] *Suggested new acronym as better than CR-WASH to describe "Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia"*

4.1.6 Refugee water supply

There are flows of refugees from the northern, southern and eastern neighbors amounting close to a million people of all ages. The policy of the Ethiopian government is not to segregate refugees but to assimilate them to society as much as possible and this has increased the demand for basic services such as clean water supply. According to UNICEF developing a "public utility-based services delivery model" will be important for efficient delivery of basic services for refugees. The model logically indicated the need for the government to own the utilities and initiate cost recovery mechanisms and mobilization of host communities. [18] Having refugees assimilated into society is very important from the view of sustainable service delivery, since the refugees, like other citizens, will be able to pay for water and sanitation services.

It is proposed to include refugee areas in clustered utilities along with large and small towns and MVWS schemes. As already stated, voluntary clustering of large and small towns and MVWS schemes and introduction of internationally recognized KPIs followed by formally clustered large utilities monitored by national regulator will benefit from shared resources and skills and economy of scale - for both project implementation and long term sustainable operations.

4.1.7 Point of use water treatment

The majority of properties in Ethiopia, both urban and rural, rely on in-property water storage of one sort or another (roof tanks, ground level tanks, open containers, etc.): Such water will be bacteriologically contaminated due to negative mains pressures, crowding around wells and stand-posts, open jerry cans, etc. and due to ineffectiveness of chemical disinfection under these conditions. This indicates the need at all service levels for "point-of-use water treatment systems" as complementary actions to ensure safety of water[19].

It is clear that source chlorination in rural areas (and probably also small towns) is largely ineffectual and has possible negative benefits: applying large and infrequent doses of chlorine will create taste problems and will not protect the water source between dosing. There is similar experience reported in relation to chlorination in emergency WASH, particularly confusion over dosage levels, products and control. Also, according to the Ethiopian Sanitation and Hygiene Improvement Program ESHIP-2, "proper water treatment at point of use and handling of drinking water at home remain difficult in practice".

The internationally agreed SDGs and the JMP "safely managed" interpretation may be onerous to a water stressed country such as Ethiopia: As such, the national and regional governments may want to consider some interim measures to address what are considered to be some critical water quality and cost issues: (a) AWD outbreaks and other water related (including "water WASH") diseases in both urban and rural areas, (b) low income households will often resort to boiling water which puts an increased strain on both the environment (depending on fuel source) and on household budgets, (c) use of treatment chemicals should probably be regarded as suitable only for emergency situations, not for regular household use, (d) others will regularly buy plastic bottles of water for drinking, which is both expensive and creates significant problems at waste disposal sites (either because of the large volume involved or because of pollution from burning) and (e) high groundwater fluoride levels in the Rift Valley result in debilitating bone necrosis.

The bacteriological impact can be tackled in all households (whether low, medium or high income) through, for instance, use of simple table top water filters using diatomaceous earth "candle" filters with activated carbon core[20]. The more turbid the water source, then the more frequently the "candles" will need to be scrubbed clean. Use of

[18] UNICEF (FN/07/2018), WASH field Note, WWW. UNICEF.ORG/WASH

[19] USAID (PSI) have pointed out that point of use treatment may conflict with "safe-at-source" strategies, but may be pragmatic at short to medium term measure.

[20] COWASH: *Power saving filters like the TULIP Dutch product with high initial investment cost and nearly zero O&M cost, should be encouraged.*

such filters, along with good sanitation and hygiene practices can have significant financial, health and environmental positive impacts.

High fluoride levels can be reduced by use of activated bone char filters or synthetic substitutes – this is already practiced in Ethiopia[21]. There is understood to be a "Fluorosis Mitigation Office" in Ethiopia and that a "Fluoride Mitigation Strategy" is being written, so this office needs to be consulted at an early stage of sustainability master planning.

Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all

JMP normative interpretation of SDG target for drinking water

Target language	Normative interpretation
By 2030, achieve	
universal	Implies all exposures and settings including households, schools, health facilities, workplaces, etc.
and ***equitable***	Implies progressive reduction and elimination of inequalities between population sub-groups
access	Implies sufficient water to meet domestic needs is reliably available close to home
to ***safe***	Safe drinking water is free from pathogens and elevated levels of toxic chemicals at all times
and ***affordable***	Payment for services does not present a barrier to access or prevent people meeting other basic human needs
drinking water	Water used for drinking, cooking, food preparation and personal hygiene
for all	Suitable for use by men, women, girls and boys of all ages including people living with disabilities

The global indicator selected by UN Member States for monitoring SDG target 6.1 is '**proportion of population using safely managed drinking water services**'[1]. Safely managed drinking water creates a new service norm and represents an additional 'rung' at the top of the JMP drinking water service ladder.

Figure 4-2: Safely managed drinking water

4.2 Rural Sanitation and Hygiene Promotion

4.2.1 Introduction

Promotion of sanitation and hygiene in Ethiopia follows a government endorsed Community Led Total Sanitation and Hygiene (CLTSH) implementation guideline.

Facilitation and community mobilization using this tool is usually carried out by woreda level trained professionals following the national implementation guideline. Community triggering should also be accompanied by persistent follow up arrangement to ensure that communities are truly acting on their action plan (designed on "triggering day"), as well as technical support when digging latrines or upgrading existing latrines. Constructing and using pit latrines in rural Ethiopia has become more common after the deployment of more than 38,000 HEWs in over 15,095 health posts at kebele level (2 HEWs/kebele) and their house to house actions.

However, although the annual rate of reduction of open defecation in the country is recognized as the fastest globally, the majority of toilets built are considered unimproved. The improved sanitation status according to the WHO and JMP updates in 2015 stands at 28% and EDHS[22] reported in 2016 to be only 6% (16 urban and 4% rural) and unimproved and shared sanitation together amount to 62% leaving 32% as open defectors.

The fourth National Health Sector Development Program target in the GTP II period is to reach to 82% with improved sanitation facilities unlike the National Hygiene and Sanitation Strategic Action Plan (NHSSAP) which has indicated a much higher target.

Lack of sustainable and improved sanitation system in urban and rural areas is exposing the Ethiopian population to preventable disease burden affecting adults and children. Among the tropical diseases, Ethiopia has the highest

[21] In Kenya Rift Valley, such units have been located on top of water kiosks and customers have the choice of raw groundwater for non-potable use and de-fluoridised (<1.5mg/l F) water for drinking and cooking.
[22] EDHS 2016, Status of sanitation conditions in Ethiopia.

burden of trachoma, ascariasis, hookworm, schistosomiasis and tricuriasis (Kebede D. et al, 2012)[23]. Helminthic and other infections exposing children to malnutrition are also well documented. Children infected with worms are 3.7 times more likely to be underweight and are typically anemic and less physically fit[24].

According to WSP (2015) study on economics of sanitation in Ethiopia, poor sanitation costs Ethiopia Birr 13.5 billion each year, equivalent to about Birr 170 per person per year or 2.1% of the national GDP.

4.2.2 Improved and Sustainable Sanitation Development during Phase II

In order for the program to be effective, a pragmatic program design and that which can strengthen the existing initiative must be used in communities throughout the country. The new initiative is to design a "Community Centered Approach" planning and action program which would train and empower permanent residents in the community. The major actors must work together for one common end at the kebele level; these actors include: community members' community leaders; sector actors (HEW, WHDA, EHW, PHCU staff); political and administrative institutions [Woreda and Kebele leaders, Woreda WASH Team members (Health, education, water, women and youth and agriculture)]; development agents; teachers and student; etc.

There were sector actors who had advocated to focus on household centered approach (Roland Schertenleib)[25] . Without undermining efforts on individual households, sustainable sanitation and hygiene programs is ensured with mass action and mass responsibility which warrants empowering the whole community and enhance community action hence "Community Centered Approach" is better than working only with individual households. An empowered, trained, and supported community will work together and practice the three key behaviors (see schematic below), **Figure 4.3.**

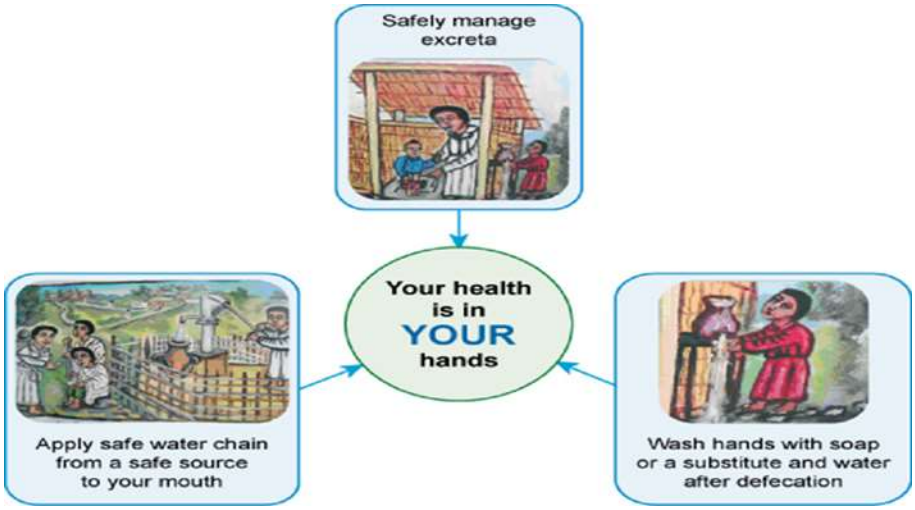


Figure 4-3: The Three Hygiene Behaviors

The Community Centered Approach is not disregarding CLTSH approach or the Health Extension program. It is an approach that is complementing, supporting and enhancing efforts and follow up of any initiative undertaken to make the change in WASH behaior and practices. Community Centered Approach is bringing the passive onlookers or the beneficiaries themselves to the center of action and make them more responsible to make their communities clean, healthy and dignified.

[23] Kebede D, Kadu M, Teshome G, et'al. 2012. The burden of neglected tropical diseases in Ethiopia, and opportunities for integrated control and elimination
[24] IRC (2007), Technical paper series 48, International water and sanitation center, Delft, the Netherlands
[25] Swiss center for development cooperation in technology and management, June 2000

Lasting or sustained behaior change in water safety, sanitation and hygiene requires for success multi sectorial approach, systematized advocacy such as multi-level advocacy and communication, strengthened household outreach, media support, increased availability and affordability of hygiene and sanitation products, etc.

With this arrangement and all the enabling environment in place the sanitation and hygiene program in communities:

1. The unimproved and unsustainable latrine will be transformed and newly constructed latrines will follow the principles and construction methods of an improved latrine system and all family members use the system constantly and make their community free from OD
2. All households with children WASH infant babies and all children under five years of age
3. All households consider child feces as harmful as adult feces and take proper action of disposing in latrines immediately after child defecates.

4.2.3 Pastoralist Sanitation and Hygiene

At present hundreds of settlements are being established in pastoralist areas. However, while seasonal movement is still practiced, women, the elderly and children remain behind in the village. This situation requires establishing schools and strengthening HEP in the settled village.

Hygiene, sanitation and water safety promotion in such pastoralist villages may have to follow a different methodology than the CLTSH approach which depends on creating disgust and fear. The pastoralist tradition is very serious on privacy during defecation. Male and female open defecation areas are located in two different opposing directions within a community making it difficult for the household to dig latrine near the house.

Hygiene, sanitation and water safety promotion should use simple and small do-able-actions first rather than jump into ideal sanitation and hygiene behaviors more applicable to fully settled communities. Small do-able actions are practices that have less demand for resources such as, for example, practicing hand Washing using ash, covering feces with soil, separating animals from human habitation, conducting sanitation campaign every week to clean up the settlement and using simple pictorial communication methods such as MIKIKIR card (used in Amhara region to help pastoralist test new behaviors and lifestyle incrementally).

The other practical approach to try is to construct a separate (male/female) shared latrine in settlement areas so that pastoralist households (old people, female and children) that are not going out with their animals will start using the latrines by way of which lifestyle changes are enhanced.

4.2.4 Sanitation Marketing

The Program will support the scaling-up of sanitation marketing as described in the National Sanitation Marketing Guideline of June 2013. It is important that sanitation marketing is conceptually and programmatically integrated and closely coordinated with related WASH activities, such as training artisans and establishing supply chains so that both water supply and sanitation services and products are promoted as an integrated package.

Training manuals and Occupational Standard (OS) for private sectors is being developed by TVET, MOH and Federal Micro and Small Enterprise Development Agency (FEMSEDA) so that sanitation marketing will be one of the business areas included in the 800 or so existing OSs: Some of these are relevant to the different sections of the training manual which are now defined as 1) sanitation and hygiene, 2) latrine technology options, 3) business management and 4) marketing and promotion. Quality control and standard for sanitation is the responsibility of Ministry of Health and TVET are responsible for establishing micro and small enterprises in one of the five major sectors (construction, mining, quarrying service, trading and manufacturing) including training design and production of latrine components. In addition, a quarterly publication on new developments in sanitation marketing is being published by Ministry of Health and distributed to stakeholders.

To this end an on-site household latrine technology option planning, design and construction manual is published and distributed for wider use. What needs to be strengthened will be to establish sanitation marketing following the four "p" principles and supported by the Micro-Finance Institutions.

4.2.5 Targeted Subsidy

It is the policy of the government that sanitation being a private matter should be financed by each individual household. The objective of sanitation development is however to prevent disease, promote health, ensure sanitary living fulfilling the cardinal objectives of the Ethiopian Federal Constitution. However, the poor, the old, and persons with disabilities who can't afford to have safe sanitation system will be obliged to defecate in the open. This practice therefore makes the community in general vulnerable to health problems emanating from poor environmental sanitation practices.

Subsidies that are targeted to the poor, old and to persons with disabilities through community selection process may be effective not only for reaching the poor and the creation of equity but also the promotion of public health and environmental safety.

4.2.6 Manuals, Guidelines and Information Materials

To date there are many resources that can be used to carry successful WASH program. In addition to the strategies, there are also guidelines developed by sector ministries and partners. Of particular relevance are the following documents issued by the Ministry of Health: Implementation Guideline for CLTSH Programming, January (2012); Sanitation marketing guideline (2013); Compendium of onsite household latrine technology options, planning, and construction manual (2018); CLTSH Facilitation Training Guide (Jan 2011), and CLTSH Verification and Certification Protocol (2012), National Monitoring and reporting system for the implementation of CLTSH, January (2012) and two important publications by WSP[26].

4.3 Urban Water Supply

4.3.1 Introduction

Ethiopia is one of the least urbanized countries in Africa, currently 20% of the population but now growing rapidly at around 5% per year, which is more than twice the growth rate for the country as a whole. See tables in **Annex 1.**

In 2008 EFY, it has been estimated that 52.5% of urban population have water supplies meeting new GTPII standards and 93% have some form of latrine facility[27]. The big achievements made in Urban WASH service delivery over the past 20 years indicate that over 10 million people have access to more convenient piped system in their home and compound and 8 million people have gained access to improved toilet facilities. [28] Analysis for the Phase II program indicates the unserved urban population to be 5.65 million (**Table 16.3** in **Section 16**).

The Program will be implemented with service levels for the following categories of towns:

[26]Scaling Up Rural Sanitation and Hygiene in Four Regions in Ethiopia through Alignment with Health Extension Program, Consensus with the Whole System and Total Engagement with Communities, October 2012, and; WSP Learning Note: Scaling Up Rural Sanitation. Learning by Doing: Working at Scale in Ethiopia, July 2011.

[27] draft GTP II Report, MoWIE, 2009EFY

[28]*WB (2017), WASH (Poverty Diagnostic Report)* IN: Development of sustainable water supply, sanitation and hygiene in drought prone areas, a Sub program document, final version, 2017

Table 4-2: Categories of towns and service levels

Category	Description
1	Towns/cities with a population more than 1 million to be provided with service level of 100 l/c/day up to the premises
2	Towns/cities with a population in the range of 100,000 to one million to have service level of 80 l/c/day up to the premises
3	Towns/cities (towns/cities population in the range of 50,000 -100,000), to have service 60 l/c/day up to the premises
4	Towns/cities (towns/cities with a population in the range of 20,000-50,000 to have 50 l/c/day up to the premises supplied with piped networks, and including multi-village water supply system under professional utility management
5	Towns/cities with a population less than 20,000 to be provided with 40 l/c/day within a distance of 250m

4.3.2 Urban implementation modalities

AS indicated in the original OWNP document developed in 2013, the Urban WASH component is implemented through two modalities: The capacity building, planning and service improvement is implemented through grant financing while finance for water supply expansion is provided on a soft loan basis. Accordingly, the process and institutional arrangements differ. At town level there are two WASH structures and processes; one for water supply and one for urban sanitation and hygiene. Both are integrated in the Consolidated Annual WASH Plan (CAP) to be approved by the City Council or Town Board.

The following **Figure 4.3** shows the organization and process for implementation of urban water supply (reproduced from OWNP document 2013):

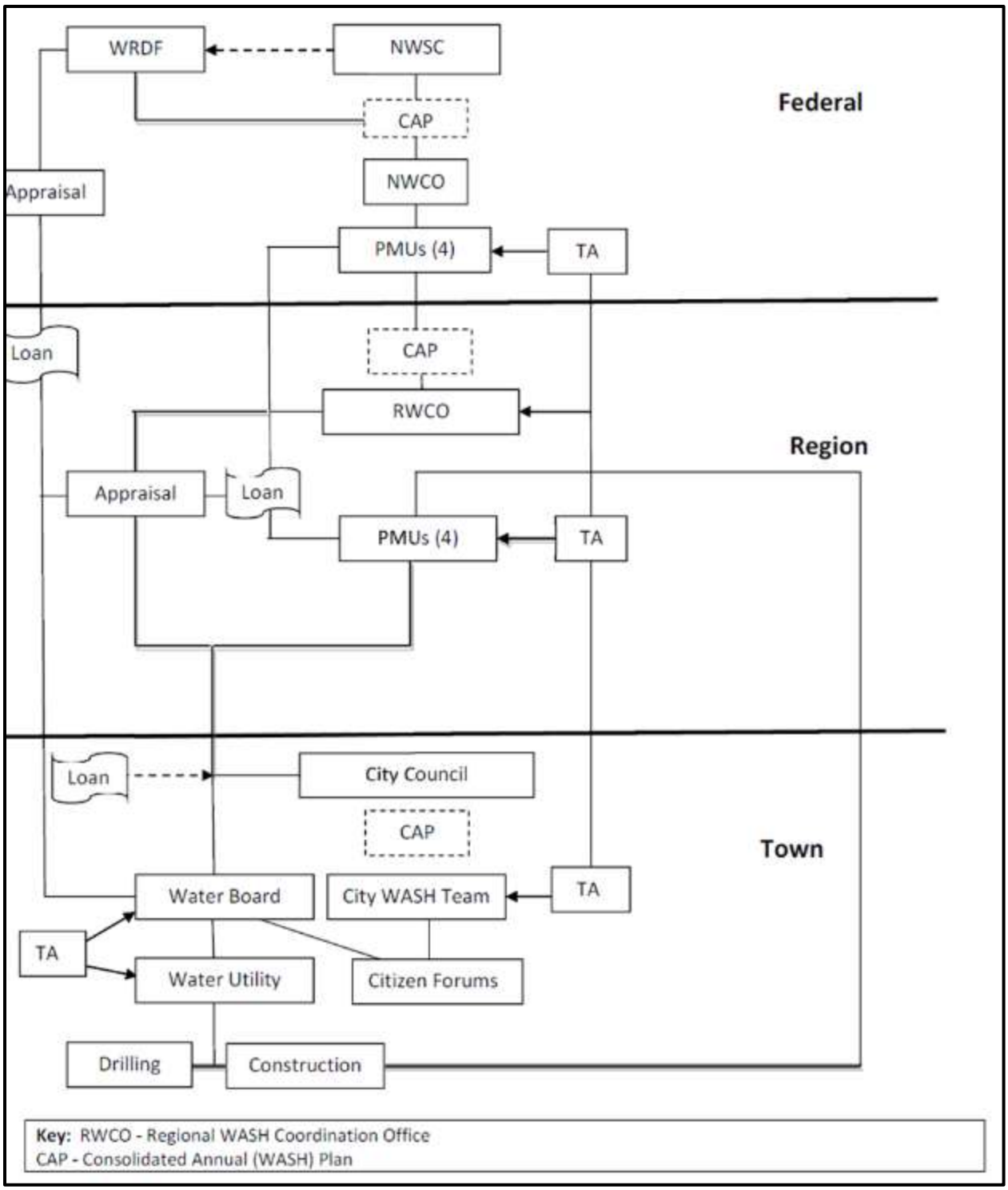


Figure 4-4: Organization and Process for Urban Water Supply

4.3.3 Improving Efficiency in Construction and Operation of Water Supply Systems

Many urban water supply projects in Ethiopia encounter significant delays in planning and implementation due to lengthy identification and selection process, procurement procedures, poor performance of contractors, cost escalation and budget overruns, among other reasons.

To address these constraints, transaction times and costs can potentially be reduced or controlled by one or more of the following means (see also Risk analysis, **Sub-section 3.6**):

1. Offering contracts in larger lots, for example for studies, borehole drilling, source development for more than one town with similar types of sources, civil works, electro-mechanical installations, wastewater treatment facilities, etc.
2. Turnkey contracts combining feasibility studies, detailed designs, business planning, construction supervision and post-construction support. Turnkey contracts combining civil works and electro-mechanical installation have already been awarded by the Water Resources Development Fund (WRDF). It is reported that the implementation period has been reduced from over two years to around one year.
3. Framework contracts with a consortium of firms/organizations to provide a suite of services to a group of towns over a longer time period also has the potential to significantly reduce transaction costs and time.
4. Service contracts between town utilities and private operators to operate completed water supply schemes can also be considered where town utilities have limited capacity to operate and maintain systems. In such arrangements, supervision/regulation of the operator is very important.

4.3.4 Construction Supervision

Construction supervision has been poor resulting in some schemes having to be redone (with commensurate high cost increase) or involving high post-construction maintenance costs, low functionality and sub-standard service delivery. Supervision of water supply works in rural areas and small towns is carried out by the regional bureaus while in medium and large town it is usually outsourced to the private sector. Supervision is not typically done through daily on-site inspections, but rather through periodic site visits.

Inspections should assess the validity of design assumptions, identify variations between actual site conditions and designs and to adjust designs according to changed parameters as needed.

The Program will promote measures to address existing shortcomings in construction supervision practices through supporting preparation of standardized supervision/inspection reports and guidelines. The capacity for adequate supervision of construction projects needs strengthening; appropriate supervision skills are essential if projects are to be completed on time, within budget and meet quality standards.

Improved supervision should help to ensure that construction is carried out according to plans, design and specifications, certify that work is progressing according to schedule and that quality and costs are monitored. Supervisors must have adequate knowledge in water supply/civil designs and construction methods, materials, manpower requirements as well as time scheduling and costing.

At woreda, zonal and town levels, construction supervision and contract management will be strengthened through the provision of professional training to supervisors and provision of manual and guidelines for supervision of medium and large water supply schemes. Training will be provided by qualified trainers from a recognized training institute and should also include the private sector; TSGs and WSGs and supervision of drilling as well as civil works, electro-mechanical instillation, pipes, pumps and other materials, manpower requirements and cost control.

4.3.5 Sustainability

Significant steps are required to improve the sustainability and safety of urban water supply and MVWS systems (see also Risk Assessment **Sub-section 3.6**):

- Source catchment protection through strict control of activities, wherever possible, ideally through watershed management plans incorporated into urban planning: The quality of water in many schemes depends upon the protection of sources from animal interference, anthropogenic activities upstream of the sources, dispersed and point source domestic and industrial liquid and solid wastes, etc.

- Current water treatment practices, monitoring and control cannot be relied upon to guarantee safe water: In the short to medium term point-of-use water treatment needs to be promoted. (See also **Sub-section 4.3.6** below on water quality)
- Clustering of urban and rural piped systems for economy and scale and sharing resources and for facilitation of future utilities regulatory bodies. This may be on voluntary basis in short to medium term and formal basis in medium to long term dependent on government strategy yet to be agreed (the principle of clustering is described IUSHS&SAP and is widely used informally in Ethiopia for sharing limited resources)

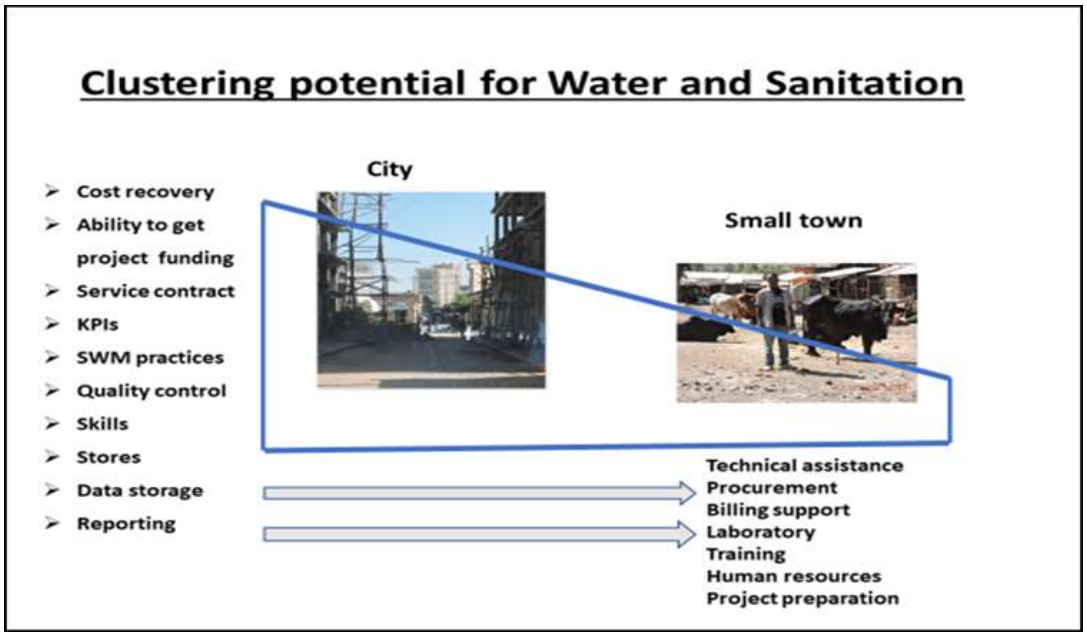


Figure 4-5: Clustering potential in WASH

Develop/update the business plans of individual or clustered utilities and develop use of performance agreements that incentivization plans to retain and motivate skilled and highly trained personnel.

- All urban systems should be electricity grid connected. Diesel generators should be installed, but only for back-up of critical system components, such as source pumping to elevated tanks. For small towns, alternative cheaper energy sources should be considered to supplement grid supply, so as to improve affordability, learning from national and regional research into alternative renewable energy technologies.
- Tariffs set at "ability to pay" levels following project socio-economic, financial and technical analyses (See **Sub-section 9.9),** and not set through regional or Woreda directives**.** Tariffs may also be influenced by willingness to pay so that the formation and involvement of Water User Groups in tariff setting is also necessary. Where tariffs do not match the costs of the desired service level, then the service levels have to be decreased (but not below 30 l/c/d) and/or subsidies have to be found.
- Water available when needed, that is, 16-hour supply for house connections, water points should be open based on demand with short waiting time (street rotas can be introduced if necessary)
- ESIA (environmental and social impact assessment) carried out at project feasibility stage so as to understand what impact the project may have in 5 or 15 years' time and to mitigate negative impacts (see also Social and Environmental Safeguards, **Sub-section 3.7**).
- It is essential that urban water supplies are matched by fecal sludge management (FSM) services, solid waste management and surface water drainage. Without these components the health impact of new or improved water supply may in fact be negative. Hence urban water funding should be conditional on sanitation to mitigate health and environmental impact (learning for instance from the experience in the 8 towns under One WASH+).

- Reduce wastage by consumers in the home, at water points, during transport, etc. Less wastage will reduce standing water.
- Quick response to mechanical breakdown and quick response to leaks (so as to reduce NRW and overall costs).
- Good design and specification are also essential to reduce NRW and to improve water quality[29]: Use of continuously welded PE100 pipes, particularly for tertiary mains, will significantly reduce both losses and the chance of contamination being drawn in as pressures drop below surrounding external water pressure
- Where pipes are push-fit jointed (DI, AC, PVC) and/or corroded (GI), then they need to be kept full and under positive internal pressure at all times in order to avoid entry of contaminated water. This means that where source plus storage cannot match peak demand, then zonal rationing will need to be applied so as to keep primary and secondary pipes full
- Delegation of operations of parts of urban systems to ring-fenced community or private operators under clear contractual obligations (and with adequate infrastructure) has been shown elsewhere to reduce NRW (physical and commercial losses) very significantly, thus increasing water availability and pressure and lessening contamination (as well as improving financial and social sustainability)
- Install computerized information system for asset and data management and bill collection systems, appropriate to the size of the utility, taking advantage of sharing (first bullet above)
- Consumers are willing to pay for a good service, which will depend upon many of the points above. "Willingness to pay", unlike "ability to pay", cannot be determined from data as a particular figure; however, experience from elsewhere is that low income customers are willing to pay a higher percentage of household income for water than middle and high-income customers. This willingness is partly due to the significant improvement from previous reliance on poor quality water provided through vendors at high cost or long distances to collect water and time and risk involved for young family members.

4.4 Water Quality

4.4.1 Introduction

Water quality monitoring program has been developed through the National Drinking Water Quality Monitoring and Surveillance Strategy introduced by Ministry of Health in 2011. However, there have not been adequate action plans supporting the strategy so as to provide a system of sampling frequencies, analysis and reporting protocol developed. Near and past researches have indicated that water is contaminated along the way from source to point of consumption. Water quality monitoring is not only useful to ascertain whether water is fit for drinking or not but also to locate the source of contamination which could be from the catchment area or leaking pipes.

The two main sectors responsible under the strategy for drinking water quality, MoH and MoWIE and their regional bureaus, have operated primarily within their own sectoral priorities and mandates. After the signing of the OWNP MoU and WIF in 2012, the roles of the two sectors were further clarified and the importance of coordination affirmed. MoWIE will test water quality of proposed surface water and groundwater sources before construction and commissioning of the schemes and will be responsible for identifying and implementing mitigation measures in areas with naturally occurring water chemistry issues such as high fluoride, iron, arsenic and salinity.

The Ministry of Health is responsible for periodic monitoring of water quality after water supply schemes are commissioned through their regional bureaus and woreda offices. Ministry of Health checks especially for bacteriological contamination using its regional laboratories and portable test kits. Currently, UNICEF, World Health Organization (WHO) and the government are distributing kits to Regional Health Bureaus.

[29] Water Safety Plans Guidelines issued in 2015 appear to miss some basic engineering and management principles that could improve water safety

It has been intended that urban water utilities level 1-3 should establish a laboratory and carry out water quality monitoring on daily bases while utilities level 4-5 and rural water supply schemes are also expected to be checked on regular bases. However, the number of water testing laboratories in each region is still very limited and need to be urgently increased in number based on logistical access. Under water sector reform, large and small utilities and MVWS management are expected to cluster and share accredited laboratory facilities and expertise.

4.4.2 Implementation

Water quality monitoring needs to be strengthened everywhere, but particularly in urban water supplies and in acute hot spots[30]. There is a need for technical and logistic support to strengthen existing public health laboratories and increase the number of laboratories in each region; partly for better coverage and partly for logistical reasons in handling bacteriological samples, etc. Remaining gaps can be bridged through the use of portable water testing kits, especially for rural areas.

The establishment water surveillance program using kits is being promoted by government and through support from UNICEF and other partners, including training and guidelines on systems of work, water quality surveillance and reporting.

4.4.3 Standards and Guidelines

The applicable standard for drinking water quality in Ethiopia is the Ethiopian Drinking Water Quality Standard: ES2601:2001 (second edition), which includes reference values for bacteriological, chemical and physical water quality parameters.

4.5 Urban Sanitation and Hygiene

4.5.1 Introduction

Urban sanitation has been re-emphasized many times since the start of the OWNP as being a key development objective (GTP II, IUSHS&SAP, WB WS&S new project proposal (PAD), etc.). Urban sanitation problem sources are from sewerage, septic tanks/ cesspits, pit latrines, domestic solid wastes, industrial and institutional and commercial liquid and solid wastes[31].

The urban population of Ethiopia is growing at slightly more than 5% per year, which is more than twice the growth rate of 2.5 for the country as a whole. (Haddis et al., 2013)[32]. Ethiopia's urban population has doubled and is predicted to triple from 15.2 million in 2012 to 42 million by 2037 indicating for more efforts for urban WASH program. See also estimates made as part of this Phase 2 program, **Annex 1.**

It is estimated that by 2020, the volume of wastewater generated from Addis Ababa alone, much of which enters the AWASH and Akaki Rivers, will exceed 200,000 m^3/day or 73 M m^3/year, of which an estimated 10% is industrial wastewater[33]. At present there are no national standards for industrial and domestic wastewater. Developing such guidelines and associated directives and regulation as a collaborative effort between the Environmental Protection Authority (EPA) and MoWIE is an urgent priority.

[30]Hot spots include areas where the risk of contamination of drinking water and related disease transmission are high.

[31]SDG6.3**:** By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

[32] Haddis, A., Getahun, T., Mengistie, E., Jemal, A., Smets, I. and Van der Bruggen, B. (2013) 'Challenges to surface water quality in mid-sized African cities: conclusions from Awetu‐Kito Rivers in Jimma, south‐west Ethiopia', *Water and Environment Journal*, vol. 28, no.

[33]Urban sanitation and wastewater treatment in Addis Ababa, Ethiopia, D. Van Rooijen and G. Taddesse, Addis Ababa, 2009.

The Integrated Urban Sanitation and Hygiene Strategy and Action Plan (IUSHS&SAP) has been introduced to address the increasingly critical urban sanitation situation. Similarly, the Hygiene and Environmental Health Strategy (HEHS) is a high impact intervention that addresses WASH as one of the most important causes of morbidity and mortality.

4.5.2 Responsibility and mandates

The responsibility lies with many stakeholders in government, community, and private stakeholders which are outside the direct influence or control of the four key ministries which are current signatories to the WIF[34]. It is therefore necessary to establish holistic coordination mechanism with the relevant stakeholders.

Inclusion of sanitation should be ensured at local level: With some exceptions, all urban WASH projects proposed for funding should include sanitation as a pre-condition for finance. In addition, "sustainability master plans and feasibility studies" must clearly demonstrate how the operational and financing costs of the chosen levels of technology can and will be funded; through direct charges/tariffs, cross subsidy to sanitation from water sales, municipal rates, central government grants, etc.

4.5.3 Technology options

When considering GTPII targets for sewerage (6 cities where at least 100 l/c/d would be required to flush sewers to off-site treatment) then this would increase urban water investment very much more. Comparative analyses of the available wastewater treatment technologies carried out locally and internationally reveal that centralized systems like conventional activated sludge system and equivalent technologies could be relevant for 80,000-100,000 pe range provided there is enough space, that sufficient water can be guaranteed for full flush toilets and that there is a possibility of reuse of the treated effluent in a cost-effective manner.

In order to have adequate water available to flush long sewers, the current urban water supply service levels of around 30 l/p/d needs to be increased to all-year-round (including drought years) reliable supplies of at least 100 l/p/d and 150% of industrial and commercial demand (to allow for NRW loss). There may be economy of scale advantages to link adjacent cities and towns in terms of infrastructure development and reuse of treated effluent.[35]

However, the IUSHS&SAP recommends decentralized wastewater treatment and this appears to be the direction taken under the new WB[36] Ethiopia Second WS&S project PAD March 2017 proposals; except for Addis Ababa where sewerage will be expanded. DEWWATs allow for minimal pour flush using waste water so can be used with current urban water supply availability (less than 30 l/c/d[37]).

It is common for septic "holding" tanks in urban areas to (illegally) be made leaky, even where soil soak away capacity is limited or where there is insufficient land for safe liquid effluent treatment. This is understood to be to avoid the high cost and/or unavailability of vacuum trucks. Planning for new schemes should involve ground vulnerability maps to determine which areas are suitable for septic tank and soak away and which areas should stay as dry toilets (VIP latrines) until off-site sewerage (or alternative DEWWATs) is available.

For a full description or urban sanitation implementation and O&M, refer to the IUSHS&SAP.

[34] GTPII Goal 4.5: Strengthen WaSH integration to meet the objectives of OWNP and establish coordination with MoUDC and its affiliates at all levels in urban WaSH intervention

[35] Addis Ababa, Kaliti and Akaki towns that share the same catchment area could be good examples where the treated effluent of the Addis Ababa centralized waste water treatment could be used for irrigation around Kaliti and Akaki. Furthermore, buildings and institutions located upstream of the treatment plant especially in Kaliti could also be connected to the system.

[36] As stated by WB, the huge budget needed for urban sanitation is not allocated in the Consolidated WASH Account

[37] COWASH: *With the current consumption of 30l/c/d, implementing GTPII will be a challenge*

4.6 Institutional WASH

4.6.1 Introduction

Institutional WASH covers schools, health facilities, public offices, prisons, etc. It falls within both rural and urban as depicted in the schematic, **Figure 4.6** below:

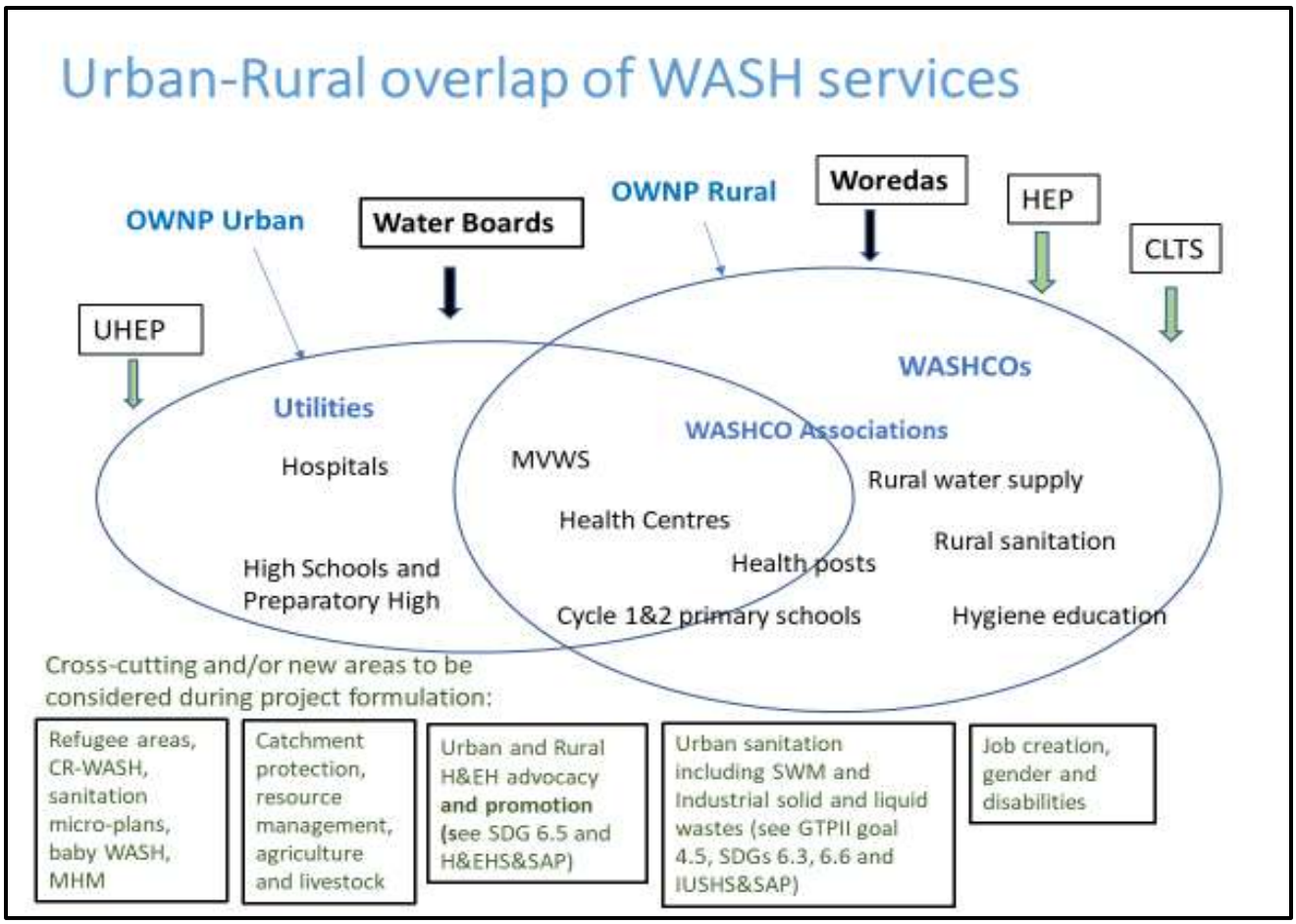


Figure 4-6: Urban/rural overlap

4.6.2 School WASH

WHO defines a healthy school as one that constantly strengthens its capacity as a healthy setting for living, learning, and working[38]. A healthy school environment is one that protects students and staff against immediate injury or disease and promotes prevention activities and attitudes against known risk factors that might lead to future diseases or disability.[39]

In Ethiopia, schools often have inadequate water and sanitation facilities; in 2015:

- 11% of primary schools had appropriate water facilities and 3.2% had all WASH facilities
- 24% of secondary schools had appropriate water facilities and 10% had all WASH facilities

The provision of safe water and sanitation facilities combined with hygiene education contributes to improving school enrolment and attendance and can potentially lower the drop-out rate, especially of girls. Educating girls is the single most effective tool for raising economic productivity, girls who are denied education are not only more vulnerable

[38] WHO. Healthy Nutrition: An Essential Element of a Health-promoting School, Information Series on School Health. WHO, 1998.
[39] American Academy of Paediatrics. Committee on School Health, School Health Policy and Practice, Fifth Edition, 1993.

to poverty, hunger, violence, abuse and exploitation, but they are also more likely to die in childbirth and are at greater risk of diseases.

The School WASH Strategy and Guidelines aid efforts to address institutional WASH problems.

To address the problem of inadequate water supply and sanitation in schools, MoE has developed the following working documents:

- Developing a School WASH Strategy and Action Plan
- Developing guidelines for water and sanitation needs of school children
- Develop gender and age sensitive curriculum on sanitation and hygiene
- Establish standards for construction of school latrines and hand washing facilities
- Upgrade life skills of school children and teachers on sanitation and hygiene education
- Establish health/environmental/school WASH clubs and promote children as agents of change

Minimum Packages for School WASH

The Minimum WASH Packages for schools is depicted in the following **Table 4.3** and should be provided entirely by health sector budgets (both CAPEX and OPEX). In general, the role of health and education under the OWNP will then be primarily one of promotion of WASH practices and advocacy for provision of Minimum WASH Packages in all schools.

Table 4-3: Minimum WASH packages for schools

Parameters	Standard
Minimum package	Full package of WASH services (latrine, hand washing, MHM facilities, urinals, drinking water fountains/taps)
Placement	• Latrine for male and female students must be separated and placed in opposite directions • Latrine to student ration should be one latrine stance for 50 girls and one for 75 boys
Facility features	• Latrines should provide adequate and separate access (male/female) to persons with disabilities both in accessing the latrine (ramp) and support mechanisms (hand rail) for sitting or standing • Each latrine block should have hand washing facility with soap or ash as cleaning agent • Separate room for Menstrual Hygiene Management (washing, changing, and waste disposal) • Adequate and safe water supply should be available in schools. There should be a drinking fountain or tap; at least one tap for 50 students
Latrine stance ratios	• one stance/cubicle per 50 girls and one toilet for female staffs in rural schools • one stand/cubicle and one urinal per 75 boys and one toilet for male staffs in rural schools • In urban schools the number of seat to student ratio should be one stance for every 25 girls and one toilet for female staffs and one stance plus one urinal for every 50 boys and one toilet for male staffs • At least one toilet cubicle each should be accessible for staff, boys and girls with disabilities; this includes level or ramped access, wide door and sufficient space inside for a wheelchair user or helper to maneuver, and the provision of support structures such as a handrail and toilet seat.[40]

[40] Federal MoE, (October 2017), National School Water, Sanitation and Hygiene Implementation Guideline

Other Requirements

- School WASH forums at regional and Woreda level should be formed in order to reduce the lack of awareness on OWNP from federal to lower level, and for knowledge exchange, experience sharing and learning.
- Having the facilities is not enough but the operation and management aspects of WASH facilities especially in cleaning the sanitation, hygiene and water facilities must be strengthened.
- One "new" initiative recommended to schools is the use of vacuum truck to pump out sludge from the school latrine. Construction of safe and cleanable latrine with secured doors and solid walls for privacy costs a lot of money. Instead of abandoning such latrines and dig a new one each time it is filled, pumping out the sludge and renewing the pit is cost effective.

4.6.3. Manuals, Guidelines and Information Materials

The design and construction manual for water supply and sanitary facilities in primary schools[41] and the production of a package of multi-media materials designed to promote sanitation and hygiene in schools has been produced by the Ministry of Education with support from UNICEF.

Currently, health and education WASH capital works and operational costs are poorly funded through regular sector budgets (since WASH is not ring-fenced) and are (inadequately) "temporarily" financed through the CWA. As stated above, this system should be changed within the short term (to 2020) to ensure that that all in-premises institutional WASH facilities are built and operated through regular ministry budgets (whatever the source of funds; GOE, loans, grants, CSO, private, etc.) OWNP (including CWA) funding should be confined to services to the boundary of institutional premises (including prisons, churches, government offices, education and health).

MoE is understood to be currently drafting an institutional framework for school WASH for effective and efficient implementation of the OWNP. Integral to this strategy should be central (ministry) budget ring-fenced funding for all "in-premises" capital, operational and maintenance/replacement WASH costs. It has been proposed to leverage additional finance for Institutional WASH interventions by integrating with Health Care Financing Initiative (CASH) and mobilizing resources from communities and private investors.

The school WASH program demands more attention because the facilities and proper practices are considered to be a major life skill learning to children. Children practicing good hygiene behavior in schools may also transfer the behavior to the family members. It is therefore a way of changing the generation for good.

4.6.4 WASH in Health Facilities

Lack of improved drinking water, sanitation and hygiene facilities in health centers, health posts, clinics and public hospitals are of particular concern. Absence or inadequate hand washing before and after patient contact or after using the toilet leads to preventable infections in the health care environment[42].

In Ethiopia there are 15,095 health posts, 2,660 health centers, 122 public hospitals and 4,000 private for-profit and not-for-profit clinics. The water, hygiene and sanitation situation in the health facilities is poor, it is estimated that as many as 80% of the health facilities are without adequate water and sanitation facilities and 97% are without hand washing facilities. The Program will support construction or rehabilitation of water supply facilities and latrines at health centers and health posts. MoH, through regional/city bureaus and woreda and town health offices, will be responsible for WASH construction activities in health facilities. Implementation may be through WMP or CMP.

Table 4-4: Minimum WASH service requirement in health care facilities

[41] Design and Construction Manual for Water Supply and Sanitary Facilities in Primary Schools, MoE, MoWIE, UNICEF, 2012.

[42] Rehfuess EQ. Bruce N.Bartram JK (2009). More health for your buck: health sector functions to secure environmental health. Bulletin of the World Health Organization, 87: 880-882(http:/www.wh.in/bulleting/volumes/87/11/08-059865/en/index.html, accessed 12 January 2012).

Health Institution	Minimum Packages		
	Water	**Sanitation**	**Hygiene**
Hospital and Health Center	Running water in • inpatient room, • outpatient examination room, • Shower facility for delivery room	• Toilet access for inpatients • Toilet facility with hand Washing for outpatient	• Hand Washing facility chemicals with soap or other disinfectant in all rooms
Health Posts	• Running water in delivery room and examination room	• Male/female separated VIP or improved latrine	• Hand Washing facility with soap in the compound • Hand washing facility with soap in delivery and examination room.

4.7: Climate resilient and emergency WASH services

4.7.1. Emergency preparedness, response and recovery WASH

The most common emergencies are drought, flood, rapid population shifts, etc. During emergency people in the affected areas may have to move to a different location considered to be safer for them. In this instance the most affected are children, women, and the elderly. The most important needs of water, food, shelter, sanitation and medical services are difficult to have in place unless prior preparedness is made.

The recent social challenges facing Ethiopia is the close to a million refugees that are camped in the north, south-west and Eastern part of the country. From public health point of view such mass influx may be a concern with respect to the transmission of communicable disease, environmental contamination and resource depletion through sharing. Although UNCHR is primarily responsible for refugees there must be a mutual plan to create conditions for both refugees and the host country.

As stated in **Sub-section 4.1.6** above, having refugees assimilated into society is very important from the view of sustainable service delivery, since the refugees, like other citizens, will be able to pay for water and sanitation services. It is proposed to include refugee areas in clustered utilities along with large and small towns and MVWS schemes.

According to UNICEF/UNHCR, preparedness for WASH emergencies includes; planning for emergency staff deployment, pre-positioning of strategic supplies, preparation of pre-approved contracts with local implementation partners (such as water trucking companies) and suppliers, advance coordination arrangements with government partners and other stakeholders, manuals for chlorination, storage and distribution of safe water, construction of safe latrine, hand Washing station, shower services, operation and management arrangements and solid waste collection and disposal facilities.

[43]Under OWNP Phase 2, further development of Emergency, Preparedness, Response and Recovery (EPRR) procedures will be done. It is proposed that the Emergency Preparedness and Response Unit (EPRU) in MoWIE be considered as a member of the NWTT or the CR-WASH[44] (CR-WASH) Team and provide information on plans, progress

[43] This paragraph to be checked by NWCO/UNICEF
[44] See 4.7.2 below

and expenditure to the NWCO. However, WASH Cluster management and budgeting will remain outside of NWCO direct oversight.

4.7.2. Development of Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia (CR-WASH[45], previously termed "CR-WASH")

- Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia which aimed to reduce emergency WASH (WASH Cluster) and replace with sustainable development in drought/flood prone and vulnerable (inter-regional, refugee, etc.) areas is a new OWNP component which has objectives focusing on health and well-being of drought affected rural and urban areas and will receive prominence and focus during Phase 2. Phased replacement of Emergency WASH with CR-WASH is planned wherever possible. Emergency WASH will be reserved for unpredictable occurrences, not regular drought cycles.

Although the whole OWNP overall objectives is to enhance the well-being and productivity of the Ethiopian people through the provision of adequate, reliable and clean water supply and sanitation services, there are areas where an accelerated WASH program with sustainable and "high tech" solutions becomes an urgent economic, humanitarian (as well as political) imperative. Such areas have increasingly high climate variability, located predominantly in arid or semi-arid parts of Afar, Somali, Oromiya and some areas in SNNPR. Currently, reliable, safe and climate resilient water access is not well developed in these areas resulting in the need for regular and high cost emergency response.

Looking at the population increase, climate variability and risks associated with the cyclical drought problem in Ethiopia the arid and semi-arid areas of Ethiopia require a multi-faceted sub program under the One WASH National Program to provide sustainable WASH services to the dominantly pastoral and agro-pastoral communities, including livestock watering. This involves ground water and surface water development and construction of multi village schemes for cluster of communities employing cutting edge technologies and developing systems for monitoring, post construction support, capacity building and enhancement of the participation of the private sectors.

Deep well drilling to tap reliable and good quality water reserves and long distribution pipelines are envisaged. Increasingly, abundantly solar energy in these areas will be harnessed to improve operational financial sustainability.

Capital works described in **Section 16** identifies a proportion of WASH budgets that may be appropriately allocated as CR-WASH (the term CR-WASH may appear in some tables, etc.). CR-WASH will be integrated with water conservation and catchment management to ensure sustainability, additionally, proposed post-construction support units and capacity building using regional universities and TVETCs[46] will assist the CR-WASH program as well as regular projects.

[45] Suggested new acronym as more accurate than "CR-WASH" to be approved or alternative to be proposed by NWCO, to avoid confusion

[46] FDRE (2017) Development of sustainable water supply, sanitation and hygiene program in draught prone areas of Ethiopia, sub-program document, unpublished

5. Readiness Criteria and Targeting for Equity

5.1 Readiness Criteria

To ensure that there is an enabling environment that will promote effective and efficient implementation and support the sustainability of constructed facilities; "readiness" criteria were proposed in Phase 1 for all levels. The readiness criteria are intended to be fulfilled before disbursement of funds for procurement of works and physical implementation takes place. Readiness criteria which should ideally be in place in each planning cycle are listed in the **Table 5.1** below**:**

Table 5-1: Readiness Criteria

Federal level	**Regional Level**
• Fiduciary risk assessments • Appraisals concluded with positive results • Budget availability for Phase II approved by MoFEC and partners • NWI data accessible to all relevant parties • M&E staff and procedures with agreed monitoring indicators in place	• Capacity building unit is established and is functioning • Verification workshop held • Consolidated Annual WASH Plan and budget prepared • Budget for WASH activities approved, including Emergency WASH activities in some regions • Zonal WASH offices/command posts established where required in larger regions • M&E staff and procedures with agreed monitoring indicators in place • NWI data accessible to all relevant parties
Zonal Level	**Woreda Level**
• Zonal WASH organization/command post established • Annual WASH budget confirmed with separate budget line for sanitation and hygiene • Consolidated Annual One-WASH plan approved • M&E staff and procedures with agreed monitoring indicators in place • NWI data accessible to all relevant parties	• Agreement on contributions of parties to the Program, including a consolidated annual plan and budget signed between partners and woreda government • Woreda WASH plans prepared and approved by the woreda council • M&E staff and procedures with agreed monitoring indicators in place • NWI data accessible to all relevant parties
• Towns/Cities Level	• Community level
• Consolidated Annual WASH Plan prepared and approved • One WASH organizations established, staffed and operational • Separate budget line for sanitation and hygiene included in annual budget • M&E staff and procedures with agreed monitoring indicators in place • NWI baseline data available and accessible to all relevant parties	• WASHCO formally recognized and registered at kebele or woreda level with gender-balanced membership • WASHCO elects' officers • One WASH annual plan approved by community and WASHCO members • WASHCO opens a bank account for community contributions for O&M • Contributions from users collected and deposited in the WASHCO's bank account •
Kebele Level	
• Consolidated WASH plan and budget approval by Kebele Chairman and Council	

5.2 Targeting for Equity

As described in the OWNP document 2013, the Program seeks to reduce regional and social disparities in access to safe drinking water and improved sanitation requiring; identification and targeting areas with low access to safe water or improved sanitation, using disaggregated indicators to track gender equity in roles and benefits, identification of acute water and sanitation "hot spots".

Success in creating equity targets requires close coordination between the Program and various humanitarian organizations providing emergency WASH interventions. As indicated above, to this end, it is proposed that the Emergency Preparedness and Response Unit (EPRU) in MoWIE be considered as a member of the NWTT or the CR-WASH (CR-WASH) Team and provide information on plans, progress and expenditure to the NWCO.

For WASH interventions in hot spots, regional and woreda readiness criteria will still apply. However, at community level, eligibility requirements will not require that the WASHCO be established as a legal entity or that an annual consolidated WASH plan be approved before receiving assistance. However, the WASHCO will still have to formally convene, elect members be trained, and prepare their bye-laws.

Standards of WASH services in urban poor settlements, citizens' participation in monitoring the standards of WASH service and weak local governance are issues affecting urban communities across the country. Awareness of the low level of equity to urban WASH needs to be improved through advocacy at all levels (**Sub-section10.8**).

Achieving access to WASH for the poorest and most marginalized groups such as people living in informal settlements needs; (1) improved information on community WASH facility services in slums (particularly for people with disabilities, children and the elderly), (2) designing and testing technologies that address the needs of poor and marginalized people and (3) prioritization of the poorest people in WASH programs.

Refugees

The recent social challenges facing several of Ethiopia's neighbouring countries has resulted in close to a million refugees that are camped primarily in the northern, western, and eastern parts of the country. Deteriorating health surveillance conditions in some of these refugee and asylum producing countries presents a risk of transmission of cross-border communicable diseases in addition to resource depletion through sharing. The Administration for Refugee and Returnee Affairs is responsible for planning for water and sanitation for refugee populations. The administration does not typically have WASH technical staff in all of the areas of operation.

Modalities for integrated service provision for water supply and the full chain of liquid and solid waste management through utilities are being initiated to increase the technical capacity of utilities servicing refugee populations through involvement of regional, water, and town water offices. By planning demand of host community utilities to include refugee demand, resources required for costly water trucking activities can be more efficiently used for more resilient and durable schemes where refugees cannot return to their countries of origin for a protracted period of time.

6. Program Organization and Partnerships

6.1 Program Organization

As described in the OWNP document 2013, the highest governing body in the Program is the National WASH Steering Committee (NWSC) whose members include Ministers and State Ministers from the ministries of Water, Irrigation and Energy, Health, Education and Finance and Economic Development. The NWSC is chaired by the Minister of Water, Irrigation and Electricity.

The technical arm of the NWSC is the National WASH Technical Team (NWTT) consisting of Directors from the four WASH ministries. A similar structure is prescribed at regional level. The lowest level of WASH governance is the woreda. At woreda level WASH activities are implemented by the (District) Woreda WASH Team (WWT) led by the Woreda (District) Administrator. Its members are from the four WASH sector offices (Water, Health, Education, and Finance, with additional members from the Women Affairs and Agriculture offices). Development partners are presently represented by the Development Assistance Group – Water Technical Working Group.

The National WASH Coordination Office (NWCO) is responsible for coordinating, planning and oversight of Program implementation at federal level and at regional level (through RWCOs) and to stimulate and attract partners to join the OWNP in the planning, implementation and reporting processes. The NWCO reports to the NWSC supported by the NWTT. Implementation of the Program in the sector ministries is the responsibility of WASH Program Management Units (PMUs) in the ministries of Water and Energy, Health, Education and Finance and Economic Development, respectively.

At regional, zonal and city levels, planning and implementation of the Program is intended to be coordinated by Regional WASH Coordination Offices which report to a Regional WASH Steering Committees and to the National Coordination Office supported by a regional WASH Technical Team. Implementation is intended to be managed by WASH PMUs in the bureaus of water resources, health, education and finance and economic cooperation. Currently, RWCOs are tasked with management of the CWA activities but duties are expected to expand to cover all OWNP activities, that is, oversight and reporting of all GOE, DP and CSO financed projects, including education and health sector budgets.

The same process is replicated at the zonal, (zonal coordination office) woreda (Woreda WASH Team consisting of water, health, education, finance, women and woreda administration), kebele (kebele chairman/administrator).and at community level by the WASHCOMs.

Figure 6.1 below shows the institutional arrangements and functions for implementing the Program through the CWA.

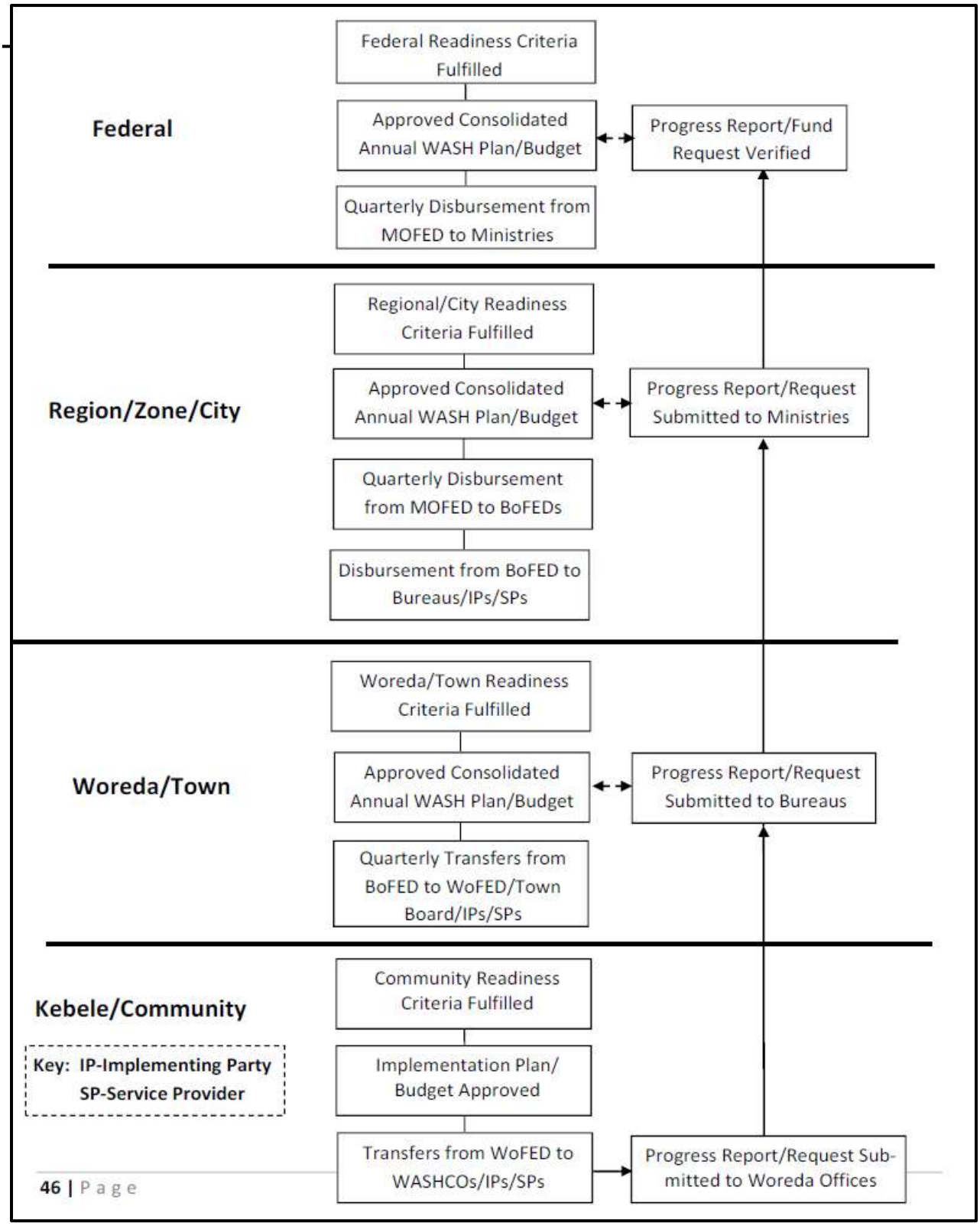


Figure 6-1: Program Implementation Process

6.2 Partnership arrangements

During Phase 2, increasing effort will be made to encourage Program implementation as a joint effort between Government, Development Partners, CSOs, training institutions, the private sector, community members and other stakeholders through contributions to the Consolidated WASH Account (CWA) at federal level. However, partners, including bilateral aid organizations and CSOs, are expected to continue to support the Program through other funding arrangements, as well as through the provision of technical assistance, supplies, etc.

The important partners for OWNP are not only financial contributors but also others who can support in various ways other than finance. As described in the OWNP document 2013, the WASH Implementation Framework (WIF) the Program has three types of partnership arrangements:

1. **Partners -** organizations contributing to the Consolidated WASH Account (CWA) at federal level. In this category are international, bilateral and finance organizations who have together with government established the consolidated WASH account.
2. **Associated Partners** – organizations funding construction of water supply and sanitation facilities, technical assistance, supplies and other support to OWNP, but not using the CWA. These include some IFIs but predominantly CSOs which plan and budget WASH services in direct collaboration at federal, regional and woredas levels. There is a need to map these partners and fully document their activities, outputs and contributions as a clear part of the OWNP.
3. **Collaborating Partners** – organizations providing other types of assistance to OWNP, i.e. training, studies, manuals, communication products, participation in the Multi-Stakeholder Forum, etc. These categories could be the international, bilateral and financial organization who are also supporting OWNP in hiring consultants to augment staff shortage and provide expert service, support organizing forums, workshops, training and preparing and printing manuals and guidelines.

There is currently poor understanding that OWNP encompasses the whole WASH sector activities not just the contribution from the CWA. A two-pronged advocacy approach is required; (1) general awareness regarding the OWNP and (2) attracting new partners to the CWA

This may involve, for instance:

- Introducing the program scope through written or mass media
- Inviting would-be partners to forums, meeting and workshops to make them part of the discussion and let them see how aligned their program is with the WASH program and see whether they can benefit by joining the CWA
- Sending out quarterly, biannual or annual activity and financial reports to wider audiences including media, financing organizations, teaching and research organizations, etc.

There is clear evidence that the OWNP will soon need to be expanded to include inter-relationship with stakeholders outside of the original four OWNP signatory ministries:

- Ministry of Urban Development and Construction (MoUDC) which can be engaged or partner in utility operations, sanitation services, reuse of treated sanitation solid and liquid wastes, protection of water resources (point source and dispersed pollution, industrial liquid and solid wastes, domestic solid wastes), strict control of urban plans (including watershed protection zones), etc.
- Ministry of Agriculture and Natural Resources (MoANR) which oversees major water users and also promotes afforestation program with direct relationship with water conservation and water resource management

- Ministry of Environment, Forest and Climate Change (MoEFC) which is interested, mandated and focused on water pollution control through its existing regulatory procedures (and in future through an Environmental Protection Agency (EPA)), and involving overlaps with MoUDC activities listed above - protection of water resources (point source and dispersed pollution, industrial liquid and solid wastes, domestic solid wastes), strict control of urban plans (including watershed protection zones), etc.
- Private sector, which could include those working in water drilling, water and waste water construction, FSM businesses, and other contractors related to water and sanitation aspects. In addition, activities by private companies (particularly major water users and/or those involved in solid and liquid waste accumulation) may make a significant positive contribution through (1) advocating "win-win" compliance with environment regulation (both "carrot" – raising company profile to shareholders and host town/woreda/region - and "stick" approaches – EPA enforcement) and (2) Corporate Social Responsibility (CSR) activities, such as under the UN Water Stewardship Program. See also **Sub-section 10.5.8** below.
- Educational institutions which could support in capacity building, design, research and learning program in WASH, hence enhancing knowledge that can be shared with WASH signatories and would-be partners.

For CR-WASH, it may be necessary to design a coordination mechanism to work together with the broader non-MOU signatory stakeholders which include new and relevant ministries.

However, working with new partners demands horizontal engagement, coordination and collaborative action which can be solidified by designing some kind of agreement. It can be an MOU or a coordination agreement on general or specific programs. Establishing a well-structured forum with well-designed objectives is also another way of enhancing good working relationships.

6.3 Minimum Staffing Package

In order to effectively implement the OWNP Phase II (table 6) below indicates the minimum staffing package is proposed at various levels. Focal persons are not full-time staff but will perform their Program-related tasks alongside other duties.

Table 6-1: HR Requirement

Level	Level
Federal Level 1. National WASH Coordinator (1) • Study design and construction team • Procurement and contract administration • CD and private sector support team • Resource mobilization team • M&E Reporting and documentation team 2. WASH Coordinator (1) 3. PMU coordinator (one for each of the four ministries) 4. M&E staff (1 M&E specialist and 1 data entry clerk) 5. Procurement and contract management (2 staff so that they can share the regions into two)	**Regions** 1. Regional WASH Coordinator 2. M&E focal person (1) 3. Procurement and contract management focal person (1) 4. Financial management/accounting focal person (1) 5. WASH focal person (1 for each of the four bureaus) 6. Community management expert (1) 7. Water supply engineer (1) 8. Environmental Health /S&H Specialist (1) 9. Capacity Building expert (1) 10. PMU (one for each of the four ministries 11. Gender Specialist (1)

6. Financial management/accounting (4 staff) 7. Community management expert (2 staff) 8. Water supply engineer (2 staff) 9. Environmental Health/S&H expert (2 staff) 10. Capacity building experts (2 11. Gender Specialist (1) 12.Disability Specialist (1)	12. Disability Specialist (1)
Zones 1. WASH Coordinator (1) 2. M&E focal person (1) 3. Procurement and contract management focal person (1) 4. Financial management/accounting focal person (1) 5. Community management focal person (1) 6. Environmental Health/Sanitation and Hygiene expert (1)	**Towns with greater than 50,000 population**[47] WASH focal person (1) 1. M&E focal person (1) 2. Procurement and contract management focal person (1) 3. Financial management/accounting focal person (1) 4. Woreda WASH Consultant team 5. Customer relations focal person (1) 6. Water supply engineer (1) 7. Environmental Health/S&H Specialist (1)
Woredas 1. Water quality expert (1) 2. Hydro geologist (1) 3. Environmental health workers (2) 4. Social workers (2) 5. Community facilitation team (2) 6. Gender specialist (1) **7.** Social and safeguard expert (1)	

[47] Towns with a population of less than 50,000 can get support from larger towns or zones.

7. One WASH National Program Phase II Strategy

7.1 Introduction

The government WASH program evolved from a single water program to water and sanitation program and now to water, sanitation and hygiene program. The One WASH National Program has the potential to scale up WASH intervention to the whole of Ethiopia through fast-tracking activities in water, sanitation and hygiene, in a multi-sector environment, to a point where all people have sustainable, safe, and affordable access to water and sanitation services, make effective use of these services and adopt improved hygiene practices.

A strategy action plan for WASH is required to provide a roadmap for accomplishing the specified goals and to provide clear communication to stakeholders such as financiers, partners and staff engaged in the change process. Strategic planning is based on identified gaps or challenges, deals with the challenges and plans where we want to be.

The strategy "vision" is to see that all people in rural, urban and institutions are supplied with sustainable, climate resilient, safe and clean water and sanitation services. As for Phase 1, its "mission" is to mobilize adequate resources through engaging multiple partners and donors and use the human and financial resources efficiently for a lasting change in water and sanitation program in Ethiopia.

Addressing the shortfalls in adequate and safe water, proper human waste disposal and liquid waste management are the focus areas for the OWNP strategy. The GTP 2 Goal is to provide clean and safe water to at least 85% of the rural population and 75% of the urban population and at least 82% with improved sanitation.

7.2 Current state of WASH in Ethiopia

In 2015 Ethiopia met its MDG for water supply. This significant achievement was largely driven by the very rapid increase in safe water access in rural areas where an estimated 57 million people got access to piped and protected water sources between 1994 and 2015. In urban areas an additional 10 million people benefited from gaining access to piped water in their premises.

According to a World Bank Diagnostic study on Water, Sanitation, Hygiene, and Poverty analysis report, the MDG for sanitation was not met but good progress was made in reducing open defecation in rural areas – over 40 million people built basic latrines (all types) – while in urban areas good progress was made with 8 million people moving up the sanitation ladder from basic to improved toilet facilities.

The WB study estimated that, currently, there are roughly about 40 million people without adequate and safe water supply; about 72 million people without adequate safe and improved sanitation system and 93 million people who are not practicing safe hygiene. Such a stark evidence drives the need to design a more pragmatic, simple and practical strategy for a rapid change and development of WASH under the OWNP Phase 2 and beyond.

As can be seen from the tables presented in **Sub-section 16.7**, it is planned to serve 85% of the total rural population; this means that around 20.4 million more rural people will need to be served to achieve GTP2 targets. Similarly, it is planned to serve 75% of the total urban population; this means that around 5.7 million more urban people will need to be served to achieve GTP2 targets. The total 2020 unserved population of 42 million (totals in **Table 16.2** and **16.3**), estimated in this report through analysis of available data and government official reports, agrees quite well with the 40 million WB study figure.

The water now being delivered to people in both urban centers and rural communities may still be of low quality and unreliable supply. Consumers often resort to private vendor water supply with unregulated tariffs that burden consumers, especially the poor. Compounding the problem is the rapid urbanization and emergence of peri-urban

unplanned settlements creating slums and homelessness and those out of reach to the existing urban water and sanitation services.

In rural areas, inefficient water resource management and inadequate infrastructure, combined with poor sanitation and hygiene coverage, has a high health and economic impact. Moreover, there is continuous slippage from ODF back to OD in sanitation in rural areas and to some extent in water supply owing to depletion in groundwater tables, low resilience technology and often poor maintenance.

7.3 Strategy formulation

The OWNP has become more complex, with more and more multi-sector interfaces, and will benefit from an overall 10 to 15-year WASH Strategy. Enabling environment, new initiatives, multi sector approach and proposed implementation modalities are described in Section 10.

7.4 Organizational Direction

Vision - to see that all people in rural, urban and institutions are supplied with sustainable, climate resilient, safe and clean water and sanitation services.

Mission - to mobilize adequate resources through engaging multiple partners and donors with interest and use the human and financial resources efficiently for a lasting change in water and sanitation program in Ethiopia.

Goals -Lack of clean and safe water in quantity and Quality, proper human waste disposal, and liquid wastes management at point of generation are some of the focus areas for the OWNP strategy. The GTP Goal is to reach out to 85% of the rural population and 75% of the urban population with clean and safe water and 82% with improved sanitation. **(see table 7)**

In order to meet this government ambitious program, the followings are the key points to be considered during planning and implementation for both urban and rural water supplies and sanitation

- Develop capacity building strategy and implementation plan including a comprehensive technical support system to improve the functionality of schemes.
- Develop and implement cost effective alternative scheme management (Ownership) models
- Develop and implement professionalize management and leverage sector capabilities

7.5 GTP II and Sustainable Development Goals (SDG)

OWNP keep at both the GTP II and SDG Goals in focus as the program develops to go forward in ensuring a sustainable WASH service to all people in Ethiopia. Phase II however is more focused in achieving GTPII goals. The strategic overview of SDG for rural and urban water supply is depicted in the following tables.

Table 7-1: Strategic Overview for Rural Water Supply

Linkage with the SDG	Goal	Result	Indicators	2020 Target
Goal 3⁝ 6.1⁝ 9.1	Improve safe water supply	Increase safe water supply coverage	Increase Rural Water Supply Access Coverage as per GTP-2 Standard Service Level with Improved Water Supply Schemes in %	85
Goal 3⁝ 6.1⁝ 9.1	Ensure sustainability and reliability of safe water supply	Increase safe water supply coverage	Increase Rural Water Supply Access Coverage as per GTP-2 Standard Service Level with Rural Piped Systems in %	20

Linkage with the SDG	Goal	Result	Indicators	2020 Target
		Reduce Rural Water Supply Non-functionality	National Average of Non-functional Rural Water Supply Coverage in %	7
Goal 3; 6.1; 9.1	Ensure Water Quality and Water Safety of Water Supply	Strengthen Rural Water Supply Water Quality and Water Safety Monitoring System	Woredas Having Water Quality and Water Safety Monitoring System in %	100%
Goal 3; 6.1; 9.1	Increase Rural Water Supply Access	Increase the Number of Water Supply Beneficiaries	Number of Rural People Planned to be Provided Water Supply Access as per GTP-2 standard Service Level	20,410,759-

Table 7-2: Strategic Overview for Urban Water Supply

Linkage with the SDG	Goal	Result	Indicators	2020 Target
Goal 3; 6.1; 9.1	Improve safe water supply	Increase safe water supply coverage	Increase Urban Water Supply Access Coverage as per GTP-2 Standard Service Level with Piped systems in %	75
Goal 3; 6.1; 9.1	Ensure sustainability and reliability of safe water supply	Improve continuity of urban water supply	National Average of Continual Urban Water Supply in hours/day Among Towns of Category 1 to 3	16
		Reduce Unaccounted for Water (UfW) for Urban Water Supply	National Average of UfW of Urban Water Supplies in % Among Category 1 to 3 Towns	20
Goal 3; 6.1; 9.1	Ensure Water Quality and Water Safety of Water Supply	Strengthen Urban Water Supply Water Quality and Water Safety Monitoring System	Urban Water Supply Utilities Coverage Among Category 1 to 3 Towns Having Water Quality and Water Safety Monitoring System in %	100%
Goal 3; 6.1; 9.1	Increase Urban Water Supply Access	Increase the Number of Water Supply Beneficiaries	Number of Urban People Planned to be Provided Water Supply Access as per GTP-2 standard Service Level	5,648,901

7.6 Purpose of formulating OWNP Phase II Strategy

The purpose is to provide a strategic approach to accomplish OWNP objectives based on an in-depth analysis of internal factors and external influences such as the 1) 2013 OWNP document 2) WIF document 3) GTPII document and indicators 4) OWNP Phase I review report 5) SDG indicators and challenges that are influencing integrated WASH approaches for sustainability.

A strategic action plan for WASH is designed to provide a roadmap for accomplishing specified goals and provides clear communication to stakeholders such as financiers, partners and staff engaged in the change process. Strategic planning is based on identified gaps or challenges, deal with the challenges and plan where we want to be.

The principle driver for the WASH sector under Phase II of the OWNP is the GTP2. The strategy is guided by the directives, objectives, goals and target of GTP II. Hence, WASH strategy is designed for water supply and sanitation based on GTP II goals, strategic objectives and indicators (table 9 (Table 9).

7.7 Rationale

It is now considered that the OWNP complexity, with more and more multi-sector interfaces, will benefit from an overall 10 to 15-year OWNP WASH Strategy. The strategy is to:

- Initially meet by the Government of Ethiopia **Growth and Transformation Plan, GTP2**
- Meet **SDG targets** or alternative targets ore appropriate to Ethiopia capacity and government objectives
- Create an **Enabling Environment** whereby these ambitions can be met for water supply, sanitation and hygiene (WASH)
- Incorporate **New Initiatives:** utility regulation, clustering, CR-WASH[48], refugee areas, delegated management, very deep wells, renewable energy, micro-sanitation plans, etc.
- Increasingly adopt a **Multi-Sector Approach** to take account of integrated WRM, SWM, Industrial waste control (liquid gas, solid), employment, gender, etc.
- **Accelerate Implementation** through by national, regional, zonal, woreda and urban authorities in collaboration with DPs, CSOs and private enterprise

It is also observed that in order to meet the government's ambitious program, the OWNP Phase 2 will require immediate significant key actions and goals which need to be considered during planning and implementation for urban and rural water supplies and sanitation. The actions/goals need to be fully established and formalized under long-term OWNP activities (to 2030 and towards SDG targets) in order to create a robust water and sanitation sector able to meet the needs of urban and rural WASH in Ethiopia.

The approach is summarised in **Table 7.1** above, articulated further in terms of GTP2 target in **Sub-section 7.6** and actions are detailed in **Sections 9** (Short to medium Term Recommendations) and **Section 10** (Long term Recommendations).

It is noted that:

- MoWIE is now shifting its focus from construction of new schemes to ensuring the sustainability of existing schemes and the proportion of rehabilitation to new build appears to be increasing with time.
- Behaviour (or awareness) change is needed as much at policy and management levels as it is at community and household levels, particularly for urban sanitation. Similarly, awareness of business planning and accountability across all sectors is low and needs to be improved and promoted.
- There is an urgent need to review water tariff strategy, since tariffs in many cases are currently set at town or Woreda levels that are well below the ability to pay. There will, however, be cases, particularly for piped water supply system involving deep boreholes with associated high-power costs, where operational subsidies will be required to ensure minimum levels of service are maintained (at least 25 l/c/d).

[48] See previous discussion, 4.7.2: It is proposed that "Development of Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia" be termed CR-WASH as more concise than the previously termed "CR-WASH

- In the longer-term, tariffs are set and endorsed by the water board and endorsed by water authority. It will be the role of a future utility regulator to approve tariffs based on technical performance and financial analysis, free from political interference (as is normal for utility regulators worldwide).
- National guidelines and manuals are required to prescribe design standard and technology selection appropriate to levels of service, to be updated from time to time based on such things as sharing of good practice, research and development, progress on groundwater exploration mapping, water safety, solar power, CR-WASH, urban sanitation, pastoral sanitation, etc.
- Currently there is a move to legalize WASHCOs and strengthened the capacity of the committee to properly manage the scheme and to introduce a rural utility approach and "professionalization". WASHCOs will remain in place for point source schemes. However, longer term, Rural Pipe Supply systems could be absorbed into large (approximately zonal sized) publicly owned utilities for both urban and rural to ensure economy of scale for reasons that include regulation, fast-tracked procurement and implementation, operation, inventories, asset management, quality control, monitoring and evaluation, investment leverage, etc.
- There is a need to reduce the time for revising and finalizing designs and bidding documents since, on average, the actual time between the hiring of implementation consultants and the start of bidding has been more than two years. These delays have been due to many factors including, most importantly: (i) the review, revision, and approval of changes in project scope, especially major reductions in scope necessitated by large cost escalations due to inflation, (ii) lengthy review and approval of final designs and bid documents and (iii) long-drawn-out bidding processes.
- Although transparency in bidding for both consultants and contractors is essential and should not be compromised, the regional bureaus should take immediate steps to (a) reduce time for review and approvals and (b) ensure a pipeline of well prepared "bankable" projects able to both attract funding and also ensure timely delivery of services.
- At federal level (MoFEC), (1) the rules should be changed to allow autonomy of regions to deal directly with funders, but in collaboration with regional BoFECs and (2) delays in financial reimbursement to the regions at the beginning of each EFY should be eliminated.
- Government needs to provide swift additional funding or for the program to embed more realistic price and physical contingencies based on past project records and performance. Alternatively, as it has proposed from the regions, the plan budget for imported equipment should be reserved in Euro or US dollar to manage budget scarceness due to escalation.
- It is also extremely important for government (MoFEC) to give tax breaks and quick letter of credit approvals for import of critical WASH plant and equipment, where these are not manufactured in Ethiopia to the required specifications. Such equipment includes water drilling machines, pumps, generators, vacuum trucks, laboratory equipment, etc.
- DBO (Design, Build and Operation) contracts should be considered by the regional bureaus as a possible means to deliver projects in line with time, cost and quality.
- The majority of water projects in Ethiopia are based on groundwater so that the current program of hydrogeology mapping needs to be accelerated and expanded to all parts of the country but prioritizing areas where high borehole failure rates are occurring. Where groundwater sources are known to be limited, then (1) artificial aquifer recharge needs to be considered in collaboration with partners responsible for catchment management and (2) alternative surface water sources need to be thoroughly investigated.
- There is a need for relevant knowledge and understanding of modern utility management practices and to promote a culture change in terms of service delivery. This needs to be addressed through water and sanitation sector reform.

7.7 Detailed OWNP Phase 2 Strategy

It is required to accomplish OWNP objectives based on an in-depth analysis of internal factors and external influences such as the 1) 2013 OWNP document, 2) WIF document, 3) GTPII document and indicators, 4) OWNP Phase I review report, and 5) SDG indicators and challenges that are influencing integrated WASH approaches for sustainability.

A high-level overview of the OWNP strategy has been presented in **sub-section 7.4**. In detail, the Phase II of the OWNP has been developed (and as fully detailed in **Section 16**, OWNP Phase 2 Completion Program Plans and Costs) for water supply and sanitation based on GTP II strategic objectives, goals, performance indicators, core activities and results as shown in **Tables 7.3** and **7.4** below.

Table 7-3: Phase II Water Supply Objectives, Goals, Performance Indicators, Core Activities and Results

Strategic Objectives	Goals	Performance Indicators	Core Activities	Results
1. Increase safe water supply upgrading the service level and improve urban waste water management system	1. By 2020 Provide safe and adequate water supply to rural communities with minimum service level of 25 l/c/d within a distance of 1 km. from the water delivery point. Coverage to reach 85 % of the rural population of which 20% is with RPS	Percent of households in rural communities served with Clean, safe and adequate water supply access at a rate of 25 l/c/d within 1 km. with on spot supply and RPS	• Regions map woredas by service levels and prioritize woredas to provide improved and safe water supply • Woredas involve and mobilize communities to participate in planning, construction and management • Organize governance mechanism (WASHCOMs) With at least 50% women members. • Train WASHCOMs on O&M, water handling, book keeping and reporting	Rural communities in Woredas are provided with conventional, adequate and safe water with well-established governance system ensuring sustainability.
	2. By 2020 Provide safe and adequate Water service to urban communities	Percent of towns/cities provided with 100l/c/d for category 1 town/cities; 80 l/c/d for category 2 town cities; 60 l/c/day for cat. 3; 50 l/c/d for category 4; up to the premises and 40l/c/d for category 5 towns/cities within a distance of 250 m with piped system; Coverage of 75% of the urban population	• Regions map and categorize towns and provide adequate and safe water • Towns establish utilities and utility management mechanism • Towns or town water board set tariffs for water usage • Towns/water boards establish O&M program, tools and spare parts • Towns/water board conduct continuous capacity building on O&M, water treatment, preventive maintenance, record keeping, water safety plan to sector staff	Towns/cities are provided with safe and adequate water as per their category
	3. By 2020 Carry out study and design for urban waste water management system	Percent of the 36 category 1,2,3 towns and cities Build WWM infrastructure for 6 towns /cities with a population of 200,000 and more	• Towns/water boards/city administrations identify and document background information on the problem • Set budget and time line to conduct feasibility studies on WWM program • Organize/hire professionals to design appropriate WWM system for the selected town/city	Urban waste water management system is designed

Strategic Objectives	Goals	Performance Indicators	Core Activities	Results
2. Ensure good governance in rural water supply enhancing sustainability, effectiveness, efficiency and climate change resilience of the services	4. By 2020 Decrease RWS Non-Functionality rate of water supply system in urban and rural communities	Percent achievement of NFR from the present 11.2 %-to the target of 7%	• Regions together with Woredas map nonfunctional water systems by category • Identify common problems • Design mechanism/budget and organize manpower and rehabilitate un functional water systems • Woredas with support from regions and NGOs etc. set a maintenance crew with tools and spare parts and communication system to maintain pumps and reduce downtime and non-functionality rates.	Number of nonfunctional water systems are decreased to 7%
	5. By 2020 Empower women in WASHCOs management including in decision making	Percent of WASHCOMs that increase membership to 50% and more	• Woredas involve communities including women in the planning process • Discuss with communities on roles and responsibilities in WS management • Establish WASHCOMs with women participation of at least 50% • Train WASHCOMs on book keeping, O&M, setting tariffs etc	WASHCOMs are established with 50% women members
	6. By 2020 Strengthen RWS community management through legalization of WASHCOs	Percent of RWS that legalize WASHCOMs by region	• Regions register the number of WASHCOMs • Regions advocate on the importance of legalizing WASHCOMs so that they function legally following government rules • Regions continue on capacity building to WASHCOMs to strengthen their water management roles.	• 100% of WASHCOMs in all regions are legalized
	7. By 2020 Establish supply chain for low cost WS technologies and spare parts	Number of Private sectors involved in Water supply by category established in each region/ woredas	• Contact with Micro and Small Enterprise Agency and discuss Private sectors need for water supply • Discuss with TVET to develop curriculum for private sectors training • Establish systems, linkage mechanisms of the private sectors to funding agencies	Regions have motivated private sectors and established supply chain for Water supply.
	8. By 2020 Establish WS extension supporting system at kebele level to enhance implementation of household and communal level	Number of woredas in each region that established support mechanisms for self-supply in woredas	• Woredas discuss the advantage of self-supply and the support they can get from woredas • Woredas organize kebels and communities to undertake enhancing self-supply water supply system • Woredas with support from regions prepare O&M manuals	100% Woredas will have water supply extension support system at kebele level.

Strategic Objectives	Goals	Performance Indicators	Core Activities	Results
	self-supply water and improve O&M of RWS		• Establish water safety mechanism from the source to use with community using self-supply and other on spot water systems	
	9. By 2020 Ensure rural water supply safety through water quality monitoring and water safety planning and implementation	Number of woredas in e ach region that established water quality monitoring program urban and rural areas	• Train selected water surveillance officers from among the staff • Purchase portable water analysis kits with adequate supply of reagents • Prepare a protocol on frequency of testing, recording and reporting • Have in stock water disinfecting chemicals	100% Woredas established mechanisms for rural water supply quality monitoring
	10. By 2020 Establish ground water monitoring and catchment protection system around water supply sources to be implemented by rural WASHCOs.	Number of WASHCOMs that has establish catchment protection and monitoring mechanism in woredas in each region	• Conduct surveys on all water systems and identify areas of concern • Plan and design protection mechanisms such as protecting from flood, animals, open defecation etc …	100% Woredas established groundwater monitoring and catchment protection mechanism.
3. Ensure good governance in UWS enhancing sustainability, r=effectiveness, efficiency and climate change resilience of the service	11. By 2020 Decrease Non-Revenue Water for urban communities	Number of towns that decrease NRW from the 39% to 20% by 2020 for UWS utilities of category 1-3	• Establish a water policing mechanism to identify NRW hot spot areas	Nonfunctional water for urban areas decreased to 7%.
	12. By 2020 Improve water service hours in the 24 hours in urban areas	Number of towns that has Improved UWS continuity to 16 hrs. per day excluding WS delivery through public taps for UWS utilities of category 1 to 3	• Assess possibilities of raising service hours • Enhance capacity to meet the plan.	Water supply service continuity increased to 16 hours per day

Strategic Objectives	Goals	Performance Indicators	Core Activities	Results
	13. By 2020 Enable cost recovery mechanism for urban water supply system	Number of towns that enable category 1,2 and 3 towns recover their investment cost at least by:80% Category 4 by 60%Category 5 by 30 %And O&M cost by 100% for all towns	• Prepare an advocacy statement to enable the establishment of cost recovery mechanism • Discuss the issue with water board and beneficiaries • Involve communities/beneficiaries before setting tariffs	100% of Urban towns/cities utilities have established water tariffs
	14. By 2020 Ensure UW safety through water quality monitoring system and water safety planning and implementation for UWS utilities of category 1 to 3	Number of regions that established water quality monitoring and reporting program in woredas	• Train selected water surveillance officers from among the staff • Purchase portable water analysis kits with adequate supply of reagents • Prepare a protocol on frequency of testing, recording and reporting • Have in stock water disinfecting chemicals	1100% urban utilities established water quality monitoring system and prepared and implemented water safety plan.
	15. By 2020 Establish ground water monitoring and catchment protection system around WS sources to be implemented by urban WS utilities	Number of towns of water utilities in urban areas that establish urban water catchment protection mechanisms.	• Establish ground water monitoring unit with the necessary tools • Conduct surveys on all water systems and identify areas of concern • Plan and design monitoring and protection mechanisms such as protecting from flood, animals, open defecation etc.	100% urban utilities established groundwater level monitoring and catchment protection system
4. Build the sub-sectors capacity	16. By 2020 Conduct capacity building to higher and middle level professional, artisans and caretakers	Percent achievement in training and engaging the subsector 4, 374 higher and 13,000 medium level professionals and 510,000 artisans and caretakers and ensure that involvement of women in this regard is 25%	• Design training manuals for higher, medium professionals and artisans • Prepare the necessary supporting training materials • Use trained trainers for effectiveness	Capacity building is conducted to higher, middle WASH professionals and artisans.

Strategic Objectives	Goals	Performance Indicators	Core Activities	Results
	17. By 2020 Establish independent WS and Wastewater service regulatory agency to ensure high service quality	Number of regions that has processed the establishment of regulatory agency for water supply and waste water services.	• Design policy or identify existing policy to establish regulatory agencies • Advocate that higher political leaders agree and endorse to establish the agency as per government regulation	Water and waste water management regulatory agency is established
	18. By 2020 enable category 1,2, 3, and 4 water supply utilities have in their organizational structure responsible section for Waste water management	Number of Waste water management structure is established in all 1,2,3,4 category water utilities	• Establish a unit for waste water management • Establish an integrated and coordinated mechanism with other institutions	A unit for waste water management within the utilities for category 1,2,3,4 towns is established
	19. By 2020 Increase the involvement of the private sector in the WS activities particularly in O&M of urban water supply utilities	Number of new private sectors in water utilities who are engaged in water supply and O&M.	• Map existing private sectors who would take the business • Advocate about the business and attract private sectors to take up the business of O&M • Design a capacity building program for the private sectors	100% urban utilities have engaged private sector in their O&M engagement
	20. By 2020 Strengthen WASH integration to meet the objectives of OWNP and establish coordination with the Ministry of Urban Development and Construction Affairs at all levels in all urban WASH interventions	Number of integration and coordination initiatives taken by OWNP with like ministries like ministry of urban development.	• Advocate the health, development and economic impact of WASH with like ministries • Discuss ways and means to integrate the program and for coordinated action for WASH in urban areas • Establish standing committees of professionals overlooking design and intervention program • Establish forums for wider learning and sharing	OWNP has integrated its national WASH plan with like ministries.
	21. By 2020 Implement national ICT based M&E and MIS system for the subsector which enables to capture, collect, analyze and report the data of the sub-sector staffs and service beneficiaries disaggregated in sex and age.	Number of regions that established a functional ICT based M&E and MIS system	• Learn and share experiences of regions and NGOs and bilateral organizations who have started ICT based monitoring in Ethiopia • Speed up the ICT based national program and record real time information in the MIS • Establish mechanism for reviewing and learning	WASH M&E and MIS system established

Table 7-4: Phase II Sanitation and Hygiene Strategy (Rural/Urban/Institutional)[49] Objectives, Goals, Performance Indicators, Core Activities and Results

[1]Strategic Objectives	Goals	Performance Indicators	Activities	Result
1. Establish community centered approach to enhance sustainable sanitation and hygiene services and behaviors Kebeles in all regions	1. By 2020 introduce community centered approach to sector staff at all levels particularly to woreda level (Primary Health Care Unit staff, Kebele WASH team, Kebele leaders, HEWs, HDAs, Limat Budins, WASHCOS and Agricultural extension agents in all Kebeles in the country)	Number of advocacy initiatives undertaken to establish common ground with sector staff and other stakeholders.	• Prepare advocacy package prepared to suit the level of local residents, sector staff and officials • Include in the advocacy meetings stakeholders such as local NGOs, religious leaders and schools • Conduct a number of meetings to form common ground on the need of involving communities for behavior change program	Common ground with sectors and stakeholders and community members established.
2. Improve access and equitable improved sanitation and hand Washing practices	**2.** By 2020 Increase the availability and consistent use of improved latrine from the present 28% to 82% In rural areas.	Percent of improved sanitation coverage in each region by woreda	• Identify respected, trusted and prominent residents, teachers and women affairs of a community together with HEW, WHDA • Create awareness on the problem of poor sanitation and hygiene to health and development • Train them on how successfully they carry out and sustain changes if committed and make their community ODF • Demonstrate simple improved sanitation construction and hand Washing devise using job aides/pictures • Select community chairperson preferably women or religious leader and secretary (preferably HEW) for the committee • Design an action plan on the way forward	Improved sanitation system with hand Washing increasing in all regions
	3. By 20 20 Increase proportion of ODF communities In kebeles from 18 to 82%	Percent of kebeles in each region who have achieved ODF	• Design a follow up mechanism and a support program to the committee established in communities in all kebeles	ODF Kebeles are increasing in number in all woredas in Ethiopia.

[49] ***Note: the sanitation and hygiene strategic objectives and target is adopted from the NHEHS and SAP, 2017***

	4. By 2020 increase hand Washing with soap and water from the present 17% to 82%	Percent of households in kebeles who have achieved hand Washing with soap in each region.	• Design a follow up mechanism and a support program to the committee established in communities in all kebeles	Hand Washing with soap has increased in all Kebeles/ woredas in Ethiopia
	5. By 2020 Establish supply chain for sanitation components and low cost WS technologies and spare parts	Number of private sector companies established and started supply chain activities for WASH products	• Map existing private sectors who would take the business • Advocate about the business and attract private sectors to take up the business of O&M • Design a capacity building program for the private sectors	Supply chains for sanitation established in all woredas in Ethiopia
3. Improve Institutional WASH Services	6. By 2020 100% of schools will have hand Washing promotional materials in their schools	Percent of schools in each region with hand Washing facilities with adequate provision of running water and soap	• Design simple interactive hygiene messages and distribute to all schools in woredas • Advice schools to use all walls, latrine shades, trees to be talking walls and trees with appropriate behavior change messages (Use soap to WASH your hands after toilet etc.) • Prepare print materials such as posters to communicate WASH	Hand Washing promotional materials are made available and displayed in all schools in Ethiopia
	7. By 2020 Improve full package WASH access from the present 3.2% to at least 40% of schools including MHM	Percent of schools in each region that have been provided with complete package of WASH services in Schools	• Advocate to funding agencies and government about the importance of providing full package WASH for schools than only one or two interventions • Arrange the construction of a functional MHM facility in schools even using local materials	Institutions, donors and government support full package WASH service to schools.
	8. By 2020 Provide improved and gender segregated sanitation facilities with hand Washing from the present 36% to 75% of primary schools and 100% of high schools including MHM	Percent of schools in each region with adequate and gender segregated and improved sanitation systems	• Organize parents and teachers' association to participate and support to construct separate latrine for boys, girls, teachers • Organize fund raising festivals, or school days to raise money to support latrine construction	Gender separated improved sanitation and MHM facilities are increasing in all schools

			• Plan to use revenues usually from coffee, crop, grass, and wood sales to support latrine **construction.**	
	9. By 2020 100% of health facilities with full package of WASH facilities including MHM facilities 100%	Percent of health facilities with full package of WASH services	• Advocate for the need of providing full package to health facilities	Institutions, donors and government support full package WASH service to schools
4. Water Safety and water quality control	10. By 2020 Increase proportion of households using correct and consistent water treatment and safe storage from 10 to 35%	Percent of households practicing point of use (POU) water treatment.	• Discuss the need of enhancing point of use treatment with the community centered committee • Discuss with water safety supply chains (Wuha agar, wuha telel) to make water disinfectant to the locality • Arrange with local drug store to also have Wuha agar etc. for sale to communities	Point of use treatment of water is practiced in households in Ethiopia
5. Improve outreach communication for behavior change using communication support materials	11. By 2020 prepare and provide pictorial job aides, operational manuals, implementation guidelines for use by Health Extension Workers to support facilitation of behavior change in communities	Percent of Kebeles provided with set of job aides including latrine construction, hand Washing, water safety measures, personal and environmental hygiene materials	• Explore WASH communication materials availability in the sector ministries • Evaluate the content and determine whether to use it or not • Design new or additional communication products • Kebele level HEW will need pictorial job aides which are available in the ministry of health	Outreach do-able behavior change program is enhanced using job aides in Kebeles in Ethiopia.

7.8 Enabling Environment

The strategy will be facilitated with different approaches and inputs (see graphics below) and implemented by national, regional, zonal, woreda and urban authorities in collaboration with DPs, CSOs and private enterprise

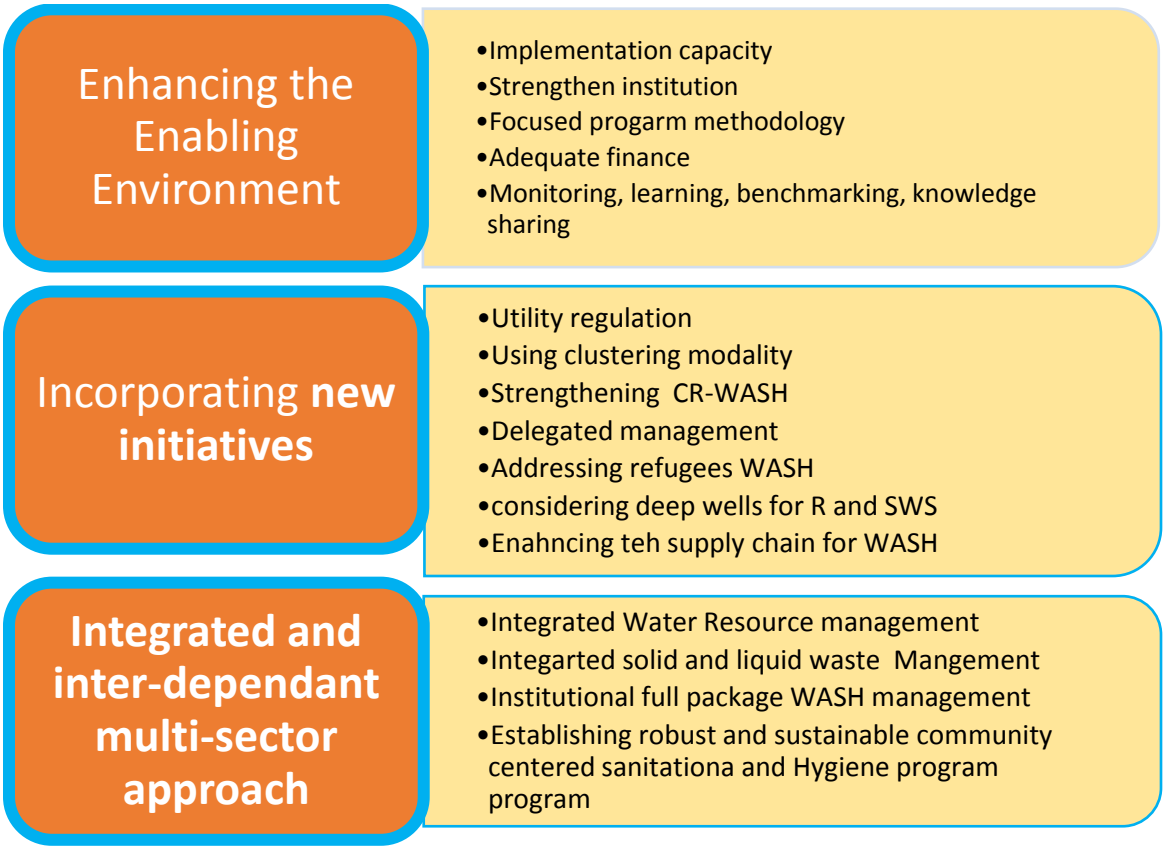


Figure 7-1: Program Facilitation Modality

New initiatives have been developed since conception of the OWNP and as developed through the OWNP review process involving as many as possible national, regional, development partner and other stakeholders. Existing and new approaches are described in **Section 9** (short to medium term) and **Section 10** (long term) below to cover the period from 2018 to 2030 (10 to 15 years' horizon).

This sub-section suggests ways in which the OWNP may be moved on to more holistic, long term, approaches. It suggests generic structures and approaches (both for implementation and operational) for the Ethiopian WASH sector for the next decade.

In order to translate the designed strategy into action, tackle bottlenecks identified in the Phase I review and to lay a stable foundation for the Ethiopia WASH sector, then a strong "Enabling Environment" will be needed.

Figure 7.2 below illustrates the complex enabling environment required at multi-sector level to ensure WASH service delivery to all citizens of Ethiopia in as short a time as possible. To achieve the GTP2 targets by 2020 will require radical and innovative approaches driven partly by the new CR-WASH Program, partly by the existing OWNP principles and pillars and partly by creating a new enabling environment which may be depicted by the schematic. This indicates which "enablers" fall directly under the OWNP and which may be regarded as "multi-sector".

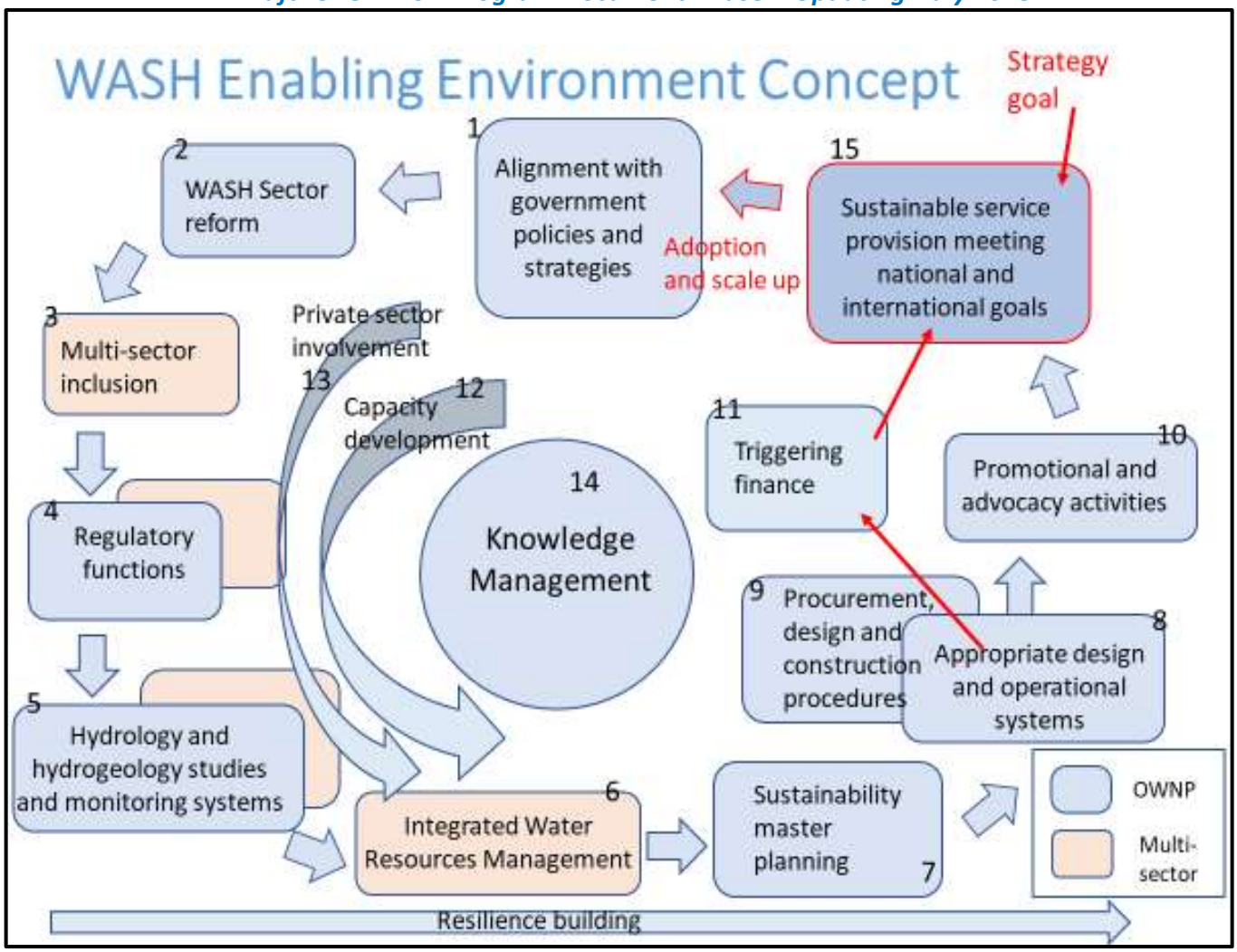


Figure 7-2: WASH Enabling Environment Concept

Most importantly, OWNP overall objectives cannot be achieved without:

- knowing what has been done, what is being done and what is planned (knowledge management)
- having the capacity to do it (sector reform)
- sustainable water resources (hydrogeology and data base)
- sustainable systems (planning design and operations)
- championing change (promotion and advocacy)
- regulatory controls (planning and operations)
- funder confidence

8. Institutional Roles

8.1 OWNP signatories

The WIF has been agreed between four ministries (MoWIE, MoH, MoE and MoFEC) whose roles and responsibilities are further defined in a Memorandum of Understanding (MoU) signed in November 2012, to support an integrated and resilient One WASH National Program that addresses the needs of rural, urban and pastoralist communities, schools and health posts in a more integrated manner and reduces the administrative fragmentation of WASH service delivery.

The specific roles and responsibilities of the four ministries in implementing the Program are described in the MOU where they have committed themselves to:

- Assign an appropriate representative to the National WASH Technical Team (NWTT)
- Establish a WASH Program Management Unit (WPMU) and designate a WASH focal person to liaise between the WPMU and the National WASH Coordination Office (NWCO)
- Prepare and submit to the NWCO and to NWTT an annual WASH Plan of Actions
- Conduct joint review and monitoring of programs

8.2 Specific Roles of Government and Partner Organizations

Table 8-1 -5: Specific Roles of Government and Partner Organizations

Organizations	Level	Summarized Roles and Responsibilities
Ministry of Water Irrigation and Electricity	Federal level	Water and sanitation policy and strategy, coordination and monitoring
	Regional level	Design and contracting of piped water supply schemes; Oversee woreda Implementation of schemes such as hand-dug wells or spring catchments.
Ministry of Health	Federal level	Preparation of Health Sector Development Plan, HSDP V, to achieve the health GTP II 2020.
	Regional level	Decentralized plan, implemented by regional health bureaus and woreda health offices and primary health care units, aims to scale up delivery of primary health care services at district (woreda) level and through the health extension Program organized at the kebele level.
Ministry of Education	Federal	Design School WASH strategy, action plan and implementation guideline to enhance clean and safe water supply, sanitation services and hygiene practices
	Regional level	Establish a school latrine cleaning culture, and hand Washing and menstrual hygiene management in all schools; enhance maintenance of system.
Ministry of Finance and EC	Federal level	Financial management of the Program and allocating and channeling resources and monitoring fund utilization (Ref. WIF for details).

Organizations	Level	Summarized Roles and Responsibilities
Development Partners	Federal level	These international and bilateral organizations have for many years been important supporters and partners to the government efforts in WASH improvement, helped to establish the Consolidated WASH Account (CWA) and are expected to increase contributions as well as to be part of review processes and capacity building
National One WASH Coordination Office	Federal level	Oversee the CWA. Coordinate the identification and mapping of CSOs working in WASH at all levels and collect information on the program scope, location, type of interventions. resources available for implementing WASH activities. Multi-sector coordination with stakeholders outside the MOU signatories to work together to support sustainable and resilient WASH services to all people in Ethiopia. These includes Ministry of Urban Development and Construction (MoUDC), Ministry of Agriculture and Natural Resources (MoANR), Ministry of Livestock and Fishery (MoLSF), Ministry of Environment, Forest and Climate Change MoEFC), Ministry of Federal and Pastoralist Development Affairs (MoFPDA) and National Disaster Risk Leadership Commission (NDRLC) etc. Coordinate M&E, organize periodic program reviews (JTR and MSF), make available aid memoir and other field reports, stimulate learning and knowledge management, compile biannual, annual reports and disseminate
Civil Society Organizations (CSO)	At all levels	Deliver water and sanitation projects, establishing management structures, in hygiene promotion, piloting new approaches, reaching remote areas and groups, supporting and undertaking studies, evaluation and learning and knowledge sharing and participating in sector reviews and evaluations (semi-annual JTR, annual WSF and annual MSF).
Private Sectors	At all levels	Implementing most construction of water supply schemes and improved sanitation in urban and rural areas, provides consulting services for studies, designs and construction supervision, lead the establishment of suply chain for WASH products and supplies such as spare parts, maintenace repair services, in supporting self supply activities and in social/sanitation marketing. Corporate Social Responsibity (CSR) activities have the potential for companies (often those that use water) to contribute to monitoring, safe water use and environmental protection in their locality.
Banks and Microfinance	Federal and Local level	Play a very significant role in Ethiopia's grant based WASH development, usually through federal level soft loans, follow principles of the WRDF, provide loans to utilities, providing financial services to communities, particularly for CMP, self-supply activities and sanitation marketing through WASHCOMs for the purpose of procurement, construction, rehabilitaton, replacement, insurance, and credit to SMEs for providing WASH services and supplies

Organizations	Level	Summarized Roles and Responsibilities
Communities	Local level	WASH Committees (WASHCOs) and in some cases Associations of WASHCOs play a role in planning, managment, operation and maintainance of water points follow strategies and procedures developed by NGOs for capacity building , promoting sanitation and hygiene practices among households in communities (HEWS, WHDA), organize the Community Centered Hygiene and Sanitation Program (CCHSP) approach through organizing and providing focused training to permanent, respected and trusted community residents which include teachers, religious leaders, elders/clan leaders etc. for a rapid and sustained changes in WASH behaviors. (see Section **Annex 5** for details)

Short to Medium Term Recommendations

9.1 Introduction

Ethiopia has started on a unique integrated approach to formulation, coordination and delivery of WASH. Much has been achieved towards MGD and GTP1 targets as described in the separate OWNP Phase 1 review report. Following from this, the OWNP Phase 2 short to medium-term objectives are to fulfil the GTP2 targets.

A first stage of CR-WASH (Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia) is included under the short to medium term activities.

As described in the strategy **Sub-section 7.4**, the OWNP Phase 2 will require significant immediate attention to the following key areas:

9.2 Water resources

9.2.1 Introduction

The majority of water projects in Ethiopia are based on groundwater so that the current program of hydrogeology mapping needs to be accelerated and expanded to all parts of the country, but prioritizing areas where high borehole failure rates are occurring. Groundwater supply is becoming increasingly stretched due to both local human practices and worldwide climate change. Where groundwater sources are known to be limited, then (1) artificial aquifer recharge needs to be considered in collaboration with partners responsible for catchment management and (2) alternative surface water sources need to be thoroughly investigated.

9.2.2 Water resource development

Water Source Development should be based on best available hydrological and hydrogeological information, interpreted by qualified professionals. Establishing reliable sustainable yields to balance demand requires good hydrogeological skills, the necessary equipment and funds and step by step approach. Alternative water supply and energy sources should be studied at each project site to meet present and future water, fully taking into account the impact to/from other existing and proposed projects in the same surface and subsurface catchment zones.

Long term monitoring stations (purpose-built piezometer tubes, capped wells and pumped wells with flow meters) will be required to monitor levels, quality and discharge to check on long term resource depletion or improvement. Trials may be undertaken on artificial recharge to improve sustainability of relatively shallow aquifers not topped by aquicludes.

9.2.3 CR-WASH

A critical issue is unproductive wells in some areas of the country, particularly in arid regions such as most parts of Somali region, which faces challenges due to the salinity issues. According to JICA, the deeper the borehole, up to 300m depth, high salinity is a critical problem. It becomes potable as deep as 600m depth, but the problem is that there are a limited number of private companies in Ethiopia who have machineries/equipment that has capacity to drill to such depth.

This subject is “multi-sectoral” since there are many competing pulls on water resources (agriculture, hydropower, pastoral, urban and rural) and many risks (industrial, commercial and domestic liquid and solid wastes, refugees, IDPs and climate influenced emergencies). Although water resource management and monitoring are vested in the MoWIE and regional water bureaus, in practice both water and environment bureaus have little control over public and private water resource exploitation and over pollution of aquifers and rivers.

9.2.4 IWRM

In all cases, conservation of water to reduce groundwater abstractions (and also surface water use) through integrated WRM (including agricultural and forestry practices) must be considered in sustainability master planning and feasibility studies. Enhanced groundwater recharge through agricultural/forestry husbandry and engineering works to reduce runoff and increase recharge will also be beneficial, as will reduction in water wastage and NRW. This will need enhanced harmonization and collaboration between the many stakeholders inside and outside of the OWNP signatories.

Development of water resource master plans should be carried out under the umbrella of WRM multi-sector activities, including CR-WASH. Groundwater development should be done in parallel with innovative systems for catchment protection to improve recharge, involving agriculture, irrigation and livestock authorities and enterprises.

9.2.5 Supply chains

Supply chains need to be improved that better anticipate procurement needs and to create stocks of most common spare parts for drilling equipment to avoid delays. This will likely involve easing of import restrictions (approvals of letter of credit) and applying tax breaks: Import taxes held at government level do not benefit WASH implementation where funding will come from a multitude of sources.

9.2.6 Water abstraction licensing and pollution control

Above all, water abstraction licensing and pollution control needs to be coordinated and based on best available hydrological and hydrogeological (quantity and quality) data:

- The current practice of issuing abstraction licences independently by water bureaus and environment departments will results in unsustainable abstractions and needs to be urgently addressed and replaced by a coordinated approach.
- Unchecked pollution from industrial and domestic (both point source and dispersed) may result in irreparable damage to aquifers and loss of water sources near to demand centres.

9.3 Technology innovation and mix

9.3.1 Introduction

There is an urgent need for a “technology shift” to reduce failure rates, improve resilience in the face of changing climate, demographic shifts, and environmental impact of rapid urban, industrial and agricultural development, arid area encroachment, refugee areas, and competition for limited water resources, research and development in decentralized waste water treatment systems etc.

9.3.2 Renewable energy

Rural populations in Ethiopia are still not reached by the national grid. Although hydropower, wind farms, and solar arrays are, to a greater or lesser extent already major contributors to the national grid, probably only solar energy offers the potential for localized remote systems. Rural Afar and Somali area has extremely high solar irradiation and very limited grid access in remote areas. Biogas has potential at intensive livestock centers.

PV can provide a solution for large as well as small systems, but more trials need to be undertaken to establish viability for multi-village schemes where very large land area is needed for the arrays. Photovoltaic is estimated to be the most economical for small power system. PV systems are currently considered when the hydraulic power is from 200 to 1500 m-m3/day and a power rating of 0.5kW or less: In this case the PV system has been found to be viable.[50]

[50] MOH and MoWIE (2012) Design and construction Manual for WASH facilities in Health Institutions

While the upfront investment on solar based water supply schemes is higher than for generator driven systems, the financial costs on a life cycle basis are often more favorable due to the much lower running costs, related to the free supply of energy, improved reliability of photovoltaic and less moving parts to be maintained. There is also experience in Ethiopia that solar pumping systems are more reliable that conventional hand pump systems, although walking distances will be increased due to more centralized installation.

9.3.3 Water Safety

The majority of properties in Ethiopia, both urban and rural, rely on in-property water storage of one sort or another (roof tanks, ground level tanks, open containers, etc.): Such water will be bacteriologically contaminated due to negative mains pressures, crowding around wells, open jerry cans, poor water handling etc. and due to ineffectiveness of chemical disinfection under these conditions. This indicates the need at all service levels for "point-of-use water treatment systems" as complementary actions to ensure safety of water[51].

In general principle, there will be a need to establish a climate resilient Water Safety Plan (WSP) by instituting water surveillance program to prevent pollution sources, such as fencing the catchment area in rural areas. Another safety measure is to establish and or strengthen water quality monitoring program in the regions and woredas (but see limitations on laboratories described in **Sub-section 9.5.1**). Procuring the necessary field kits and reagents to be distributed to each woreda, designing monitoring manual and reporting protocol is essential.

Source chlorination may not be either feasible or protective in the rural context, especially if it is a well or spring water, because disinfection is only to the volume of water available at the time of chlorination. If chlorination is done in reservoirs the water will always be clean until new water is added. In both cases it is advisable to popularize "Point-of-Use Treatment" which may include boiling, filtration in addition to chlorination. Introducing other treatment options for chemical removal, softening hard water, treating high fluoride water with bone char or clay can be introduced in communities.

9.3.4 Decentralized wastewater treatment

Decentralized wastewater treatment systems (DEWWATS) need to be mainstreamed under OWNP as the currently only viable alternative in dense urban environments and where water supply to flush off-site sewerage is insufficient or unaffordable. It needs to be taken seriously due to dire environmental and health impact of poor sanitation in large towns and cities. However, DEWWATS have many hurdles in terms of ownership, operations, environmental impact, safety, safe reuse, etc.

Service delivery using centralized off-site sewerage involves three key issues that have been found in many such schemes throughout Africa:

- Having adequate water available to flush long sewers: Water supply systems are required that will increase current unreliable supplies of around 30l/p/d to all-year-round (including drought years) reliable supply of at least 100l/p/d and 150% of industrial and commercial demand (to allow for NRW loss)
- Using formative research tools to persuade customers to connect: This is often a roadblock to sewerage introduction, particularly in low income communities
- Introduction of full cost recovery for both O&M and loan repayments: Without very significant guaranteed operational subsidies, full cost recovery principle will likely limit sustainability of centralized sewerage

There is an urgent need to develop and use a range of DEWWATS technical options on a large scale in Ethiopia, due to medium rise housing policy, satellite housing and industrial and commercial centers, and countrywide shortage of water for full flush toilets, high cost and/or lack of available land, lack of sewerage and treatment work infrastructure and other factors. This means that increasingly sophisticated financially and environmentally

[51] USAID (PSI) have pointed out that point of use treatment may conflict with "safe-at-source" strategies but may be pragmatic at short to medium (to long?) term measure.

sustainable systems will need to be developed and rolled out on a large scale for the very dense urban environments that are increasingly appearing in Ethiopia.

On balance, it is likely that sustainability master planning will indicate the need for DEWWATS at least in the medium term and on a large scale. Centralized sewerage is likely to be constrained to city centers and high income and commercial areas. The IUSHSAP has a target to construct 200 DEWWATS within the first 5 years and 1000 DEWWATS within 10 years, as a pragmatic approach to address environmental issues in a risk averse way.

However, the full business case for DEWWATS has not yet been established, particularly related to the sophisticated supply chains and O&M systems that will need to be established and maintained in a financially and environmentally sustainable way; the full business case around DEWWATS therefore needs to be researched and trials carried out in parallel to, and so as to inform, master planning and inter-relationship agreements and contracts that need to be drawn up between owners, operators and the users of recycled liquids and solids.

9.3.5 Low cost urban Fecal Sludge Management

This subject is "multi-sectoral" since it involves labor, women's rights, solid waste management, economic impact of poor sanitation, etc. It has been noted that neither the 2013 OWNP document nor GTPII pays enough attention to hygiene and sanitation in urban areas.

There are a number of on-site and off-site sanitation options for human waste management system in urban areas. The most practical and affordable on-site system for slum areas in Ethiopia is to construct an improved pit latrine or a VIP latrine, which can have very good features of clean ability, less smell and long lasting service. However, public and shared latrines demand good operation and management practices.

Providing equitable, gender sensitive public latrines that would satisfy needs of women children and persons with disabilities with hand Washing facilities, shower facilities and cloth washing slabs to residents in urban areas is an essential public service. These can be based on viable business models when combined with other services (shop, water sales, and mobile phone top up, rest area). They also offer a platform to promote safe water, good sanitation and hygienic practices.

Having in place full time attendant, trained with simple maintenance and providing tools for maintenance will sustain the service and boost efficiency.

FSM business models require costing, financial modeling, delegated service management contracts, appropriate pit latrine, septic tank and cesspit emptying technologies, primary transport, tariff setting and collection, customer liaison, etc. Primary services are considered to include mostly low tech. activities from customer to transfer station gate. Secondary services are considered to include management of transfer stations, primary and secondary treatment processes, secondary transport, quality control of final products for re-use, liaison with users of final products, community relations with people living near to process units, marketing and sales.

- Of immediate concern is development of appropriate technology for emptying pit latrines (in some towns over 80% of inhabitants use pit latrines) that are inaccessible to conventional vacuum equipment or where the financial analysis indicates that use of vacuum trucks is financially unsustainable[52]
- FSM transfer stations may involve primary treatment of Fecal wastes through anaerobic treatment (see example **Annex 7**) or through other technology developed under DEWWATS research. Final treatment of Fecal sludge is best done on engineered drying beds, preferably covered and preferably close to transfer stations within built up areas so as to save on secondary transport.

Formative research should be used to determine the best route to overcoming blocks to appropriate FSM technology, where such blocks may be both at professional levels within utilities as well as at local worker levels. Viability investigations can be enhanced by formative research approaches including demonstration of practices

[52] This is clearly an area for R&D where labour orientated systems need to be considered and demonstrated as part of financially sustainable and equitable service delivery to all, not just to middle and high-income customers. See "A guide to strengthening the enabling environment for faecal sludge management, Experience from Bangladesh, Kenya and Zambia, WSUP, Nov 2017"

and understanding of benefits. The emphasis needs to be on appropriate planning of business options for interested community-based organizations and private entrepreneurs and companies.

9.4 Procurement and implementation

It is considered that to meet the onerous targets under GTP2 in terms of capital works will need an immediate shift towards contracting at scale and involving international tendering and supply chains. This will include promotion of international/national collaboration, learning from procurement models such as 8 towns work (UNICEF/DFID). The ambition should be to maximize use of national manufacturers, suppliers and contractors but not so as to hold up procurement and implementation through preferential tendering that might impede international suppliers and competition.

Government will have to streamline its procedures: As indicated in **Sub-section 9.2** above, supply chains need to be improved that better anticipate procurement needs and to create stocks of most common spare parts, for instance. This will likely involve easing of import restrictions (approvals of letter of credit) and applying tax breaks: Import taxes held at government level do not benefit WASH implementation where funding will come from a multitude of sources.

9.5 Capacity development

Note: See also **Section 11** below for further detailed recommendations for capacity building.

9.5.1 Capacity development for improved delivery of WASH services at all levels

One element necessary to reduce delays in implementation and to shorten procurement is to strengthen the capacity and skills of PMUs through intensive, sustained TA, and to prepare more realistic implementation schedules. Improved skills and retained staff with the necessary skills and resources to manage consultants and contractors are key to reducing project start-up time, implementation on time and on budget.

Capacity building resources should also be accessible to the private sector, but at a fee. Insistence on certified engineers, sociologists, financial analysts, quantity surveyors, environmentalists, etc. to be key positions in consultant scoping and feasibility studies and detail designs will (a) improve WASH implementation and (b) provide income to the education establishments to ensure they retain highly qualified staff as well as hardware and software resources.

There is an urgent need for basic water quality monitoring in all towns supported by increase in number of accredited laboratories. Capacity of regional laboratories should be strengthened in manpower, equipment and consumables, but as important is to have more laboratories in all large towns and cities to ensure better access and to improve reliability and standardization through inter-laboratory benchmarking. Skilled manpower for water treatment and quality control and, where appropriate, wastewater quality control should be available at all town and Woredas. Training and operational manuals are required for water supply laboratory facilities and for water treatment control and monitoring.

For continuous capacity building there is a need to assess the available human resources pool in each region and where favorable train the individual to lead the program or in the absence of such resources employ new staff and establish regional human resource development units.

In the short term, before professionalization of RPSs and then absorption into clustered operations, continuous trainings should be given to WASHCOs. Additionally, spare parts supply chains need to be established and maintained initially through DPs, regional governments and CSOs with rapid handover to the private sector.

It is understood that the health and education sectors have conducted a number of hygiene, sanitation and institutional WASH capacity building activities such as development of strategies and implementation guidelines to

create the enabling environment for implementation of the OWNP interventions. However, to get these strategies and guidelines into the public domain and, importantly, translated into practical training syllabi, needs significant investment in training establishments and teachers.

9.5.2 Water Utilities

Urban and proposed MVWS utilities will need continuous training and to receive technical assistance to improve utility management, administration, and operations to reach in full cost recovery status. This capacity will be enhanced by proposed clustering and formation of large (perhaps zonal) utilities with oversight from national of regional utility regulators.

As technologies and associated business models are developed, trialed and included in master planning and become established within service delivery systems, then lessons can be learnt from both success and failures and these need to be shared within and between regions so as to stimulate improvements in practice and also to avoid any duplication of effort or the repetition of less successful ways of working. For examples of good practice (GP) to be shared it is essential that the chosen examples are appropriately analyzed and understood.

9.5.3 Strengthening NWCO and RWCOs

In order to address the weak regional level coordination between the four WASH sectors, lack of integrated WASH plans, limited effort to coordinate WASH interventions implemented by civil society organizations, lack of awareness and understanding at regional levels about the OWNP concepts and principles and the differences between the broader OWNP and CWA, the NWCO and RWCOs should be given greater powers and technical capacity, either in-house or through its contracted agents.

It has been proposed that the NWCO should be strengthened in manpower and logistics so as to coordinate the planning process of CWA, CR-WASH and overall national WASH programs and produce a One WASH Program report and improved quality of data collection and reporting in the regions.

In order to have better control and knowledge of projects the following two boxes suggest reform of how all existing and new projects could be registered and monitored.

Table 9-1: Strengthening NWCO and RWCOs

Oblige all Funders and Developers[53] to jointly:
a) Notify all WASH development projects to the Regional WASH Coordination Office. b) Submit proposals to the Regional/Zonal WASH bureaus through the RWCO for scrutiny and certification to ensure that each project complies with the requirements of OWNP Phase II, as herein detailed. c) Ensure that 6-monthly Project Construction Progress Reports are issued to the RWCO, which obligation will be in addition to, or as substitute for, other Funder and Developer reporting requirements. d) Notify RWCO of the official project Handover date, the name and address and contact details of the immediate Asset Owners, the name address and contact details for the main Operator and the names addresses and contact details of all Delegated Operators and Delegated Suppliers (This may apply to both urban and MVWS schemes. For point source village schemes then the information will possibly be just the name of the WASHCO and a contact person and registration details, if applicable.)
Oblige Asset Owner or its agents to sign a Contract or Performance Agreement with Operators and oblige Operators to sign Delegation Contracts with Delegated Operators and Delegated Suppliers where:

[53] Note that CSOs currently operating in a particular region are requested to submit projects to regional level for registration and approval, but the mechanisms and capacity to ensure that this happens may not be effective

a) All such Contracts and Delegated Service Management Contracts shall include requirements for Operational Performance Reports (including Functionality, Service Coverage, Equitability, Financial Sustainability, Environmental Sustainability and other parameters as listed). b) Contracts or Performance Agreements for utilities should include standard internationally recognized KPIs (For point source village schemes then the information will likely be confined to the WASHCO registration details.) c) These contracts shall include the minimum requirements sufficient for the RWCO purposes to maintain a Regional WASH Inventory and Regional WASH Monitoring and Evaluation Data Base.
For the RWCO part, it would be necessary for the RWCO to:
a) Have the capacity to (either directly, through its agents and contractors and/or through working agreements with sister Regional WASH Bureau) to undertake to: b) Receive notifications of all WASH development projects and respond within X working days to indicate whether the project is likely to receive approval or whether further project development is required c) Scrutinize each WASH development project and issue a Certificate of Compliance with OWNP Guidelines within Y working days from initial response to the notification d) Receive 6-monthly Project Construction Progress Reports, information on Asset Owners, Operators, Delegated Operators and Delegated Suppliers and Operational Performance Reports and update both the Regional WASH Inventory and the Regional WASH Monitoring and Evaluation Data Base e) On a 6-monthly basis, upload information gathered under Item (d) to national WASH Monitoring and Evaluation data bases and the National WASH Inventory, such information to be assessed and audited by the NWCO (either directly, through its agents and contractors and/or through working agreements with sister national organizations), acting on behalf of the Signatories to the OWNP WIF and MoU
Assumptions**:**
a) The capacity of RWCOs, the NWCO, their agents and contractors and/or relevant sister regional and national organizations will be enhanced through on- and off-job training and TA, and inclusion of fair staff remuneration packages. b) The National WASH Inventory is disaggregated to regions as Regional WASH Inventories. c) The National WASH Monitoring and Evaluation Data Base is disaggregated to regions as Regional WASH Monitoring and Evaluation Data Bases. d) Where a Regional Regulator becomes established, then some of these RWCOs (and/or Regional WASH Bureaus) functions will be expected to pass to the Regulator.

9.5.4 Organize Zone Coordination Offices

Since zones are located nearer to the woredas than the regions and by virtue that they in most cases have either a regional status or are departments for the respective bureaus in the region it would be worth utilizing their capacity, human power and time for OWNP. It is therefore imperative that ZCO, ZPMUs, monitoring and capacity building units be established at that level. This will also synergize with the concept for clustered utilities based on approximate zonal size areas (see **Sub-section 9.6**).

9.5.6 Strengthening Integration, Harmonization, Alignment and Partnership

Sector Integration, Harmonization, Alignment and Partnership has been to date aimed at ensuring that the all-important health and education sectors are fully served with sustainable WASH. This goal has yet to be fully met.

There has been significant success in application of the OWNP's four core Guiding Principles (integration, alignment, harmonization, partnership) with CWA members but there is clear evidence that these now need to be expanded to include the inter-relationship with stakeholders outside of the original four OWNP signatory ministries and WASH actors.

There is a need for OWNP SWAp to prove itself that it is systematic, effective and productive program that is translating its guiding principles and programs effectively on the ground. One of the attractions for more donors to join full force in the future will be based on the success stories of the OWNP in all aspects of the planned activities; the full translation of the OWNP principles on the ground effectively and the learning made every year. Currently, the CWA partner numbers is not expanding as much as desired. Partners such as Finland government (COWASH) and potential partners such as USAID, and CWA partners such as UNICEF, AfDB etc. are running a parallel WASH program indicating that OWNP CWA must deliver to attract more partners.

9.5.7 Maximizing availability and efficient use of human and financial resources

It is paramount that available permanent and contractual sector staff and consultants are fully exploited through the institutionalizing of accountability and encouraging innovation. The program staff should understand that such social services are cross cutting and have to learn to involve as much stakeholders (the common and the uncommon) for one common end which is ensuring sustainable and resilient WASH services.

Release and/or utilization of funds at regional and federal/national levels has been slow. A national framework for fund raising purposes has been suggested whereby regions could do their own planning and implementation based on regional proclamations, directives and implementation modalities.

9.5.8 Develop Efficient Program Communication Strategy

The NWCO should develop Program Communication Strategy to create sustainable buy-in of the wide range of stakeholders and partners towards the achievement of the OWNP objectives. It should also ensure appropriate publicity and dissemination of policies, programs, strategies, water legislation, guidelines, technical standards, regulations, orders, etc.

So far, the OWNP vision, mission and guiding principles are not well known to people at all levels. Beneficiaries should be aware of the Program and support it, but equally high-level government officials should also know about the Program, the effort being made, the financial implication put forward and the outcome. It is imperative that communication at scale to popularize the program and harnessing much more donors be one of the focus areas in OWNP Phase II.

To expand public awareness, knowledge of and commitment to the Program, the Program should move beyond its institutional framework and appeal to the public as potential beneficiaries. This can be achieved through support to a multilevel multimedia communication strategy that will include:

- Formative research, “customer journeys”, communication plans, a “One WASH” logo, mascot and slogan, etc.
- Topical spots aired on regional radio stations
- Short programs with health and hygiene messages on ETV and educational broadcasting
- Posters, billboards, banners, pamphlets, stickers and flyers commemorating special events
- WASH educational kit for use in schools
- Use of Goodwill Ambassador(s) and national celebrities to create awareness and spread relevant messages
- Profiling the Program at World Water Day, Earth Day, through photo and art contests and other events in collaboration with the WASH Media Forum.

9.5.9 Involve the Private Sectors in WASH

Lack of hand pump spare parts makes it difficult for communities and artisans to access spare parts within a reasonable distance and at an affordable price. MoWIE has made an assessment of supply chains in 2010.[54] This study showed that supply chains for hand pumps and spare parts, largely driven by market forces, were still in their

[54] Region Specific Supply Chains for Hand pumps and Spare Parts in Ethiopia, MoWIE, May 2010.

infant stage in Ethiopia. The study recommended that procurement of hand pumps and spare parts be combined and private suppliers be motivated to open and operate sub-regional outlets.

To promote economies of scale, sanitation and hand pump supply chains can be combined and piloted using trained women and youth entrepreneurs that, if successful, could be considered for scaling up. To make supply chains more commercially viable products relating to a healthy household environment like household water treatment and safe storage could also be combined with hand pump spare parts and sanitary products.

The relationships between microfinance institutions and the water and sanitation sector needs to be developed in order to jointly build sustainable access to affordable credit. There is the potential for the poor to better meet their water and sanitation needs through affordable micro-finance loans. However, the business case would have to be developed through case studies and trials to establish affordability for customers and profit for entrepreneurs and suppliers. At the same time, supply chain assessment can be done by directly involving the various actor and stakeholders of the WASH sector.

9.5.10 Strengthen Community Involvement/Participation and Empowerment

Community participation is essential in project planning, in operation oversight roles for both urban and rural water supply, sanitation and hygiene awareness, as well as promotion of services and willingness to pay. Communities, particularly low-income communities, should ideally have a sense of "symbolic ownership" (but not physical ownership of assets) and must have a role to play from inception to completion of projects and later in operation and management.

In the urban and MVWS setting, community involvement with service delivery may be as oversight role (Water User Groups, etc.) or as delegated operators of ring-fenced supply areas (single kiosk, street, low income area, etc.).

In the single village low tech system, it is anticipated that the WASHCO management system will prevail. It is stated[55] that community participation in project planning and construction will facilitate the "user community engagement in the post-implementation management of the WASH systems". It is then stated that (limited) external support will be required until "the community has developed a capacity to do these activities itself" and that "it is obvious that a rural community cannot take care of the overall management without the support of the local governments, private actors and NGOs. These external supporters should establish an enabling environment for post-implementation management activities."

9.5.11. Sharing of good/best practice

As technologies and associated business models are developed, trialed and included in master planning and become established in-service delivery systems, then lessons need to be learnt from both success and failures and these need to be shared within and between regions so as to stimulate improvements in practice and also to avoid any duplication of effort or the repetition of less successful ways of working.

A recommended stepwise methodology on sharing of good practice is presented in the IUSHSAP as an outline for further development by the national WASH Steering Committee and regional fora including Regional WASH Coordination Offices and Regional WASH sector bureaus.

For examples of good practice (GP) to be shared it is essential that the chosen examples are appropriately analyzed and understood. For others to be able to replicate these examples they will need to appreciate fully what was achieved, how it was achieved, what the critical factors were that lead to success, what were the drivers for success, etc. It should be noted however that the approach is proposed as an efficient method for sharing "one to many" i.e. of sharing and disseminating a single example with a wide group of interested parties. Where "one to one" sharing is required alternative approaches may be more efficient and more affective.

[55] Comparison of community managed projects and conventional approaches in rural water supply (2016)

The task of achieving total WASH services in general and sanitation in particular requires active research and injection of innovative ideas to cope with emerging issues. This requires close collaboration between municipalities, utilities, as well as Regional WASH Coordination Offices and Regional WASH sector Bureaus, with universities and research institutes in the country. These proposed meetings on sharing of good practice offer such fora for this collaboration to flourish.

9.6 Clustering

- Voluntary clustering for economy of scale, improved O&M and use of international KPIs for urban large and small towns, satellite villages and MWVS schemes; ahead of formal sector reform
- Development of performance agreements, internationally recognised KPIs and inclusion of refugee areas WASH under clustered utility operations

The question has been asked[56] as to whether it is "realistic to monitor and regulate the existing large number of schemes … 280,000 at present, with an additional 50,000 per year anticipated"? To this remark may added that there are over 1,000 urban areas, over 800 woredas, and large number of villages and pastoral communities, in 9 autonomous regions and two city administrations divided into over 70 zones.

In order to monitor and regulate WASH operations (and implementation) in Ethiopia, it has become clear that the water sector will need to undergo some reorganization. GTPII approaches this through (a) establishment of independent water supply and wastewater service regulatory agency (Goal 4.2), (b) ensure good governance in rural water supply (Objective 2), and (c) increase the involvement of private sector (Goal 4.4). Such changes will need to allow for increased catchment protection (Goal 3.5) and be able to conserve water through reduction in NRW (Goal 3.1).

The primary "WASH Sector Reform" principles that may be applicable in the Ethiopia situation and identified so far include, but are not limited to, the list in **Table 9.2** below. Some sort of new "Implementation and Operational Modality" is envisaged that is guided by this list and which will (a) address the bottlenecks identified under Phase I review, (b) take on board GTP and SDG goals and (c) allow as far as possible for new strategies, guidelines and directives as they are adopted/issued.

Table 9-2: WASH Sector reform concepts

	Table 2: WASH Sector Reform Principles	Allowed by	Ethiopia experience
1	**Regional regulators** (reporting to a federal oversight body)	GTPII Goal 4.2	South-south dialogue started
2	**Economy of scale** through **clustering** of large, medium and small towns and MVWS	Driven by directives on financial autonomy	Informal sharing is being done
3	Inclusion of **networked villages** under above two items	Increasing complexity and lack of capacity at WASHCOs	See for example Siraro Water Supply Service Enterprise, also 8 towns of the ONEWASH Plus
4	**Sustainability Master Planning** and Feasibility Studies	Fully articulated in the IUSHS&SAP	Closest to this might be the 8 towns under One WASH Plus
5	**Resilient systems**, better able to cope with emergencies and climate change	Current need due to increasingly regular occurrences	High cost of WASH Cluster Emergency activities and lack of funding

[56]Dr Geremew

6	Two-way (oversight and reporting) mechanism through KPIs (**key performance indicators**)	The "fundamentals" of service provision	World Bank is understood to be supporting large utilities and Coffey are developing more general KPIs and around 18 supplementary indicators that will be applicable across rural as well as urban areas
7	**Contractual obligations** at all levels (for instance; concession/ performance/ service management contract for a publicly owned ring-fenced utility operating water and sanitation services in a large city, delegated SMC, kiosk operators agreement, SMEs, etc.	Another "fundamental" of sustainable service delivery	Perhaps limited examples in Ethiopia, but written and verbal "contracts" do exist as, for example; kiosk operators agreement, women's group operating agreement for a public toilet, community group (WASHCO) agreements to operate a village water system, etc.
8	**Delegation** of services and support functions to community organisations and private enterprise	GTPII Goal 4.4	Already being done as part of job creation
9	Clarity on **asset ownership,** as well as ownership of mandated public and private operators and delegated operators and contractors	Ownership, particularly for community based project may be confused and lead to disagreements as the schemes grow and need to be formalised	Believed to be a common problem in Ethiopia as well as elsewhere in Africa
10	**Competition for funding** based on "bankable projects", while maintaining:	Need to have an increasing inventory of successful and sustainable projects that can catalyse major investment	This is the basis for WRDF
11	**Equitable distribution** of funding monitored by regional bureaus, but not at the expense of undermining competition	Perhaps a cornerstone of Ethiopian "ethos"	Procedures for equitable distribution within Regions and between Regions are in place
12	**Competition** between utilities as professionalization incentive	This is starting through "sharing of good practice" and trialling KPIs at Utility Association levels	There are many examples through all sectors (*obviously sport*) where competition improves performance and the pursuit of excellence

Water and sanitation sector reform is an essential component of creating an enabling environment for both urban WASH and for MVWS systems. However, this will necessarily involve an extended change process (beyond 2020) although, as described, there are actions that can be continued or initiated in the short term, such as clustering and delegated management.

Economy of scale means that unit costs for WASH infrastructure and operations will increase significantly as the town size decreases; the benefits to be gained from clustering may be demonstrated through financial analysis of various cluster options.

9.7 Advocacy

9.7.1 Overview

- BCC for water security, sanitation and hygiene; but also sanitation awareness and responsible engagement at all levels (government, utilities, DPs, CSOs, private sector).
- Community engagement with safe rural water and hygienic sanitation practice and learning from refugee areas water safety and sanitation procedures to inform overall rural and urban WASH practices.
- Introduction of sanitation micro-plans[57].
- Popularizing OWNP is one aspect of advocacy need. It is only with systematic reach out mechanism that SWAp can be attractive to donors, bilateral and the government itself as results speak louder than mere talk.
- The other advocacy need to mobilize all concerned including beneficiaries for a sustainable change is by designing a communication system which is based on facts. For example, the fact that improved sanitation and hygiene which stands at only 28%; the low quality of water supply; lack of resilient water source and technology; the non-functionality rates of water systems, etc. can be used to advocate for more support or action. In addition, for effective advocacy the sector must document sector learning and knowledge capacity for two purposes:1) stakeholders and donors wants to know what ever is happening in OWNP and 2) learning motivates more learning, enhance knowledge and innovation, help managers focus on gaps and needs.
- The facts warrant that continuous advocacy and awareness creation has to be major OWNP efforts not only to communities to those who are affected but also political leaders and managers.

9.7.2 BCC

Behavior Change Communication (BCC) can only be effective if it is built on facts as indicated in the advocacy package. Conducting formative research will also indicate social norms, behavior barriers, motivators and also existing approximate behaviors that people practice although not perfect.

In Phase II communication for behavior change and practice should not continue as “business as usual”. Communities have to be organized, a behavior change communication should be designed based on social norms, approximate cultural practices etc, information and communication efforts must be systematized and involve all means and ways to communicate for a sustainable change. This will involve: Multi-level advocacy, strengthened household outreach, enhancing community-based approaches for change, enhancing media support, increased availability and affordability of hygiene and sanitation products through private commercial and NGO sector initiatives, school hygiene and sanitation, demonstration latrines and hand washing stations

[57] Currently being developed under UNICEF leadership but not yet published

9.7.3 CLTSH

Furthermore, it is understood that the current CLTS approach (ODF and latrine construction) is in many instances not practical or affordable in the pastoralist physical and economic environment (lack of construction materials such as timber and clay, predominance of animal feces around dwellings, loose soil, grazing patterns, etc.) and that alternatives need to be researched (for instance, collection and burial of faeces in arable land or as part of preparation conservation tree planting) or using it for biogas generation so that clean fuel is introduced and the digested waste can be used for soil conditioning.

9.7.4 Sanitation marketing

There is an ongoing effort to increase access and utilization of improved sanitation facilities, to reduce OD and to improve safe handling of water through health extension program and engagement of private sectors.

Cognizant to limitation of basic unimproved latrines, the FMOH continues to encourage demand creation using CLTSH/SLTS tools, to developed sanitation marketing strategy to promote access to improved sanitation technology options and services; and SBCC strategy to sustain demand for improved sanitation and hygiene services.

9.7.5 Promotion of Service Delivery

In parallel with top-down advocacy and promotion of "self-help" activities and creating a demand for services (the bottom-up approach), it is vital that the municipalities and utilities themselves utilize the outcomes from sustainability master planning, principally the formative research aspects, to overcome any blocks to take up of services by customers (domestic, commercial, institutional) and to actively promote and "sell" their "products" (sanitation and water supply services).

The methods to be used to sell the services could be similar to methods used by commercial service providers, such as mobile phone network providers. Exactly how this is done shall be laid out in a Communication Plan with its associated creative tools and promotional materials. The motivation for municipalities and utilities, as well as their delegated operators and suppliers, to promote and sell their services will come partly from conditions included in proposed Service Management Contracts (SMC) and Delegated Service Management Contracts (DSMC), see **Sub-section 10.5.6**. In the Ethiopian context, it is also expected that municipal and utility heads will respond positively to top-down advocacy.

9.7.6 Institutional WASH role in advocacy

School and health care WASH facilities should be exemplary, certainly ensuring adequate water and soap and in terms of maintenance and cleanliness (if not yet in terms of standards of construction or user/unit ratios), since this will be the main means by which GoE can demonstrate the importance of sanitation and hygiene to the public, complementary to the HEP and UHEP.

Hygiene and sanitation education should continue to be included as a major part of the school curriculum, but it will fall on "deaf ears" if there are only poor facilities provided to school students and health center patients. Wherever possible, WASH facilities should be inclusive of needs of users living with physical disabilities, special needs of school girls and female teachers (MHM) – see "Minimum WASH Packages" described in **Sub-section 4.6**.

9.8 Emergency WASH and CR-WASH[58]

- Phased replacement of Emergency WASH with CR-WASH moving towards Emergency WASH being reserved for unpredictable occurrences, not regular drought and flood cycles.
- Development of Emergency, Preparedness, Response and Recovery (EPRR) procedures.

[58] Resilient and Sustainable WASH Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia, previously termed "CR-WASH"

9.8.1 Rural and urban WASH Resilience

Rural WASH presents particular challenges from water stress, related to population and livestock increases, deforestation, climate change, over-pumping of wells, high non-functionality rates etc. Industrial scale irrigation may also significantly impact on traditional village and pastoral water practices. Where there are towns and cities nearby, the demand for water for domestic, commercial and industrial uses may also compete/impact surrounding village water supplies (see GTPII Goal 3.5 related to catchment protection).

Low reliability of shallow wells is currently being tackled through "networked villages" whereby several villages and livestock watering points are served from a single deep borehole. Where sustainable recharge is insufficient then consideration is being given to very deep boreholes to tap geological water reserves. One of the main challenges is affordability, which signifies the need for sustainability master planning and feasibility studies, or viable business models, as described in **Sub-section 9.9**.

Electricity production through diesel generators to power down-hole submersible pumps is expensive and use of alternatives (such as solar power and hand powered deep pumps) need to be expanded for rural areas, particularly where hydro-power (or large scale solar and wind generated) grid electricity is out of reach.

SDG 6.4 calls for a substantial increase in water-use efficiency across all sectors, to ensure that water withdrawals are sustainable in order to substantially reduce the number of people suffering from water scarcity. Primarily, however SDG may not be accomplished with the present level of service or use of point source supply but through the use of multi village water supply and through intensified water shed management, enhancing ground water recharge potentials, use of adequate water storage to ensure water availability at all times. In the urban context this means 100% metering, equitable but sustainable tariffs, economy of scale, low NRW, supportive management, etc.

All these measures would improve both WASH sustainability and WASH resilience.

9.8.2 Emergency WASH

Emergency is an unfortunate happening in a country or society manifested in different ways. The most common emergencies are flood, fire, draught, etc. In Ethiopia common emergencies are created during drought and flood. "Droughts" in Ethiopia have become a more frequent than used to be in the past. This creates water shortages usually requiring water trucking which is estimated to be 35 times more costly, per year, than annualized capital and O&M costs of fixed water systems, often involving very deep boreholes. Details of what preparation needed is indicated under emergency component above.

During an emergency, people in the affected areas may have to move to a different presumably safe location. In this instance the most affected are children, women, and the elderly. The most important need of this affected population in such instances is food, water, sanitation and hygiene services and shelter which are difficult to have in place unless prior preparedness is made.

According to UNICEF Preparedness for emergencies include

- Planning for emergency staff deployment
- Pre-positioning of strategic supplies
- Preparation of pre-approved contracts with local implementation partners (such as water trucking companies) and suppliers
- Advance coordination arrangements with government partners and other stakeholders through the cluster approach.

Ethiopia is in a better position in tackling emergencies due mainly of its infrastructure and mix of professionals that can be deployed for emergencies at any level. However, to be better prepared:

- Sector staff should have appropriate basic training
- A manual for WASH emergency which will include application of:
    - Chlorination, storage and distribution of safe water
    - Construction of safe latrine, hand Washing station, shower services and operation and management arrangements
    - Solid waste collection and disposal facilities

These demand a budget set aside for emergencies with the necessary financial procedures to follow during emergencies.

9.8.3 Climate screening for WASH

To improve year-round water security and resilience of schemes to drought, the Program will promote and support better understanding of available water resources and climate risk and improved design and siting of schemes. This will include (but see also **Sub-section 9.2**):

- developing linkages between WASH and water resources assessment and monitoring
- mapping and understanding of groundwater resources
- development and use of simple climate risk screening and assessment tools – including catchment screening to assess the balance between available supply and projected demand
- development and training on sizing and siting of rural water points to reduce vulnerability to dry seasons and drought periods
- Meetings held with relevant stakeholders in agricultural and environmental departments to ensure coordination with natural resource management (NRM) interventions and watershed committees in vulnerable areas.

9.9 Sustainability master planning and feasibility studies

- Sustainable development studies and designs; affordability and appropriate levels of water and sanitation services

9.9.1 Introduction

This **Sub-section 9.9** gives guidance on the general principles related to master planning and feasibility studies; it does not specifically state who is responsible for each component related to master planning. However, it is generally expected that the master planning should be carried out by individual or groups of municipalities and utilities with assistance from the Regional Water Bureau. These organizations will use their own resources and will further engage support from national and international Technical Assistance, Universities and Technical Colleges.

“Minimum package” plans need to be developed for applicant individual and grouped/clustered municipalities and utilities based on “readiness criteria” (**Section 5**). Master planning and feasibility studies are required to prepare such minimum packages that are financially and environmentally sustainable and that can demonstrate a business case or “bankable project” worthy of investment.

“Minimum package” has so far been conceived as applying to individual towns, with smaller towns generally being allocated lower levels of service than larger ones in the planning process. However, this has the risk of leaving smaller towns at the bottom of the ladder for some considerable time, with serious impact on the most vulnerable, including children.

A different approach should be taken that encourages small and large towns to group and eventually formally cluster (see **Sub-section 9.6**) to share services under reformed management structures (for instance, WASH under a utility serving several towns and SWM services under a delegated operator). Under these circumstances,

equitable service delivery can be assured across towns of different sizes. As important, environmental protection measures can be applied throughout the service delivery areas that include both small and large towns.

Such clustering is essential in order to meet the GTPII Goal 4.2 to establish a national water utility regulator for urban areas and MVWS schemes, since it will be impossible to regulate the currently over 1,000 small, medium and large urban conurbations.

Because of economy of scale, institutional review and other factors, the sustainability master planning should be able to identify a Minimum WASH Package (MWP) that could be broadly defined as: "*The least cost option that provides equitable financially and environmentally sustainable water and sanitation service delivery for both small and large towns*".

Various elements that make up comprehensive master plans capable of yielding up "bankable MWP" projects are included below; socio-economic analysis (**9.9.2**), cross-cutting factors (**9.9.3**), appropriate and affordable technology (**9.9.4**), economies of scale, sharing and delegated management (**9.9.5**), formative research (**9.9.6)**, financial analysis (**9.9.7**), tariff structures and phasing (**9.9.8**), technical assistance (**9.9.9)** and business models **(9.9.10).**

Not included in this list, but an essential part of more detailed feasibility and design studies that may follow master planning, are environmental and social impact assessments, ESIAs, that may be required before a project starts. However, it is important to be aware at master planning stage of any potential issues that might arise at ESIA stage:

For instance, FSM primary and secondary treatment systems including DEWWATS (decentralized waste water treatment systems) need to ensure that groundwater sources are not affected, that sludge and liquid wastes are treated sufficiently for safe re-use, and that communities, as well as politicians and technical managers, are sufficiently sensitized to the low impact of well-designed and operated systems located close to dwellings: Such sensitization (or advocacy) may take many months and may require visits to successful "demonstration sites". (See **Annex 7** as one Ethiopia example but also many models being developed across Africa.)

9.9.2 Socio-economic analysis

The basis for any water, Fecal sanitation and solid waste master plan is knowledge about the customers to be served by municipal and utility operators, both to understand their needs and aspirations and also to determine what is affordable. This includes socio-economic status of the various groups of customers, their spatial distribution and population trends. Such trends include in- and out-migration, natural growth, densification, planned or assumed expansion of service areas, etc.

9.9.3 Cross-cutting factors

Sustainability master planning should take full account of all cross-cutting factors which include:

Resilience to natural and manmade disasters (*see also* ***Sub-sections 9.8):***

- This should involve increasing design factors, such as those related to surface raw water storage, groundwater reserves and treated water storage
- It should also involve establishing and supporting the supply chain for in-house water filtration units to allow for contaminated mains water during water rationing and to mitigate for residents using alternative contaminated surface and shallow groundwater sources of water
- Design of sanitation systems should be based on lowest predicted per capita water availability during drought or due to water being required by disasters in the locality; at least 50 l/p/d is required at household level for full flush systems connected to centralized sewage treatment systems.[59]
- Hence centralized sewerage systems should only be considered where water supply of around 100 l/p/d and 150% of industrial and commercial demand (to allow for temporal and spatial variations related to consumer

[59] However, to date, average per capita urban consumptions above 30 l/p/d are rarely reached, even under normal climatic conditions and even in large developed cities

types and for NRW) can be assured, including drought years, for all consumers connected to the sewerage system

- As a result, low water usage sanitation systems shall be considered as an option in all master planning: Such systems include minimum cost, but environmentally sustainable, FSM systems based on pit latrines, septic tanks and decentralized waste water treatment systems DEWWATS (**Sub-section 9.3**)

Discretionary tariffs:

- In areas where financially sustainable water and sanitation tariffs will be introduced, discretionary tariffs should be considered
- This may perhaps best be implemented by delegated operators who are aware of hardship cases and can register these households as eligible for subsidized charges
- If larger scale private or community based delegated water, sanitation and SWM service providers, serving populations of say 10,000 or more households, are planned under institutional changes (and where these have been demonstrated to be financially and environmentally sustainable through master planning and feasibility studies) then such operators should also be close enough to the communities to evaluate and manage discretionary tariffs

Equitable service delivery:

- It is obviously not possible for all urban customers to receive the same level of water and sanitation services since the variations in standards of in-house facilities, and what each customer can afford, between low and high-income residents may be vastly different. However, the concept of "equitable service delivery" should be included within any specific service level category
- For instance, all water kiosks shall be open for the same length of time each day and have sufficient pressure to meet consumer demand. Also, customers with a household meter at the perimeter of a water supply zone should have equal water availability to customers at lower elevations and closer to water sources
- Appropriate FSM services shall be available to all customers in a given service area at the same unit charge: For instance, in predominantly pit latrine areas low cost technology with manual operation of equipment and donkey cart haulage to transfer stations should perhaps be considered in order to bring service levels in line with customer affordability levels

Gender and disadvantaged:

- The sustainability master planning should explore and evaluate low cost options for sanitation facilities located within private, public, communal, commercial, educational, health, government and other institutional buildings to cater for gender and vulnerability requirements
- Such sanitation facilities should have child, gender and differently abled features, but importantly they should take into account the whole sanitation chain in terms of appropriate technology and cost recovery to ensure affordability for these customer categories
- Women, youth and differently abled persons (the CGD category) should be involved in enterprises that will deal with sanitation services, partly since these are vulnerable groups often with poor sanitation services themselves
- The principle of job creation should not conflict with the principles of efficiency and cost recovery; as such, enterprises should be required to agree to and sign delegated service management contracts (see **Sub-section 10.5** for more details) to ensure equitable and sufficient financially and environmentally sustainable service delivery
- The involvement of women, youth and differently abled persons in environmental protection activities should also be considered to fill the "gap" between household responsibility for in-house cleanliness and the regular municipal and utility service provisions; for instance, open dumping of rubbish
- In compliance with the GTPII, women membership of WASHCOs shall be increased to 50% or more and training of women artisans, higher and medium professionals shall be increased to 25% or more

9.9.5 Economies of scale, sharing and delegation

Consideration of informal sharing (short term) and formal "clustering" shall be a core institutional component of all master plans, as discussed in **Sub-section 9.6**. This will also be a likely prerequisite for introduction of utility regulators (GTPII). This will need the full voluntary cooperation of all participating towns which see the service delivery benefits and the greater possibility of "bankable MWP[60] projects" to attract grant money and, importantly, that have the potential to lead to healthy financial operations able eventually to attract loan money.

Delegation of ring-fenced sections of service delivery and specialist activities to private and community-based organization under strict delegated service management contracts (DSMCs) shall be fully integrated in the master planning proposals.

9.9.6 Formative Research

Urban water and sanitation is principally about service delivery: An enabling environment is needed to ensure delivery of sustainable services but also to ensure that customers use and pay for the services once provided. However, there are likely to be "road-blocks" at both these levels which could result, for instance, in slow implementation of management and operational systems on the one hand and slow uptake of services by customers on the other hand. The result may be wasted investment or low "return" on the investments (in terms of consumer benefit).

As discussed under the advocacy (**Sub-section 9.7)**, what is known as Formative Research is required to identify, at an early stage in master planning, blocks to the implementation of financially and environmentally sustainable services and blocks to customer demand for and uptake of those services.

The methodologies used in Formative Research to bring about behavior change (that is, including high level change within municipalities and service providers as much as consumer change) include "Tools" and "Communication Plans" that should be formulated as part of sustainability master planning, detailed feasibility study and design stages.

Essentially, Formative Research builds on Socio-economic Analysis (**9.9.2**) and Appropriate and Affordable Technology (**9.9.4**), taking into account Cross-cutting Factors (**9.9.3**) and ideally linked in an iterative or "feed-back loop" with Financial Analysis (**9.9.7)** to arrive at an Information, Education and Communication (IEC) strategy. The communication plans within the IEC roll out may typically be formulated to address four, or more, time stages; pre-construction, during construction, post-construction and long-term repetition of behavior change messages.

9.9.7 Financial analysis

Financial analysis, which should be carried out as the key part of master planning and feasibility studies, should demonstrate that a project is "bankable" in terms of financial sustainability, such that it will attract funding from donors and lending agencies. The analysis may, as above, involve an "iterative process" involving technical development (**9.9.3**), economies of scale (**9.9.5**), formative research (**9.9.6**) and tariff structures and phasing (**9.9.8**):

- For instance, a particular sanitation technology or service delivery level may be desired, and the corresponding capital and operating costs will be entered into a financial model. However, the result of running the model may show that the tariff levels needed to cover the costs (O&M and loan repayment, if any, and depreciation/ replacement cost), in the absence of long-term reliable cross-subsidy or outside subsidy, will be beyond the customer ability to pay (as determined from socio-economic study (**9.9.2**).
- The iterative process therefore might involve re-visiting technologies that are simpler and/or more labour intensive and/or it might involve revisiting formative research and tariff structures in order to explore whether the higher income customers could pay more in order to subsidize services to lower income customers. Alternatively, funding agencies might be approached to negotiate softer loan terms.

[60] Minimum WASH Package (MWP) has been suggested under the IUSHSAP to be: *The least cost option that provides equitable financially and environmentally sustainable sanitation and water service delivery for both small and large towns*

- In addition, the actual figures on income and expenditure in many situations may not be accurately known: In these cases, it is essential to run sensitivity analyses on the financial model to minimize project risk.

Consideration of economies of scale (**9.9.5**) suggests that sharing, more formal clustering and delegated management may be beneficial, since they should lead to more cost-effective service delivery and easier regulation and monitoring. This will in turn increase customer willingness to pay and to use the service[61], thus improving the overall financial sustainability of service delivery and increasing investor confidence, whether on a grant or loan basis.

However, such proposals need to be clearly optimized through financial analysis: For instance, including a more distant town in a cluster where roads and communication channels are poor might in fact increase, not decrease, overall costs.

9.9.8 Tariff structures and phasing

As discussed above under financial analysis, business planning involves "balancing the books" whereby the levels of service provided and the degree of technical sophistication are matched by income generated from sales. In practice, even after introduction of all possible efficiency measures, full cost recovery for sanitation services may be difficult to achieve, particularly if capital costs are included: Therefore, the IUSHSAP proposes the inclusion of subsidies and cross-subsidies as part of the business planning and for inclusion in the financial modelling.

Master planning should aim for full cost recovery for water supply including capital and depreciation costs as well as generation of a surplus to subsidize sanitation. Further, sanitation subsidies from municipal rates, electricity tariffs, etc. should be discussed and agreed at municipal and regional levels. Where possible and acceptable to the local and national economy, a surplus might be generated from industrial and commercial tariffs to subsidize downstream sanitation services.

Of course, willingness to pay will likely only be achieved following construction or rehabilitation of systems to ensure adequate water sources, storage and distribution and implementation of IEC packages and advocacy measures.

The master planning should allow for sustainable charges for vacuum trucks within business models that maximize upstream labour intensive systems and economies of scale. For instance, labour intensive operation of small mechanical (**Annex 7**) and manual desludging pumps and donkey cart transport of sealed containers to local transfer/ primary treatment stations will allow the limited number of expensive-to-run vacuum trucks to concentrate on continuous full tank runs from transfer stations to drying beds in a well-managed highly efficient operation.

It is necessary for the master planning to particularly consider commercial and industrial tariffs related to water supply, solid waste management (SWM), hazardous waste management (HWM) and liquid waste management (LWM). Tariffs, charges and penalties shall be strictly on a "polluter pays" principle aimed at full operational and capital cost recovery as well as to create a surplus to fund a local task force (under a mayor's office for instance) or to help fund the EPA in the Ministry of Environment, Forestry and Climate Change (MoEFC).

9.9.9 Technical assistance

It is expected that TA will be needed to assist with sustainability master planning and feasibility studies and to support funding bids. The TA should be focused at individual and grouped/clustered municipality and utility level in order to concentrate on getting coherent master plans together that will generate "bankable MWP projects" capable of attracting funding. The TA involvement at this level will include on-the-job capacity building and it is necessary that counterpart staff are assigned to work with any TA consultants and that their individual progress is monitored, assessed and reported.

[61] Terminology used elsewhere, for instance JICA, discusses moving from a "vicious cycle" (poor service > low willingness to pay > no income to improve service > poor service) to a "virtuous cycle" (improved service level > willingness to pay > increased income > increased investment in services > improved service levels)

The other area for immediate focused TA, including on-the-job capacity building, is expected to be at the level of Regional Water Bureau which will be expected to support the master planning and funding bids within their region.

It is also expected that extended term TA involvement will be required for research and development (**Sub-section 9.3)** and to bring about institutional changes (**Sub-section 9.6**).

TA will be engaged and managed according to the following modalities, which differ from the usual project-based approach where TA is recruited and managed by a single client or project unit:

1. By or through collaborating ministries and bureaus
2. Directly by an associated or collaborating partner organization, which can be a bilateral or multilateral aid agency, service provider, CSO, etc.
3. By contributors to the OWNP CWA

The pursuit of highly ambitious targets, the relative size and complexity of the OWNP, introduction of new roles and responsibilities at all levels, the existence of capacity gaps in implementation partners at all levels, the need for a robust regulatory and monitoring framework and the promotion of new contracting modalities, technologies and construction methods, make the provision of relevant and timely Technical Assistance (TA), as well as other training and capacity building measures, an important element in effective implementation, especially during the remaining OWNP Phase II period but also beyond this period.

9.9.10 Business models

Achieving financial and environmental sustainability in the Ethiopian context requires that water services, but also sanitation services (for Fecal solids and liquids, for commercial and industrial liquid and solid wastes, for medical wastes and for domestic solid wastes) are treated as much as a business as selling mobile telephones, for instance.

Even though a sanitation "business" may rely on subsidies (for instance, from municipal rates) and cross-subsidies (for instance, from surplus water revenue, either at town level or from a national Sanitation Levy Fund[62]), the financial analyses carried out for sustainability master planning (**9.9.7**) still need to show where the money will come from to pay all O&M costs and all capital charges.

Demonstration projects need to be established and to be of sufficient scale to accurately model economics as much as technology. The demonstration models need to be monitored over an extended period and to include all information on customers, income and expenditure, health and safety, labour issues, environmental compliance, etc.

9.10 Urban planning

- Enforcement of planning and shift towards watershed management and catchment protection.
- This is a multi-sector activity outside of the OWNP but essential to create an enabling environment for sustainable WASH – in terms of water resource development and environmental and health protection, particularly for the urban poor, peri-urban and satellite village local "downstream" or within pollution discharge zones.

Multi-sector integration

It is clear that there needs to be a stronger coordination and integration amongst the various sectors in order to create a common mechanism to enforce laws and acts related to urban development and provision of WASH services. As the areas of Urban Water, Sanitation and Hygiene involve different sectors there is a likelihood of overlap in the course of regulatory enforcement. Avoiding duplication and overlaps will not only ensure better use of public resources but will help to minimize the burden on regulated subjects and maximize effectiveness.

[62] Zambia applies a SLF of 2% on all water sales to help fund sanitation services while Uganda has proposed a 5% SLF

The enforcement and application of such provisions not only improves the immediate environment but also human health and wellbeing, thereby enhancing growth and development.

Planning control

Water and sanitation systems that meet customer needs have to be based on an enforced physical plan[63].

Although planning management structures may be in place (for instance, Mayor-headed committee, a Construction Unit issuing permits to build, legal powers through Land Management Dept., kebele groups monitoring development) risks may be high due to weak coordination, limited finance and vested interests. As a result, urban development may be informal and not where it is meant to be, making provision of sustainable services impossible or extremely difficult.

Physical planning that takes into account provision of services and environmental protection should be strictly enforced. Where development has taken place in contravention of planning and environmental regulations, such development may be demolished or charged in such a way as to ensure compliance.

Environmental Compliance

Measurement and verification to ensure that standards are strictly followed at sites during construction, as provided by the rules and regulations, are key elements towards safeguarding health and safety, protecting the environment, etc. All actors shall develop and apply mechanisms that help achieve the best possible outcomes.

In this case, combining broad compliance promotion with well targeted controls and the application of deterrent sanctions for various violations will ensure attainment of optimal results. Transparency and compliance shall be promoted through the use of appropriate instruments such as guidance, toolkits and checklists.

Regulatory enforcement and inspections should be evidence-based and measurement-based (deciding what to inspect grounded on data and evidence) and results shall be evaluated regularly. Although monitoring of environmental compliance with regard to sanitation facilities by the Ministry of Forestry and Environment is at an infant stage, it is expected that its scope and effectiveness will be enhanced: As an example, this Ministry is expanding its laboratories and other facilities to undertake their tasks.

Hazardous Waste Management

Solid and liquid hazardous wastes will primarily be generated by industry (with enormous variations) and health institutions, although e-wastes may come from all sources.

All hazardous solid and liquid wastes which will include heavy metals, hazardous health care wastes generated must receive treatment at the production facilities prior to disposal in a manner approved by the municipal authority. Multi-sector cooperation to ensure long-term sustainable water resources, recycling and re-use, pollution control, etc.

Both MoH (through the H&EH strategy and IUSHS&SAP) and MoWIE (through the Urban Wastewater Management Strategy, Feb 2015) consider industrial/ commercial wastes, health sector wastes, domestic solid wastes, agriculture chemicals and integrated WRM to be a concern for health and "water safety planning". These will all need to be taken into account both through high level "top-down" planning and policy level and through "bottom-up" sustainability master planning and feasibility studies (**Sub-section 9.9**).

9.12 Sector budgets

- Ring-fenced sector CAPEX and OPEX budgets for WASH in schools and health facilities;

[63] Planning has to be based on knowledge of population increase, spatial development, expected service levels for high/low income areas, industry, commerce, institutional, etc. It should also align with Integrated Watershed Management Plans, ref. Water and Land Resource Centre in Addis Ababa University

- Water supply and sanitation services to/from property boundary increasingly becoming obligation of utility or WASHCO.

See also **Sub-sections 4.7, 7.4, 9.7.6**, etc.

9.14 Monitoring and Evaluation

9.14. Strengthen Monitoring and Evaluation for WASH

- Updated regional WASH inventories of installed systems, planned systems and management types.
- RWCOs strengthened to handle data storage and dissemination.
- Education and Health MIS improved.
- Increasing use of data for M&E use, asset management and investment planning. Development of "crowd source"[64] report card system.

See also **Section 15.**

The program should have a strong monitoring and evaluation framework, which includes high-level review meetings, external reviews, and independent sustainability checks, among other measures. This plays a key role in ensuring effective project implementation by identifying bottlenecks in a timely manner and defining adequate measures to address challenges that will impact the progress and sustainability of the project.

A comprehensive WASH sector monitoring framework supported by an information system should be established. MIS enhancements to cover output reporting requirements should be given emphasis in phase 2 to ensure comprehensive real-time OWNP phase 2 progress reporting.

There is limited conceptual understanding on monitoring and evaluation at management level and weak capacity to support town water boards to effectively participate in monitoring water supply schemes; the benefits of project evaluation during implementation are either not appreciated or the OWNP-CWA reporting formats are seen as being too cumbersome.

It is understood that under NWI 2, 11 KPIs for water and 1 KPI for waste water are being considered along with 26 supplementary KPIs. It is very important for regional, national and international benchmarking and regulatory use that these include the 10 internationally accepted KPIs for utility performance[65].

In order to have WASH sector monitoring framework supported by an information system, tailored training for proper data and information inputs for enhanced MIS system users (national and regional levels) should be prioritized.

Computer hardware and software, as well as training, should be provided to strengthen management information at region and Woreda level sector offices. This should include financial management and accounting, and commercial systems for town WSSE at least for category 1-3 towns and for all voluntarily clustered urban/rural utilities.

The MoE has put in place governance mechanisms through which performances of the school WASH strategy can be tracked and monitored as integral part of the Educational Management Information System (EMIS). Performance indicators need to be expanded for School WASH so as to improve the value of the EMIS.

WASH sectors at national level should provide special support to emerging regions so as to be able to perform their planned activities and monitor their performances in human, technical and financial management aspects to the delivery of services.10 Long term recommendations

[64] COWASH terminology

[65] See for example, East and southern Africa Region Water Utility Regulators Association

9.14.1 Knowledge Management

The fundamental "Core" or "Enabler" of the OWNP is Knowledge Management, particularly in terms of (a) what is already installed, (b) what is being built, (c) who is operating, (d) who has "ownership", (e) what is functional, (f) what is the performance, (g) what are the gaps, etc.?

The OWNP Phase I Review Report comments upon the current status of the National WASH Inventory and current M&E systems.

Knowledge management is also documenting facts and figures after conducting researches on outcomes or impacts of WASH services. The research process can be applied research avoiding high level design and interpretation but should be conducted all the same if we want to measure whether we are meeting our objectives. There is significant peer-reviewed academic research published both within and outside Ethiopia related to and impacting on rural and urban WASH; for instance, pollution of rivers and lakes through industrial, commercial, domestic solid and liquid wastes; transmission of water borne and fecal-oral disease transmission levels, etc.

9.14.2 National WASH Inventory

The National WASH Inventory (NWI 1) was based on a combination of WASH related data from 12 million households and scheme inventories of communal water supplies and WASH facilities at health institutions and schools for rural and urban areas[66].

It is suggested that a new, or complimentary, way to achieve M&E and NWI may be through regular collection from, and tighter control of, data from woreda, towns, institutions, developers and operators, possibly by strengthening of the NWCO/RWCO hierarchy and their agents.

A data base will be required, perhaps similar to, or adapted from, the existing "Who, What, Where, why (4W) Scale-up Form" WASH Cluster spreadsheet[67] that currently includes regions, zones and woredas (excluding woredas in big cities) and is circulated to all participating DPs and CSOs[68] on a regular basis for updating emergency WASH activities and contributions. There are over 1,000 urban areas in Ethiopia, but these are not included on the spreadsheet. It has been proposed[69] that the already existing 4Ws matrix could include collecting development partners (IFIs, Bi-lateral, CSOs, etc.) information activities as well as for the OWNP development activities.[70.]

[66] Summary of a seminar 8.4.13 by Katherine Welle on NWI, "lessons learned and maximizing value" which in turn refers to data from *Butterworth et al 2013* and *Debela 2013*

[67]latest version 7.9.17

[68] It does not include all DPs and CSOs; it is just a list of those involved with emergency WASH.

[68]UNICEF Sept 2017

[69] UNICEF Sept 2017

[70]According to CRS, the program does not work much in CSOs/NGOs mapping and no effort is shown to bring NGOs to the program.CRS is very much interested to participate in achieving the program target, but recommends that the program coordination needs to be strengthened and work on mapping of CSO and NGO since their contribution is significant for the program achievement and NGO needs to merge in to the program

10. Long term Recommendations

10.1 Introduction

The medium to long-term objective (to 2030) of the OWNP is to achieve SDGs. However, where these goals are inappropriate, unachievable or unaffordable in the Ethiopia context then alternative standards will be developed.

The activities required will be continuation, establishment and formalization of the short to medium term actions described in **Section 9** above in order to create a robust water and sanitation sector able to meet the needs of urban and rural WASH in Ethiopia.

10.2 Water resources

- Full monitoring and control and sustainable exploitation of surface and groundwater.
- WASH fully incorporated in water resource master plans under WRM multi-sector activities, including CR-WASH.
    - All water sources mapped, abstraction registered and information held and regularly updated on regional data bases.
    - Long term monitoring stations (purpose-built piezometer tubes, capped wells and pumped wells with flow meters) installed across each region to monitor levels, quality and discharge to check on long term resource depletion or improvement.
    - One agency (in each region) responsible for issue of abstraction licences, issued only on basis of sustainable recharge in the case of groundwater and minimum dry weather compensation flows in the case of surface water.
    - Development of Environmental Protection Agencies (EPA), also responsible for monitoring and regulatory control of wastes water discharge to the environment (industrial and commercial, point source wastewater treatment plants, dispersed sources such as septic tanks, etc.)
    - Multi-sector governing body of the EPA (agriculture, hydropower, pastoral, urban and rural, industrial, commercial and domestic liquid and solid wastes, refugees, IDPs, climate influenced emergencies, etc.)
    - The same regional EPAs sufficiently resourced and having regulatory/legal powers to enforce licences.
    - Regional data bases accessible (read only) at national government level and also freely available to DPs, educational establishments, CSOs, etc.
    - TA provided at national level to assist regions with (1) setting up and running water resources data base and (2) sustainable water resource feasibility level studies.
    - Fully established innovative systems for catchment protection to improve recharge, involving agriculture, irrigation and livestock authorities and enterprises.
    - Trials may be undertaken on artificial recharge to improve sustainability of relatively shallow aquifers not topped by aquicludes.
    - Fully established and efficient supply chains (allowing import but maximizing local production) that anticipate procurement needs and that create stocks of most common spare parts for drilling equipment to avoid delays.
- SWM – fully engineered and protected waste disposal sites and maximisation of "3Rs" (reduce, reuse, recycle) to protect water resources and health impact, particularly on low income areas located near disposal sites.
- Hazardous Waste Management to protect water resources and health impact, particularly on low income areas located near downstream:

- Solid and liquid hazardous wastes will primarily be generated by industry (with enormous variations) and health institutions, although e-wastes may come from all sources.
- Hazardous solid waste that includes health care waste, e-waste and industrial waste should be handled separately from municipal waste so as to reduce the risk of irreversible pollution from heavy metals, hazardous health care waste, etc.
- Hazardous and industrial liquid wastes also have toxic effects and need special treatment to make them less harmful. Common examples of hazardous substances include paints, fuels, oils, cleaners, metal processing chemicals, agrochemicals, etc.
- All hazardous solid and liquid wastes generated must receive treatment at the production facilities prior to disposal in a manner approved by the municipal authority. Following treatment, the proposed method and timing of the disposal must also be approved by the municipal authorities following consultation with regulatory and environmental bodies.
- Regulations should be enforced and financial penalties and high disposal charges should be implemented to encourage in-factory processing and recycling of industrial wastes. In the management of these wastes it is better to implement fully the "polluter pays" principle.
- The industries should take responsibility for the processing, collection and safe disposal of the wastes by contracting with the municipality or specialist enterprises. They should also cover all the costs encountered in the management of these wastes.

10.3 Technology innovation and mix

- Fully sustainable water and sanitation technology mix resilient against climate change, demographic shifts, rapid urbanization, impact of industrial and agricultural development, arid area encroachment, etc.
- This will be tailored to meet the diverse needs within Ethiopia; such as dense urban development, highland areas, arid zones, refugee areas and population shifts.
- Involving "risk-informed planning"[71].
- Optimisation of existing infrastructure.

10.4 Urban Sanitation

Appropriate level sanitation services based of sustainability master planning and feasibility studies including:

- Centralized systems
- DEWWATS
- Low cost FSM
- Reuse of liquids and solids
- Integration with SWM where appropriate
- Development of city/woreda wide sanitation plans
- Complete integration of urban sanitation and environmental protection, including SWM, industrial solid and liquid wastes
- Full enforcement of urban and industrial physical plans that include comprehensive watershed management and protection

[71] UNICEF term

10.5 Established national utility regulation and large (clustered) public utilities

10.5.2 Potential new implementation modalities

In order to meet the exacting requirements of GTPII and the SDGs, to fill gaps (for instance, urban sanitation, drought resilience, M&E) as well as to take on board the strategies and guidelines that have been developed since the start of the OWNP, then new "implementation and operational modalities" will need to be developed in line with the principles listed in **Table 9.2**.

The reforms will need to cover both urban and rural services. Such modalities should be designed for smooth transition from existing implementation routes as described in the Phase I OWNP and modalities as described in **Sub-section 4.1.2** (rural) and **4.3.2** (urban) and can be used to strengthen such routes (for instance, the WRDF). By way of example, a possible new implementation and operational modality to include urban WASH and MVWS schemes may be tentatively illustrated, for initial discussion purposes, by **Figure A8-1** in **Annex 8** (for illustrative purposes only – not an official government proposal).

10.5.4 Utility regulators

According to the UNICEF Webinar series on accountability[72], to achieve effective and sustainable service provision, it is important that the links between actors and institutions are clear, accountable and enforceable. It states that accountable WSS delivery requires public institutions to put *mechanisms in place that monitor* the degree to which public officials and institutions comply with established standards*, impose sanctions* on officials and private actors who do not comply, and *ensure that appropriate corrective and remedial action* is taken when required. This is commonly achieved through independent national or (less commonly) regional regulators.

Note: This subject is currently under discussion in Ethiopia but no firm proposals have yet been made or adopted. There is currently South-South dialogue between Ethiopia and Brazil (which has a federal system of government) over establishment of utility regulator(s) and more local examples may be found in Eastern and Southern Africa[73]

10.5.5 Delegation of services

There are many advantages for large or voluntarily grouped (and eventually formally clustered) municipalities/utilities to delegate some of their services to delegated operators which will be responsible either for a specific geographical area, where accountability and efficient service delivery to customers may be greatly improved, or for specialist technical activities, such as operation of FSM treatment systems and solid waste disposal sites.

In this case, the mandated operators (public utility) should sign a Delegated Service Management Contract (DSMC) with the delegated operators. An example of various DSMC types used elsewhere can be provided by the consultants. The main advantage of a DSMC relates to the physical and financial ring-fencing of services and in establishing a clear full cost recovery (that is, including investment costs) modality in order to both deliver and sustain services.

10.5.6 Performance contracts

- Performance agreements between asset owners (towns and woredas) and clustered utilities with oversight of internationally recognised KPIs by the national utility regulator.

Employee incentive schemes should be introduced in both SMCs and DSMCs to drive efficiency and improved levels of service. For instance, staff might receive a monetary bonus or other incentive for achieving high KPI (Key Performance Indicator) scores in water and sanitation provision. Additionally, competition between municipalities in any Region, and acknowledgement through award and recognition, should be initiated to drive improvement:

[72] Accountability for sustainability of service delivery" dated 16.2.17

[73] The Eastern and Southern Africa Water and Sanitation (ESAWAS) Regulators Association; including Zambia, Kenya, Lesotho, Rwanda, Mozambique and Tanzania

Ability to cover operation and maintenance costs from revenue and to create a surplus for repayment of loans for capital infrastructure would be a high level and valuable long-term indicator worthy of recognition.

Large private operators should only be considered once systems have been fully installed and financial sustainability has been clearly demonstrated, since private operators are generally not able to receive International Financial Institution (IFI) grant money and since private companies will be risk averse and likely to pass risk on to customers in increased charges. It is envisaged that, for instance, a delegated sanitation operator serving several adjacent towns should, at least in the short to medium term, be publicly owned. In this way, charges can be controlled to ensure affordability but at the same time minimizing outside subsidies.

There should be full cooperation, and written agreements put in place, between all departments and organizations within a municipality or cluster of municipalities with respect to water supply, sewerage, sanitation services, beautification and greening, health services, etc. It is again expected that the municipal authorities, with assistance and guidance from the regional authorities, will play leading roles to ensure that such full cooperation and written agreement are put in place.

One clear example of where inter-departmental agreements will be essential is in relation to the planned use of Decentralized Waste Water Treatment Systems. Since the DEWWATS will be adjacent to buildings (medium rise clusters and institutions) within the town, then the technology and re-use paths will need to be fully evaluated at master planning and feasibility stages, fully tested through business models, in terms of financial sustainability, financing, economic value of products (soil conditioner and biogas), responsibility for operation and maintenance, use of private sector, community acceptance, health and safety, ESIA, etc. Inter-department cooperation will be required for many of these links in the DEWWATS "supply chain" (for instance, between the operator of the plant and users of treated products).

10.5.7 Conditionalities

Historically, water projects have received higher attention and are better funded, but by tying water and sanitation (including SWM, as in the UNICEF/DFID One WASH plus 8 towns) then, among other things, it will promote sanitation as an integral and indispensable urban (and rural) WASH component and something that is essential for economic growth in Ethiopia.

There will be exceptions to this principle of tied funding; some towns have already completed their water projects and new funds should be aimed primarily at sanitation; in some cases, funders are only interested in either water or sanitation, or in some cases just solid waste management.

10.7 Community engagement

Targeted TA for community management of WASH including

- point-of-use water treatment (all users)
- Appropriate sanitation systems (flood plain, highlands, arid areas, etc.)
- Full community engagement with safe rural water and hygienic sanitation practice.
- Fully sustainable self-supply and shared community systems.
- WASH as "business package" involving private sector in sanitation marketing.
- Rainwater harvesting, shallow wells, etc. fully linked to agriculture and livestock activities; drought and flood resistant.
- Fully effective HEW program.

10.8 Capacity building

Fully developed capacity including:

- Public and private WASH skills

- Safe water quality monitoring in all towns and villages supported by sufficient accredited laboratories throughout each region
- Water abstraction licensing and monitored and enforced pollution control (both dispersed and point source) – see also **Sub-section 10.2** above.

Also refer to previous **Sub-section 9.5** and **Section 11** below for more detailed recommendations for capacity building.

10.9 Procurement and implementation

- Established and efficient procurement, supply chain and implementation procedures with maximum use of national manufacturers, suppliers and contractors, while not precluding international suppliers and competition.
- Full contract compliance and professional contract management under guidelines based on collaborative international and national approaches.

See also **Section 14** below for more details of recommendation for procurement.

10.10 Advocacy

- Fully established advocacy procedures for water security, sanitation and hygiene, with responsible engagement at all levels (government, utilities, DPs, CSOs, private sector).
- Full community engagement with safe rural water and hygienic sanitation practice.

See **Sub-sections 4.2, 4.6**, **9.7**, etc. and **Annex 5** for more details of recommendation/proposals for BCC and advocacy.

10.11 Emergency WASH

- Emergency WASH reserved for unpredictable occurrences, not regular drought and flood cycles.
- Fully developed and implemented Emergency, Preparedness, and Response and Recovery (EPRR) procedures.

10.12 Urban Planning

- Full enforcement of urban and industrial physical plans that also include watershed management and catchment protection.

10.13 M&E

- Comprehensive WASH data base and updating system fully implemented.
- Regular dissemination of appropriate information to national regulator, regional bureaus, woredas, utilities, etc. for M&E use, asset management and investment planning.

See also **Section 15** below for more details of recommendation/proposals for M&E

10.14 Institutional (schools and health facilities)

- Institutional WASH budgets: Ring-fenced sector CAPEX and OPEX budgets for WASH in schools and health facilities.
- Water supply and sanitation services to/from property boundary being the role and obligation of utility or WASHCO.

10.15 Enhanced Multi Sector Inclusion

- Inclusion of all relevant water resources, sanitation and environmental related ministries in the OWNP WIF or through other formal agreement.

It has been decided that the future approach for the OWNP should be a combination of two options (i) "continuity" of the Phase I modality and (ii) "redesign a new approach and modality for Phase II". The holistic principles (Integration, Harmonization, Alignment and Partnership) embodied in the OWNP should be retained and expanded to fully allow for parallel sectors such as H&EH, SWM, commerce and industry, agriculture and livestock, land management, employment, women's interests, etc. as illustrated below.

Future changes to the WIF and OWNP MoU may be considered to allow for inclusion of cross-cutting and/or new areas, if agreed upon. Such changes could be timed to come into effect before the end of GTP2 timeframe.

11. Capacity Building

11.1 Introduction

Capacity development efforts need to be targeted to achieve more effective and WASH program implementation and sustainable operations through enhanced institutional and management capacity. This component includes support to improve skills and capacity of WASH organizations and implementing parties at federal, regional/city, woreda/town and kebele and community levels to plan, manage and monitor Program activities as well as strengthening M&E capacity at all levels and support to qualitative research and studies.

Assessment of OWNP implementation to date at regional and woreda levels indicates lack of; capacity, system development, community involvement, planning based on adequate data and needs assessment, monitoring, learning and knowledge management, operational and management capability, logistics support, timely financial release, delayed external procurement processes, etc.

As per the WASHBAT workshop held on June 6-8, 2017 at Capital Hotel in Addis Ababa, the following points are found to be the main bottlenecks of capacity building issues.

1. No systems for rewarding individuals/households that use sustainable technologies for rural sanitation
2. No incentives for private sector (such as tax exemption or loans)
3. No full package capacity development plan (including training, monitoring, coaching, software, hardware) based on needs assessment

- Weak stakeholders' coordination mechanism
- Inadequate budget and weak utilization
- Lack of a system to enable users and stakeholders to validate plans
- Lack of attention at regional level for scaling up best practices & new technologies
- Lack of clear roles and lines of accountability between different stakeholders within the sector and across relevant sectors
- Absence of clearly defined procedures and channels for user participation in the planning process
- Lack of strategy and guidelines for implementation: to be customized to different schemes and service provision
- Lack of policy and strategy to engage the private sector in management and provision of service
- Absence of consumers rights enforcement mechanism

11.2 Approach to Capacity Building

Capacity building is necessary to improve the ability of WASH sector professionals and service providers to better plan and manage water supply and sanitation. The composition of the capacity building package will be determined on a case-by-case basis considering the specific capacity building requirements for each woreda or town. Capacity building interventions, especially training of WASH staffs at lower level on planning, procurement and financial management plays a major role in ensuring effective project implementation based on a capacity development need assessment. There is a need to design a human resource strategy covering both urban, rural and pastoralist areas. Human resources (HR) capacity building should be provided on a continuous basis and include intensive initial training as well as refresher training, coaching and follow up. So as to implement these activities a new capacity development unit shall be established at all levels in OWNP structure. The units could facilitate procedures for new staff orientation, refresher training programs, regional workshops, etc. The unit could also support the Regional WASH Coordinator in the development of training materials based on latest development, new approaches, new learning from the field and use the training program to stimulate actions, innovations, and create momentum to go forward

A cascaded training approach should be used for rural water supply and sanitation. For urban water supply and sanitation, it will also be relevant to use a cascaded training approach for promotion of good hygiene practices and improved on-site sanitation. A cascaded training approach is less relevant for urban water and sewerage utilities, whose capacity needs, should be addressed through formal courses and on-the-job training by relevant training institutions, NGOs and others.

The other area of immediate focused TA, including on-the-job capacity building, is expected to be at the level of Regional WASH Coordination Office and Regional WASH sector bureaus which will be expected to support the master planning and funding bids within their region.

11.3 Guidelines and manuals

Curriculum and delivery of training courses to elevate the professional capacity of city officials and SMMEs in a range of priority aspects shall be established. The OWNP One WASH National Program issued, in February 2016, a series of "OpenWASH" Training Manuals: They include five manuals, including Urban Water Supply, Urban Sanitation, Solid Waste Management, Working with People and Guidelines on use of the manuals and will be particularly useful for the cascaded training.

WASH guidelines, manuals and other relevant training materials need to be reviewed, adapted and updated, and any new ones shall be prepared as required. Operation and maintenance manuals are required for different types and components of urban water supply schemes and equipment. Manuals should be translated to Amharic and other major regional languages as appropriate for the intended user group.

11.4 Systems and Institutions

Assistance is required to introduce procedures for handing over responsibilities, manuals, guidelines and data when WASH staff leave their positions.

HR capacity building should focus on the supply side (training institutions) as well as creating demand from potential beneficiaries. Focus should be on institutionalizing and professionalizing training capacity by supporting EWTI, TVETCs, HSCs, universities and other training institutions to provide quality and demand-responsive long-term courses as well as tailor-made short-term courses. Universities and training institutes have a major role to play in training water professionals and in organizational and institutional capacity development.

Research and development on WASH should also be supported in sector wide identified priorities; and promoting innovation and knowledge management in the WASH sector through learning and sharing events and other appropriate measures. More research should be done to demonstrate the real costs and the impact of capacity development.

Coordination and partnership with EWTI, TVETCs, HSCs and universities should be enhanced as well as knowledge sharing should also be promoted on the challenge of the WASH sector in an effort to bridge the gaps that will facilitate in achieving the GTP 2 target.

Particular attention should be given to ensuring effective capacity building at the community level using approaches and procedures established by the WSSP, CMP or NGO assisted projects. By doing so, we can strengthen decentralized capacities and provide complementary support and monitoring. The capacity building unit which will be established under NWCO/RWCO office will address sector-wide capacity building requirements in an integrated manner and to thereby enable the training centers to increasingly become a "center of excellence" with state-of-the-art skills, knowledge and competence

11.5 Operation and Management (O&M)

Capacity building at service provision level should include system development, financial analysis, procurement of facilities, operations, training of staff and development of leadership programs, etc. Training shall be extended to

both in-house staff and workers and also to SMMEs. Medium and short-term training aimed at generating technical and professional staff and leadership will be organized with different educational institutions. Training shall be cascaded to TVETCs/HSCs (Technical and Vocational Education Training Colleges/ Health Science Colleges) and to artisans.

High priority should be given to capacity building in O&M for both rural and urban water supply and sanitation. This should initially focus on addressing the significant number of rural piped water schemes which appear to have been constructed without sufficient community and woreda involvement and ownership and which now have serious O&M problems.

Appropriate and sustainable solutions should be identified so as communities have access to affordable spare parts and maintenance services within a reasonable distance, preferably by the private sector. We should also establish post construction support units for schemes that cross multiple villages in remote arid and semi- arid areas.

We shall also build the capacity of utilities through provision of human resource, improving working environment, facilitating operation and maintenance activities, improving revenue collection through provision of billing software devices, facilitation to improve water demand management and customer care and management skills. Pilot clustering of water utilities shall be started for small towns to create a larger customer base, improve revenue collection, share experiences in management and technical operations and reduce operating costs.

Management of community water supply systems through private water operators shall be started to be effective in improving functionality of water supply systems. Such a model, however, requires significant investment in capacity building of the private water operators and establishment of adequate mechanism for monitoring the performance of the private operators. The water supply systems constructed or upgraded can be handed over to private water operators (PWOs) for operation and maintenance under public-private-partnership arrangements.

The private water operators will be trained and provided operation and maintenance tool kits. This will enhance capacity of the PWOs to manage the systems, collect revenue and undertake timely repairs, and greatly contribute to high functionality and hence increases sustainability. Training of private water operators and water user committees will contribute to effective management of water supply systems and increase functionality.

11.6 Post construction support unit establishment and strengthening

Many rural community-managed water supply programs in the countries have been characterized by poor performance. In response OWNP has proposed post-construction support (PCS) for Rural WASHCo and Category 4 and 5 small populated towns.

it is unrealistic to expect that particularly rural communities can be left to their own devices after a water project is completed, and that for small towns and rural water supply systems to be successful, communities need some post-construction technical assistance.

Without access to a reliable supply of spare parts and to sufficient technical expertise to repair problems, it stands to reason that all hand pump and other motorized system, borehole pump would over time fail. The unresolved question is what form PCS should take and what types of PCS are most effective. Where and what number and staff composition is needed for post-construction unit. Two broad strategies for providing PCS have emerged.

The first, “demand-driven” approach is to ensure that spare parts and technical services are available, but then leave it largely up to communities themselves to seek out such services and to pay for them when needed. The second is a more “supply-driven” approach to provide unsolicited repairs, technical assistance, training, and trouble-shooting to communities based on M&E by Woreda O&M team and both government actors and private institution are involved in support activities.

Establish 20 post- construction unit consist of engineer, Hydro geologist, a hygiene expert, and a community mobilizer seconded to the region bureau staffs, these members are not supposed to do hand pump repairs

themselves, Such as for rural strengthen the Woreda water and Health office rather to help the Woreda or zone obtain the support and training they need to run and repair the system and to help resolve any management and water use conflicts that arise, and to update business plan for MVS and small town water utility , plan new capital project. Besides Zone or Woredas needs to be strengthened with maintenance tools, spare parts etc.

Another important resource for WASHCo are to support private institution "water supply and sanitation O&M team, including sanitation marketing" need to be established using TVETs technicians and fresh graduate engineers, living in the Woreda and or village.

These are private individuals originally trained during the project implementation process to do routine maintenance or repair work on boreholes and other water and sanitation schemes at the request of WASHCo. The team are frequently called upon to obtain the spare parts needed by the WASCHCO and then to install these parts. WASHCo s must pay. For the services of the local institution from revenues collected from village households or money obtained in some other way. The Region post construction unit established at region/Zone or Woreda level may help WASHCO and weak utilities link up with private institution/ local O&M team when major repairs are needed.

11.7 Planning, procurement, financial management and monitoring

It is expected that technical assistance (TA) will be urgently needed to support funding bids. The TA will be focused at individual and clustered municipality and utility level in order to concentrate on getting coherent master plans together capable of attracting funding. The TA involvement at this level will include on-the-job capacity building and it is necessary that counterpart staff are assigned and that their individual progress is monitored, assessed and reported.

Training and support in integrated and harmonized WASH planning and budgeting will be provided at woreda, zonal and regional levels as well as at federal level.

Capacity building is needed in procurement and financial management, particularly at water utility, woreda and regional levels. Training in fiduciary management will contribute significantly in improving financial management of WASH sectors.

So as to improve slow procurement processes, periodical contract execution monitoring by NWCO/RWCO/PMU, tailored trainings on contract management, supervision of consultants and implementation of works and strengthening the coordination of procurement processes of WASH sector offices should be done.

Selection criteria for choosing a contractor and measuring qualifications of consultants should be defined and adhered to during the planning phase Procurement units should be strengthened with trainings for speeding up bid processing and strengthening contract management by technical assistance services to bring procurement efficiency. Priority will be given to capacity building in monitoring progress and impact and use of monitoring data for planning.

11.8 Strengthening private sector capacity

Information, training and business opportunities should be offered to the private sector to strengthen its involvement in and contribution to the WASH sector. Initial priority should be increasing capacity in drilling, hydrogeology, design and construction of piped water schemes, contract management and construction supervision, environmental and social impact assessments and quality standards for construction. Corporate Social Responsibility (CSR) activities have the potential for companies (often those that use water) to contribute to monitoring, safe water use and environmental protection in their locality. Many companies are signed up the UN Water Stewardship program which supports private sector involvement in WASH.[74]

[74] *https://ceowatermandate.org/*

12. Technical Assistance and Academia Support

12.1 Technical Assistance

The Program is pursuing ambitious targets while at the same time seeking to fill gaps in capacity at a number of levels. This, coupled with the relative size and complexity of the Program, the many new roles and responsibilities it entails at all levels, the absence of a robust regulatory and monitoring framework and the promotion of new organizational framework, contracting modalities and technologies, will mean that provision of relevant and timely Technical Assistance (TA) will be essential. Such TA will be drawn from international resources to compliment that which is locally available.

The technical assistance relevant for Phase II will include:

1. Support to establish a robust capacity building program to contextually design, deliver, evaluate, learn and document results.
2. Facilitate support in hydrogeological mapping/ground water mapping.
3. Support in establishing mobile technology for real time monitoring and data collection mechanism in regions and woredas.
4. Introduce new technologies in water and sanitation such as wind and solar and other energy sources and facilitate demonstration on the ground wherever possible.
5. Support regions and woredas conduct simple applied research on WASH with a view to support enhancement of sustainable and equitable services.

TA will be provided at federal, regional, city, zonal, woreda and town levels. Planning, coordination, management and quality assurance of TA will be the responsibility of GoE through its contacting entity.

The modalities for the Technical assistance will include

(i) by GoE through WPMUs in participating ministries and bureaus at federal, regional or city levels using funds from the Program budget; or

(ii) Directly by a partner, which can be a bilateral or multilateral aid agency, CSO or other organization.

In both modalities, TA will be provided according to a consolidated annual WASH plan and budget, including a procurement plan as approved by the NWCO. Any technical assistance will be short term and output must include hands-on training to local actors.

12.2 Competition for funding

There will inevitably be a shortage of funding and sponsors (GOE, DPs, CSOs, private) will want to invest where there is the best "return" in terms of customer level and reliability of service and minimization of environmental impact. This can be achieved through some competition for funding within each region based on well prepared master plans and feasibility studies (see **Sub-section 9.9**). In order to make the competition fair, for instance large cities will have greater professional capacity than small towns, then it is expected that TA will be needed to assist with sustainability master planning and feasibility studies and to support funding bids.

The TA shall be focused at individual and grouped/clustered municipality and utility level in order to concentrate on getting coherent master plans and feasibility studies together that will generate "bankable MWP[75] projects" capable of attracting funding. The TA involvement at this level will include on-the-job capacity building and it is necessary

[75] Minimum WASH Package

that counterpart staff are assigned to work with any TA consultants and that their individual progress is monitored, assessed and reported.

12.3 Enhancing the integration of WASH Training Centers of Excellence

OWNP will benefit more if it widens its resources base through establishing strong links with academia including institutions of higher learning. This link would be used for overall capacity building including training of technical and operational staff, innovative technical development, research, production of guidelines, advocacy, sharing good practice, professionalization, etc.

The Ethiopian Water Technology Institute (EWTI), being a research and a training institute, prepares and conducts short term practical training on courses designed to fill identified skill gaps of manpower working at different levels in water development and related activities. It also conducts long term trainings as per the national technical and vocational education and training (TVET). TVETC graduates and private sectors qualification framework on higher level programs in accordance with the manpower requirement of the sector.

EWTI will also support research and development on WASH sector wide identified priorities; and promoting innovation and knowledge management in the WASH sector through learning and sharing events and other appropriate measures.

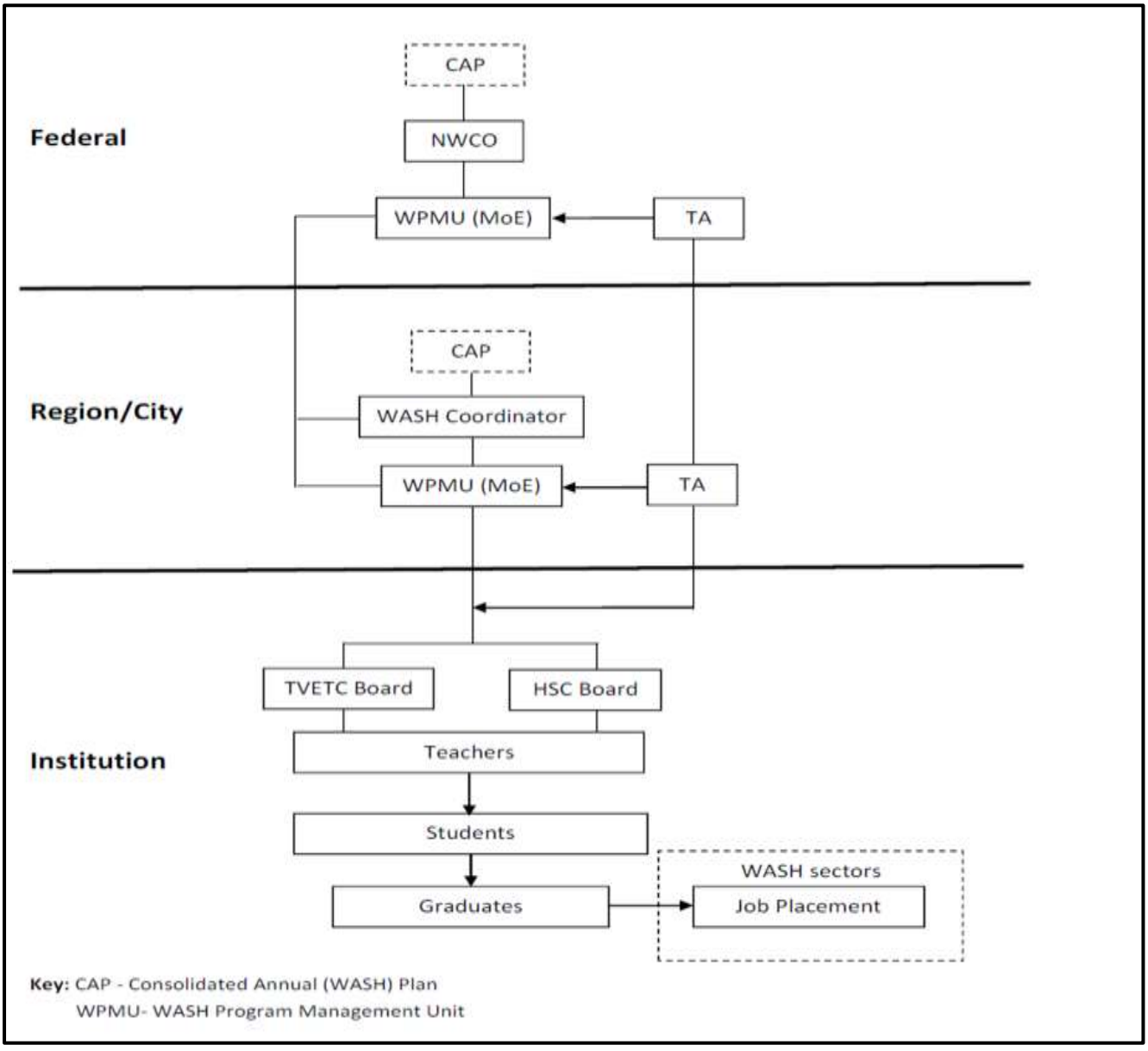


Figure 12-1: Organizational Diagram for Support to TVETCs and HSCs

Key: CAP - Consolidated Annual (WASH) Plan

WPMU- WASH Program Management Unit

In WASH capacity assessments of 16 TVETCs and HSCs conducted through SNV and Water Aid, the following capacity gaps are identified:

- Limited and/or non-existence of essential physical and training resources, including equipment and tools, reference books, logistics and support facilities
- Not adequately consulting relevant WASH stakeholders when planning training
  - Deficiencies in assessing and responding to their environments and developing appropriate training strategies and programs
  - Skill gaps among instructors in conducting practical training, with only a few teachers having completed teaching methodology courses
  - Limited knowledge of WASH policies and strategies

To further institutionalize and professionalize the training of much-needed skilled technicians for the WASH sector, the Program will seek to replicate and scale up the support to TVETCs and HSCs provided through UNICEF, SNV, Water Aid and other organizations. This assistance will include support to curriculum development and lesson planning, teacher training and basic training equipment and tools for workshops and laboratories.

The graduate level study on WASH (offering Master of Science in WASH) which is established at Wollo University is one area where collaborative actions will be a good capacity building resource in the future. Other universities and institutes that are training engineers, environmental health, environmental engineering, water engineering etc... are good resources that can be used in many types of technical assistance, research, design and consultancy services.

12.4 Water treatment and public health laboratories

Regional bureaus shall explore how links with universities both in Addis Ababa and in the Regions can be strengthened in order to tap into existing and proposed testing and laboratory capabilities. Currently MoFEC uses two laboratories in Addis and Oromiya region, but could well benefit further from other regional testing capabilities.

13. Funding and Financial Management

13.1 Introduction

The Program will follow GoE's financial management rules and policies. MoFEC will be responsible for the overall financial management of the Program and will carry out financial management in accordance with sound financial management procedures including internal control mechanisms in line with GoE's financial management policies and guidelines.

13.2 Sources of Funding

Program funding comes from the following sources:

13.2.1 Government of Ethiopia

The Government of Ethiopia's contributions come from federal, regional, town and woreda level. Government financial support for WASH is, for the most part, by way of the Block Grant that is channeled from the Federal to the Regional governments for both recurrent and investment costs.

While the block grant amount will be allocated to WASH at regional level as regional contribution, federal government contributions come as special purpose grants like the MDG fund, Food Security Program, etc. that will come to regions and then part of the fund is allocated to WASH at regional level.

Institutional (schools, health facilities, government offices, prisons, etc.) WASH should be increasing financed from ring-fenced sector budgets and *less from CWA and CSO sources.*

City administration also put substantial amount of contributions as direct grant to utilities or as co-finance to donor financing.

13.2.2 External Financing Agencies

Donor contributions made specifically for the Program constitute the core budget (including the Consolidated WASH Account). Donors that will contribute to the Program but not through CWA will be considered in the consolidated annual plan resource mapping.

13.2.3 Non-Government Organizations (Civil Society Organizations)

NGOs are investors in, and implementers of, the WASH program. Their funds, however, do not flow through government channels and are therefore "off-budget". However, NGO planned expenditures on WASH are also included in consolidated annual plan resource mapping.

13.2.3 Private Sector

There is a need to promote co-operative bank/MFI financing for solid and liquid waste projects through a group loan guaranteed by the municipality of towns. A dedicated scheme for solid and liquid waste management shall be introduced and lessons learnt from existing schemes to support replication in regions and scale up.

Sanitation marketing shall be promoted through campaigns and through improved access to finance (such as MFIs) for youth groups to set up enterprises. SMMEs may be supported through low interest loans.

13.2.4 Communities

All communities undertaking WASH projects make a cash/in-kind contribution to construction/installation costs. These contributions are also "off-budget" but are recorded and reported and included in the resource mapping that

initiates annual WASH budgeting in the woredas. Community contributions to the Program include contributions from rural communities and urban residents.

Community contributions, although some regions have set it to be 30% or more, is assumed to be 10% for both urban and rural communities. Rural communities will contribute 5% in cash and 5% in kind (labor, materials, etc.). The fact that rural water services are aiming at MVS and rural pipe system may need to set up a tariff system than can only depend upon 10% contribution.

By larger utilities higher proportion of co-financing will be attempted while by smaller towns maximum contribution may be limited to 10% considering their current financial situation. However, the program encourages utilities in urban and rural areas to attain higher cost recovery ratios during Phase II.

13.2.5 Water Utility Earnings

Urban resident's contribution is through water service charges. Consequently, the water utilities contribute in OWNP from own earnings in the WASH fund. It will be accounted at town level for grant programs while for loan financed projects it will be included in to CWA at federal level through transfers as co-financing.

Primary drivers to funding may be:

a) Adoption of this OWNP document 2018 (see **Figure 7.1** in **Sub-section 7.3**)
b) Reliable data bases and reporting
c) Groundwater and surface water resource mapping
d) regulatory enactment and enforcement (urban planning, pollution control, abstraction licensing, etc.),
e) Plans based on sustainable master plans,
f) Large package contracts for study and design, supply and implementation involving international bidding and facilitated letters of credit, etc.
g) Water and sanitation sector reform – utility regulation (urban and MVWS), clustering of operational economy of scale utility, performance contract and KPIs, delegation, PPP, etc.
h) country economic state, GDP (internal funding) Geo-politics (external funding)

Also:

- Strengthening performance-based program funding; creating awareness and encouraging government at all levels to allocate additional funds to WASH activities
- Fund allocation to priority activities and financial disbursements for implementation of activities in accordance to approved financial plan and disbursement schedules improving incentives for the private sector to provide WASH services
- Appealing to committed donors to provide additional funding
- Appealing to interested but uncommitted donors to contribute to the Program
- Introducing cost-effective designs; water supply, drilling and borehole construction methods; low-cost technologies, cost saving measures by using renewable energy sources, etc.
- Increased emphasis on self-supply, and in urban areas on reducing demand through water efficiency audits, water conservation, reuse and other demand-management measures.
- Minimizing non-revenue water and improving revenue collection

13.2.6 Sanitation Levy Fund

Operational costs of sanitation will likely exceed direct revenue for some time and it is expected that subsidies will be required for "downstream" services. This may be achieved through a sanitation levy fund (SLF) or more localized forms of cross-subsidy. The SLF concept is to add a small percentage to all water bills (for instance 2% existing in

Lusaka and 5% proposed in Kampala) with this revenue being exclusively used to support the FSM/LWM sanitation chain from on-site latrine to final disposal.

13.2.7 Micro-finance

There is a need to promote co-operative bank/MFI financing for solid and liquid waste projects through a group loan guaranteed by the municipality of towns. One example is the Oromiya Credit and Saving Share Company (OCSSCO) who provide loans to co-operatives formed by youth and women groups.

A dedicated scheme for solid and liquid waste management should be introduced and lessons learnt from existing schemes to support replication in regions and scale up. See also Annex 9.1 under the IUSHSAP for details of available micro-finance schemes.

13.2.8 Subsidies and cross subsidies

Currently, the water sector does not raise enough funding through tariffs to meet operation and maintenance costs. Once the water sector has been strengthened there would then be scope to cross-subsidize costs for the sanitation sector.
Tariffs for water supply should be reviewed by using the Ministry of Water guidelines. Tariff increases should be proposed to match inflation to ensure affordability, following master planning and associated financial analysis. Tariffs need to be consistent and with more clarity on charging for domestic, commercial, industry, government and water points.

Collection of revenue should be facilitated by improved billing and collection systems in utilities. There is also the potential to combine water and garbage collection bills through a tiered tariff, as demonstrated in Dire Dawa city (see also in IUSHSAP Annex 10.2) and this could be extended to cover FSM services.

Direct subsidies to the downstream end of the sanitation chain rather than the upstream end should be applied in order to make services delivery cost effective; such considerations to be included in master planning/ business planning.

13.2.9 Private advertisers

The private sector could also be a financing source, e.g. for business advertisement on water kiosks, street dust bins, etc.[76]

13.3 Principles

The guiding principles for Program financing are:

1. The cost recovery strategies promulgated in the water resource management policy;
2. different financing sources for urban water, urban WASH, rural WASH and CR-WASH;
3. institutional WASH ring-fenced and channeled through sector budgets; consideration of existing financing practices;
4. Consideration of the available financial resources; consideration of the CSO (NGO) contribution in WASH, especially in rural areas;
5. Considerations of all bilateral, regional and international organizations contribution for WASH;
6. Urban residents through utility funding should contribute at least the same share of costs as rural communities;
7. federal and regional government contributions are assumed to increase during the Phase II planning period;
8. city administration contributions are computed by assessing current matching fund allocations for water supply and wastewater projects.
9. It is also assumed that these contributions will increase donor contributions are estimated by assessing individual donor commitments;
10. WASH contributions from NGOs are assumed to continue at the present level.
11. Investment funding from water utilities are assumed as user contributions.

[76] Currently there are significant number of street dust bins in Addis Ababa and other cities sponsored by business organizations with their business advertisement on them.

12. Water Resource Development Fund will be accessed by towns and cities in Phase II better than what was contributed in Phase I.

13.5 Funding Contributions

See **Sub-section 16.8.12.**

13.6 Financial Management – Roles and Responsibility

Federal Level

MoFEC is responsible for the financial management of GoE and CWA funds. During Phase I activities such as opening foreign currency accounts for Development Partners and the request and receiving funds process, opening of a birr account and transferring development partners' fund in to CWA, and transferring funds on the basis of approved plans, budgets and reports is well established.

What should be followed and strengthened hereafter are:

- Ensures that adequate internal controls are in place and adhered to
- Reports on use of WASH funds to government, Development Partners and other stakeholders
- Ensures timely replenishment of the Consolidated WASH Account and fund disbursement to implementing agencies (WPMUs and BoFECs) and NWCO through MoWIE.
- Sectoral ministries are responsible for reporting to MoFEC on all Program financial matters.

Regional Level

BoFEC is responsible for management of GoE and CWA funds at regional level. At this level also opening special account, maintaining the budget of regional sector bureaus and disbursement; transferring funds on the basis of approved plans and budgets to special accounts are well established. What should be followed and strengthened hereafter are:

- Monitors performance and receives reports from WoFEC
- Provides technical support to ensure that proper accounting systems established are being maintained in each implementing agency;
- Provides internal auditing,
- Issue of necessary detailed guidelines to all implementing agencies in the management and administration of OWNP funds
- Maintains regular communication with the implementing agencies
- Ensures timely replenishment of the regional WASH account and fund disbursement to the implementing agencies (RWCO, RWPMUs, WoFEC and towns).
- Prepares and submits financial reports to MoFEC and regional government

Woreda Level

WoFEC is responsible for managing GoE and CWA funds at the woreda level. At this level also opening special account to receive WASH funds from BoFEC is well established. What should be followed and strengthened hereafter are:

- Ensuring that proper accounting systems and competent accounting staff are established and maintained
- As a member of WWT assists the WWT in the planning and budgeting process
- Facilitates timely fund replenishment
- Provides the WWT with regular financial reports

- Collects and aggregates required financial data and information and submits reports to the Woreda Administrative Council (Cabinet) and BoFEC each quarter
- Disburse payments to WASHCOs based on authorization of the WWT

Town Level

(a) Loan Component

Water utilities are directly responsible for administering the loan component transferred for water supply expansion. The system of opening accounts and transferring contribution to WRDF is established in some towns but need to be accessible to all towns and cities where all who are able to access loans should follow the following procedures.

- Opens a special account to receive loan from WRDF
- Transfers the own contribution amount to WRDF as per agreed schedule
- Ensures that proper accounting systems and competent accounting staff are established and maintained
- Provides the WRDF with regular financial reports
- Collects and aggregates required financial data and information and submits reports to the WRDF each quarter

(b) Grant Component

The grant component is transferred from BoFEC to ToFEC office. The ToFEC office disaggregates the WASH fund in water supply and sanitation component based on the approved budget. The grant for water supply improvement is transferred to the water utility. Other WASH components are managed by Town Finance and Economic Development Office.

If small town utilities recognize lack of capacity to implement the WASH fund they can delegate the regional/zonal water office in writing. They will request BoFEC to transfer the grant amount to the regional/zonal water sector institution to implement their activities. The regional/zonal institutions should execute the plan according to their agreement and or facilitate the private sector to take part in the implementation of the approved town plan.

13.7 Mitigation measures for budget availability and utilization risks

The following measures can reduce the risk of interruptions and shortfalls in budget allocation:

- Introduce a mechanism in the Joint Financing Agreement with a specific section stating that all parties should ensure the timely availability of committed funds.
- Design project financing so that the sequence of works to be financed by the GOE comes first to force GoE WASH structures to avail the committed budget
- Use all available forums to create awareness on the importance of GoE's budget allocation
- Introduce biannual forums to review availability of funds and ensure that corrective actions are taken.
- Designing mechanisms that ensure SPG (special purpose grants) dedicated to WASH are actually spent on WASH activities.
- Matching funds from water utilities, cities and regions should be on-budget and captured in budget proclamation
- National WASH Steering Committee to take steps to ensure that national authorities allocate the committed budget
- In cases where part of committed GOE budget cannot be made available for justifiable reasons, bring donor funding forward with the agreement that next fiscal year the GoE will increase its budget allocation.

- Move away from non-sustainable systems that demand perpetual budget allocation to water systems and pumping technologies that can serve communities for many years. (Shallow wells and hand pump technology has been tested for many years and its failure rate has demanded new wells and pumps every year.)

13.8 Fund Flow and Channeling of Funds

a) Fund Flow

The preferred and primary fund flow will be Channel 1b through CWA.

Channelling of Development Partners' funds will be as follows:

- Development Partners will confirm their precise contributions within the bilateral agreements between MoFEC and the individual Donors.
- Development Partners will inform MoFEC of their annual contribution not later than November for the next fiscal year based on the annual work plan agreed in October.
- Donor contributions will be channeled to special foreign currency accounts at the National Bank of Ethiopia (NBE) for each financing partners.
- Development Partners contributions are transferred from a Foreign Special Account into the Consolidated WASH Account (CWA) administered by MoFEC and
- Flow only through Channel 1b to the governmental WASH implementing agencies at federal level, through BOFEC to regional implementing agencies and to WoFEC.

Channeling of funds will be aligned to the Government's financial management system. Government contributions from federal level are channeled to BOFEC either as SPG or block grants. In both cases the regions decide the amount of money to be used for WASH. The budgeted amount at regional level will either be transferred from BoFEC to regional implementing agencies or WoFEC.

At the Woreda level WoFEC manages the WASH fund. WoFEC will open a special account for WASH funds. In Woredas where CMP projects are implemented. The WoFEC will also open another account dedicated for CMP or can outsource the channeling of the fund to a service provider (Cooperative Bank, MFI). In either case the responsibility for managing Program funds will be WoFEC. See fig 20 below for flow of funds

b) Channeling of WASH Funds outside of CWA

b1) Channeling of WASH funds through BoFEC

Some donor investments that are not channeled through CWA are made at the regional level through BoFEC. Fund channeling at regional level will be captured by BoFEC as WASH fund and shall also be included in the quarterly financial reporting in a separate report from CWA.

b2) Channeling of WASH funds through implementing agencies

Some donors channel WASH funds through the implementing agencies like sector ministries and bureaus.

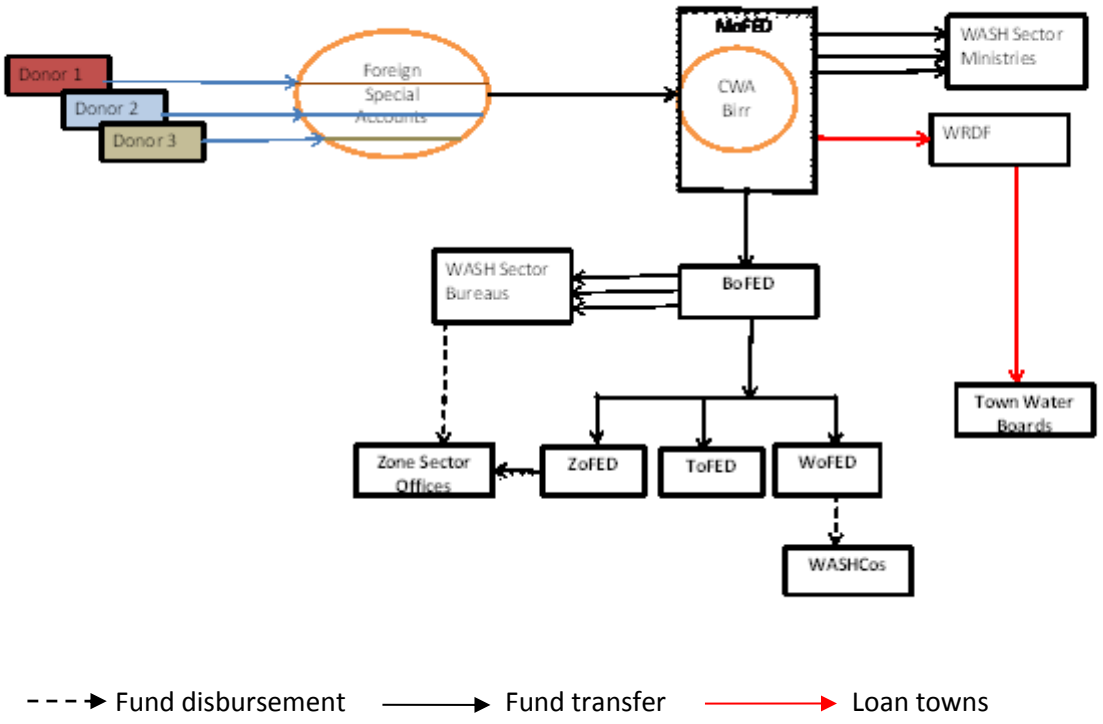


Figure 12-2: Program Fund Flows

However, they should be reflected in the WASH resource mapping, plans and reports and included in the *Composite WASH Budget.* The NWCO shall design a budget tracking system and collect annual disbursements of the WASH funds and report to MoFEC.

b3) NGO WASH funding

NGO funds do not flow through government channels and are not part of Program funding. These funds may be used at community level with some contribution from woreda, regional and national levels. NGO investments are captured in regional and woreda resource mapping and included in the consolidated WASH budget. The WASH allocation and their outputs/results are included in WASH reports. Information on NGO plans, budgets and expenditure on WASH activities should be reported to the NWCO through regional WASH coordinators and by the Water and Sanitation Forum.

c) Channeling of CWA Funds

c1) Fund Channeling through MoFEC-BoFEC- WoFEC- ToFEC

Step 1: From Development Partners to the Consolidated WASH Account

Step 2: From the Consolidated WASH Account to Federal and Regional Implementing Agencies (IAs)

On instructions from MoFEC, the National Bank of Ethiopia transfers funds:

- **Federally** – into accounts opened for the three sectoral ministries (WPMUs) and MoFEC for federal-level expenditures and for the NWCO into accounts opened at the MoWIE and to WRDF for the loan component
- **Regionally** – to BoFECs for onward transfer into accounts opened for:
  - the RWCO into accounts opened at regional water bureaus (for joint Program support)
  - the three sectoral Bureaus and BoFEC (for WPMU-specific expenditures)

a. Fund Transfer from WRDF to Town as Loans

WRDF receives transfers from MoFEC for the loan component: Transfers payments to special accounts of town water boards and matching funds from utilities, city administration and regions will be transferred to special account in WRDF

Transfers from BoFEC to regional IA and Zones/Woreda Finance Offices

Regional /Zonal Sector Offices **-** BoFEC disburses funds to: a) Regional Sector Bureaus for WASH expenditure and b) Zonal Finance Offices for WASH expenditure
Regional Water Bureau can delegate WASH activities to be effected by a stronger Zonal Sector Offices. The budget will be disbursed from regional water bureaus.

- **Town/Woredas** - BoFECs also open accounts for, and disburses funds to WoFECs for WWT expendituresParticipating towns (for town water supply and sewerage projects and other WASH activities)
- **CMP funds through WoFEC**
  BoFEC will transfer WASH funds directly to WoFEC's account. In this case WoFEC will open a special account dedicated for community WASH investment managed by the Woreda Finance Office. WoFEC disburse WASH funds to communities after approval by WWT from the special account.

C2) CMP Fund Transfers through Service Providers

WoFECs, in agreement with the WASHCO, can decide to channel funds through a service provider. If a service provider is used, WoFEC, in agreement with the community, will enter into an agreement with the service provider, subject to the prior approval of BoFEC to ensure compliance with GoE's public financial management rules.

Disbursements to the service provider will be subject to prior approval from the WWT and WoFEC. The service provider will submit monthly disbursement and utilization reports to WoFEC. Original copies of relevant financial records will be maintained by the WoFEC. WoFEC will report quarterly to BoFEC on utilization of WASH funds, including funds for CMP projects, with a copy to the WASHCO. Detailed arrangements will be agreed during detailed planning with the community based on CMP financial guidelines.

13.9 Fund Allocation

WASH funds are allocated to implementing agencies as follows:

Federal level

The Annual (National) WASH Plan and Budget specifies the amount of WASH funds to be budgeted at the national level for:

- Expenditure by the NWCO and by each of the four national WPMUs
- Expenditure on trans-sector national WASH activities
- Loan component to be transferred to Water Resources Development Fund

It also specifies the total amount to be allocated to the regions. Allocation among regions is prescribed by the government's Block Grant formula and annual WASH plans**.** Expenditures on trans-sectoral national WASH activities are those expenditures which are allocated for WASH integration and coordination and those that are expended for activities like JTR, MSF and other multi sect oral and monitoring activities.

Regional level

Annual Regional WASH Plans and Budgets specify the amount of WASH funds to be budgeted at the regional level for:

- Expenditure by RWCOs and by each of the four regional WPMUs
- Expenditure on trans-sector regional WASH activities

Regional level trans-sectoral expenditures are those expenses that are expended to facilitate regional level inter sect oral WASH activities like coordination, monitoring and joint intervention activities.

It also specifies the total amount to be allocated to the woredas and towns/cities. Recommendation for allocation among woredas and town/cities are made by the Regional WASH Steering Committee:

- On the basis of need/priority established in approved town/woreda Annual WASH Plans
- Within the framework of the Regional Strategic WASH Plan

In allocation of regional WASH funds to the woredas, the RWSC shall try to follow the policy of 30% for hygiene and sanitation and 70% for water, but the actual annual budget at woreda level will be defined based on needs identified during the annual planning process.

Woreda

The WWT's Annual WASH Plan and Budget specify the amount of funds to be budgeted at woreda level for:

- Expenditure on intersectoral WASH activities
  - The total amount to be allocated for WASH services investment with disaggregation for water, sanitation and hygiene
  - The community water supply investment divided into CMP and WMP components

Towns

The City Council's Annual WASH Plan and Budget specifies the amount of funds to be budgeted for:

- Inter-sectoral WASH activities
- The total amount to be allocated for water supply investment

13.10 Budgeting

Budget Preparation

Budgeting takes place based on forms and procedures designed by MoFEC. Sector offices from federal ministries to woreda offices will be responsible for requesting WASH budget. It is based on a comprehensive resource mapping of all resources available to WASH at the given level, i.e. federal, regional, zonal or woreda/town. The basis for annual WASH budgets is approved annual plans, prepared at each level according to a common planning format provided by the NWCO.

WASH budget preparation will follow the government budget preparation schedule. The budget approval process for WASH budget will also follow existing government regulations. While the Development Partners' component is budgeted at federal level the government contribution will be budgeted at respective institutional levels of the government.

Budgeting at Federal Level

The budgeting process begins with the announcement of MoFEC of the ceiling for WASH budget. Based on the ceiling and the approved annual WASH plan the federal ministries of Water and Energy, Ministry of Education and Ministry of Health will identify the budget requirement for federal management and federal implemented WASH activities based on the agreed "Consolidated annual WASH plan". The four sector ministries submit their annual WASH budget to MoFEC. The NWSC through NWCO will coordinate the budget preparation process of the four sector ministries. The NWCO budget will be allocated through the MoWIE.

Regional Level

The NWSC through the NWCO will inform regions the WASH targets for the fiscal year. MoFEC will provide the Regions with indicative CWA budget ceilings. RWCO will prepare regional annual WASH plan based on the regional

targets, woreda and town WASH plans and regional sector bureaus plans. This will be the basis for the budgeting process. They will consolidate the regional plan based on aggregated woreda and town plans including regional WASH activities. The regional sector bureaus then will prepare their annual budget request and submit to BoFEC. BoFEC will review the budget request based on available resources from CWA and block grants and propose annual budget for the sector bureaus and it will be approved by regional council. The RWCO budget will be allocated through the Regional Water Resource Bureau.

Woreda Level

The WWT will prepare annual WASH plan which will eventually be approved by the Woreda Council. The basis for annual WASH plans is the woreda WASH targets from the region. The woreda sector offices will prepare their WASH annual budget based on the budget ceilings provided by WoFEC. The sector office budgets will be submitted to WoFEC. The WWT will coordinate the budget preparation process. The Woreda WASH budget will be approved by Woreda Council.

Town Level

In towns there are two major WASH structures; Water Utilities and WASH Technical Team. Their activities are coordinated by the City council. The budgeting process follows the same pattern. The town water board (responsible for the water utility) will prepare annual capital budget for water supply improvement and will be submitted to town finance and economic development office. The health and education office will also submit their annual budget to town finance and economic development office. The town finance and economic development office will prepare the aggregate WASH budget and submit to City council for approval.

13.11 Consolidated WASH Account at federal level

The disbursement procedure for Consolidated WASH Account will be as follows:

- Donor's disbursement will be made biannually. Condition for first disbursement is the approved Consolidated Annual WASH Plan. For the first disbursement of the fiscal year, Development Partners will advance at least 50 percent of their expected annual commitment.
- The Development Partners' initial deposits into the program Foreign Currency Special Accounts with National Bank of Ethiopia constituted their advances to the Program.
- Contributions will be converted into Birr and transferred to the Consolidated WASH Account managed by MoFEC.
- MoFEC disburses funds, as advances for the first six months of the Program, into WASH accounts established for implementing agencies at the federal and regional levels.
- A second payment will be made in December, following submission by MoFEC in October of an Interim Financial Report setting out details of eligible expenditures in the first quarter, the balances in the relevant accounts (including unspent funds carried forward from the previous year), and the work-plan and cash-flow forecast for the second and third quarters. The condition for disbursement is utilization of at least 50% of the first transfer.
- MoFEC continues, on the same basis, to make biannual replenishment requests to the Development Partners six weeks in advance of scheduled expenditures.
- Upon receipt of replenishment from the Development Partners, MoFEC immediately transfers funds to the Implementing Agencies.

MoFEC's requests are supported by Interim Financial Reports for the previous quarter.

Fund requests should always include financial reporting. The process of reporting is illustrated in the figure below.

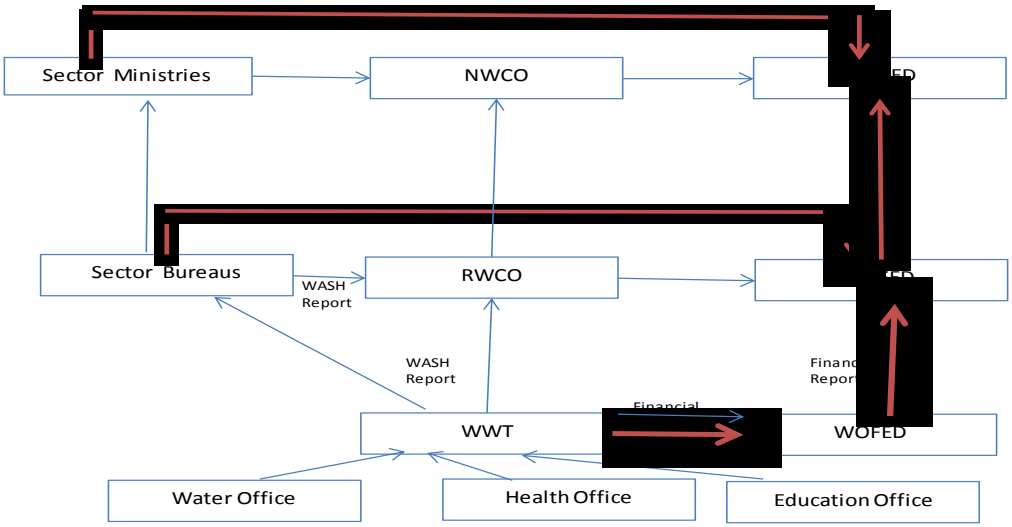


Figure 13-3: Financial reporting

Implementing Agencies' Accounts

MoFEC's and BoFECs' disbursement of funds to the governmental implementing agencies follows the same pattern. Initially, each implementing agency receives a 1st quarter and 2nd quarter advance based on its approved Annual Work Plan and Budget. At the end of 1st quarter the agency prepare a report on expenditures together with, and a request for, replenishment to cover the amount budgeted for the 3rd quarter less the amount of unexpended funds from the 1st quarter. This "roll over" system means that implementing agencies always have in hand their budget for the upcoming quarter.

Request/reports are vetted and approved at a higher level in each instance and consolidated into the Quarterly Report and Request for Replenishment presented by MoFEC to the Development Partners.

Disbursements of Loans to Towns

Disbursement of loans to water utilities will not follow quarterly period. The cash transfers from WRDF to utilities will be dependent on procurement plan. However, utilities are required to submit quarterly financial reports for WRDF to review cash flow situation and plan for next disbursement. Detailed disbursement schedules will be agreed between the WRDF and the utility.

Payments to WASHCOs

Payment to WASHCOs will follow similar process regardless of the fund channeling (WoFEC/Service Provider like cooperative bank or MFI). After signing the Funding Agreement WWT chairperson writes a letter to WoFEC in order to notify the signatories of the WASHCO and to release the first installment to WASHCO. The WASH accountant opens sub ledgers for all participating WASHCOs with in the cash account.

The first installment shall be made available to WASHCOs within three weeks from the date of signing the Funding Agreement. All payments to WASHCOs will be approved by the WWT.

Second installment of payments will be paid when 80% of the first installment is expended and evidence for transaction is submitted to the CMP supervisor.

The receipts and transaction evidences shall be submitted by WASHCOs to the CMP supervisor and he will work with WASHCOs to clean up all receipts and documents. Then the CMP supervisor will submit the documents to the WASH accountant.

If the WASH accountant does not approve the documents then he will give it back to the CMP supervisor for his follow up and correction.

13.12 Bank Accounts

Bank Accounts

Program bank accounts and the process flow and the purpose of the accounts, are described below:

- MoFEC opens foreign currency special accounts at the National Bank of Ethiopia (NBE) for each financing partners. In addition, it opens Birr accounts into which funds from the donors' special accounts will be converted and deposited. The Birr accounts serves as a consolidated fund for all donors, MoFEC will be responsible for the day-to-day management of the special accounts and the pooled Birr account.
- A Bank Account, which will be operated by two official signatories, will be opened in the name of OWNP at each implementing ministries and WRDF.
- MoFEC at the federal level will transfer funds to the Federal implementing ministries including WRDF and BoFEC bank accounts
- The regional BoFEC will open bank accounts for each of the Bureaus of Sectoral Offices to be operated by joint signatures of BoFEC officials
- BoFEC also open account and disburse the funds to the towns, and Woreda Finance Office bank account, based on approved WASH plan.
- Each woreda will open Woreda Bank Account, which will be operated by joint signatures of WoFEC officials
- Woredas choosing to implement CMP modality will open a "community water investment account" to be operated by joint signatories of Woreda officials
- Each town will open Town Bank Account, operated by joint signatories of the town.
- Each town water utility open special bank account, which will be operated by joint signatories of the utility.

Accounts to be opened at regional and woreda levels are solely dedicated for WASH funding and operations.

13.13 Financial Reporting

The objectives of financial reporting by the public finance management entities (from federal to woreda level) are to provide information about the program that is useful to participants for accountability purposes and for decision-making purposes.

Financial reports will be prepared and submitted quarterly. Financial reports will be prepared by WoFEC, BoFEC and MoFEC respectively. WoFEC reports to BoFEC and BoFEC reports to MoFEC. MoFEC compiles and reports to Development Partners.

The financial reporting at each level shall facilitate the distinction of budget utilization to the sources of the fund. For this purpose financial plans will be prepared at each level indicating the source of finances. The financing plan then will be the basis for financial reporting and budget control.

The financial reports will be in line with the financial management system of the GOE and will be complemented by source and use of funds.

The quarterly financial reporting will include the following: trial balance, revenue reports, expense report, receivable report, payable report, monthly bank reconciliation statement

Additional statements to satisfy the One WASH Program are financial reporting requirements:

Statement of Special Accounts

This is a statement showing summary of the movements of each of the financers' special USD bank accounts.

13.14 Fixed Assets

All assets purchased for the Program shall be expensed upon purchase. This is important because, the program is run using pooled funds that will need report of all expenditures as and when incurred.

Fixed assets register would be maintained as per the FGE manual with all the necessary details to know about the location and user of the assets.

An identification number should be given to each of fixed assets, as per the government policy, with indicators showing the assets belong to the One WASH Program.

13.15 Preservation of Financial Documents

According to Financial Documents Preservation Guideline No 5/1999 of MoFEC, financial documents shall be preserved for ten years from the date they were created or up to two years after the audit by the Auditor General is completed, whichever comes last. For further detail please refer the guideline.

Documents refer to all the ledger cards, registers and supporting documents. Program documents shall be kept separately and shall be filed in a way that makes referring to the documents very easy. The filing system should enable auditors and anyone who is authorized to review Program documents to easily and systematically trace the required documents and information.

13.16 Internal Controls

To satisfy the effectiveness and efficiency of the Program's financial management system to the Government and Development Partners, it is essential to develop or strengthen adequate internal control systems at each and every level. Internal control should be used to support the Program in achieving its objectives by managing its risks, while complying with rules, regulations, and policies of the Program. The Program should therefore make internal control part of program management and integrate both in its overall governance system.

The Program should determine the various roles and responsibilities of different units and personnel with respect to internal control.

The Program should particularly introduce control mechanisms including requirement for approvals, authorizations, verifications, reconciliations and segregation of duties. Program management should foster an organizational culture that motivates members of the program to act in line with risk management strategy and policies on internal control set by the Government of Ethiopia to achieve the program's objectives.

The management and key personnel of the Program should be sufficiently competent to fulfill the internal control responsibilities associated with their roles.

Controls should always be designed, implemented and applied in a response to specific risks like procurement and disbursement. Internal control principles of the Program should be fully understood and correctly applied by *all relevant parties.*

Safeguards at WASHCO level

- The community signs a funding agreement which specifies the obligations of the community.
- For the payment to be released from the bank/MFI, two signatories from WWT shall authorize based on recommendations of the CMP supervisor on the progress of the work
- The artisan and the WASHCO shall prepare and sign jointly progress reports for payment release to be effected and their report shall be verified by woreda water office staff
- The WASHCO shall submit expenditure documents for 80% of advance or previous payment for another request to be effected.

13.17 Auditing

According to the Ethiopian Constitution, the Office of Federal Auditor General (OFAG) is responsible for carrying out the audit of all the financial transactions of the federal government and subsidies to the regions. The whole program finance will be audited by OFAG or competent auditing firm assigned by the OFAG.

Internal audits will be carried out in line with the internal audit guidelines of the GOE. The results of internal audits will be made available to external auditors. The implementing agencies are responsible for follow up of audit recommendations.

External audit will be carried out at the end of the fiscal year. MOFEC and Development partners will agree on the TOR and schedule of the audit. MoFEC will facilitate the audit and that the report is provided to the Development Partners. The audit will be conducted by an independent certified auditor. The audit report will include an audit of all program bank accounts, and will specifically identify and audit the pooled fund eligible expenditures.

In addition to periodic joint spot checks on high risk areas development Partners may request a performance related audit to be carried out by an external auditor. The Partners will provide adequate resources for such a purpose. The selection of the auditors and timing for such audit will be done in close collaboration between MoFEC and the Development Partners. The development partners and GOE will jointly agree on the TOR. Based on the outcome of such audit, the Development Partners may convey to GOE any corrective measures they consider necessary to be undertaken.

An independent evaluation of the performance of the Program which include will include an assessment of the adequacy of accounting and internal control systems to monitor expenditures and other financial transactions and ensure safe custody of project-financed assets; will be carried out based on the advice of the MoFEC at periodic intervals. The evaluation reports will be submitted to the Government of Ethiopia and to the Financing partners for review and comments.

Audit reports must include a summary of the main audit procedures used for planning the audit, evaluating the internal control structure, checking of the figures included in the financial statements and other reports subject to audit, and the evaluation of the compliance with terms of the applicable agreements, laws and regulations.

Annual external financial audits will be planned and coordinated by the Program Steering Committee and managed by the NWCO. The auditor will present their report and management letter to the Steering Committee, who will be responsible for taking follow-up actions.

13.18 Taxation

National WASH Steering Committee should identify WASH investment areas where tax and custom privileges to the program can bring reduction of costs and can enhance effectiveness of the Program. The priority WASH investment areas for tax and custom privileges should be submitted for the approval of the Government of Ethiopia as soon as possible in order to gain the advantages for the program.

13.19 Per diems

Effective program implementation can only be assured if implementing agencies can regularly conduct supervision of works, monitoring of community activities and periodic consultation at all level. In order to achieve these motivated and competent staff at all level should be maintained. One main reason for lack of motivation is the occurrence of different per diem rates within the same program. Therefore, the National WASH Steering Committee should establish uniform per diem rates across the program and get approval from appropriate authorities.

14. Procurement and Contract Management

14.1 Introduction

The Program will make use of the government procurement system and procedures and established procedures for contract management. Ministries, regional bureaus and woreda offices will use standard bidding and contract documents that comply with government rules and regulations[77] for procurement of works, goods and services.

From experience, procurement on a piece by piece modality has caused delays in accomplishing planned activities. This modality will have to change to bulk purchasing of important items such as electromechanical equipment, pumps and store at federal level to be issued on request from projects and continue to replenish the items. This will require government commitment to avail foreign exchange money on demand and the establishment of a central procurement facility with adequate and qualified personnel.

Packaged contracting has already been tried within the WASH sector in Ethiopia with variable results – depending on the capacity of the client or procuring agency to put together attractive packages for the private sector and then to effectively manage the contract throughout its implementation. The packaging of the different contracts into one has a number of advantages. The first is to have a joint plan of the project, including all aspects of the project execution, drilling, construction, supply order and installation of electromechanical parts, as well as capacity building, so a high level of project organization is achieved." With a better integration of planning, the different elements of the project should be delivered more timely.

The outcome in the course of OWNP program review and updating process reinforces the immediate need to quickly increase the focus and investment in procurement contracting and contract risk management capabilities at all WASH stakeholder level from federal to Woreda. Delay in transfer and reimbursement of available funding and lack in procurement contracts management process capabilities such as poor procurement, contracting etc has been related to overly bureaucratic or inadequate procedures and poor system design. These are, to a greater or lesser extent, holding up programs and achievement of targets.

14.2 Procurement Methods

The Program will follow the Procurement Proclamation issued by the Federal Government (January

12, 2005) and the subsequent Procurement Directives released by MoFEC. At regional level the procurement code is enacted by regional governments and the procurement directive adapted to each Region based on a model prepared by the Federal Government.

According to the Government's policy to decentralize and devolve responsibility, WASH procurement is carried out, as far as possible, at the level where the goods are utilized and the services delivered to build capacity for local procurement.

The procurement plan is an essential component of annual WASH plans. Training and technical assistance will be available to assist regions, towns, woredas and community planners. Procurement plans are consolidated by WWTs and regional and federal WASH Coordination Offices. Procurement at all WASH cost centers will be reported quarterly.

Procurement requires quality assurance (QA). QA for goods can be undertaken in collaboration with the Ethiopian Standards Authority (ESA). The Ethiopian Water Technology Institute (EWTI) can also contribute to the development of standards, BOQs and specifications for works, goods and services.

[77] FDRE, User's Guide for Simple Requests for Quotations and Local Purchase Order. January 2006, and;
FDRE, Procurement services and contract administration – Amharic version. Addis Ababa, July 2002 EC.

The Program will recognize the following procurement methods:

Table 14-1: OWNP Procurement Methods

Method	Procurement by/through
Government of Ethiopia	GoE and CWA
Region managed projects	GoE and CWA
Woreda managed projects	GoE and CWA
Community managed projects	WASHCOs
NGO projects	NGOs
World Bank	GoE and CWA
Other partners	Respective partners
Self- Supply	Households and groups

The methods to be followed for the procurement of works, goods and services will be specified in the annual procurement plans at federal, regional/city, woreda/town and community levels.

Packaging of services, works and goods is advantageous in terms of cost and time saving, in the same way procurement of works and goods can be combined in a turnkey contract as is being done by the WRDF in some urban water supply schemes. Where funds are available, longer-term framework contracts for services and works can be considered, as can combining procurement of pumps and spare parts in one tender.

Where the CMP approach is used, service providers at woreda level can be procured for services or construction work at community level with technical support from kebele and woreda levels as required.

Woredas and towns may also decide to delegate larger procurements to regional bureaus and regional governments, respectively.

Procurement guidelines have been prepared by the Ethiopian government, the World Bank and African Development Bank, and attempts have been made to coordinate and align these guidelines, which are commonly used for procurement and contact administration in the WASH sector. Ministry, region, city and woreda procurement staffs are familiar with the content of these guidelines, however capacity limitations in the application and use of these procedures have often been a major cause of delays in implementation of projects in the WASH sector. Furthermore, the approving committee at the federal level is another bottleneck. The committee now formed may not have the time to commit to decide and the necessary consultation with local companies on the products and systems.

Steps to improve procurement processes:

1. Carry out an unbiased and comprehensive assessment of the current procurement contracts Management processes and related capabilities (e.g. Strengthening Federal Level procurement staffs, at region and Woreda level, review of procurement process, Local contractor and Consultant capacity etc.), and then evaluate gaps between the current state and an agreed-upon desired level of capability and performance.
2. Identify immediate short-term actions to address urgent control improvement needs and put the necessary resources behind those short-term actions.
3. Make clear overall strategic and operational objectives and performance expectations for the government procurement contracts management process at all level of program implementation approach, CWA, NGOs, CMP etc... Without such a vision and objectives, it is unlikely that the desired level of performance, control and capability will be achieved.
4. Design, develop and implement strategies and detailed procurement plan, integrated action plans to achieve the desired levels of performance and process maturity, actions that address each and all of contracts management capability, and cover the immediate, middle and longer term horizons (typically current to three years GTPII period).

5. Higher decision-maker management support for the execution of the short-term as well as mid to longer-term improvement plans through facilitation of tax breaks for import of critical WASH plant and equipment, where these are not manufactured in Ethiopia to the required specifications. Such equipment includes water drilling machines, pumps, generators, vacuum trucks, laboratory equipment, etc.
6. Make appropriate mid to longer-term investments in procurement contracts management process capabilities

14.3 Program Procurement Requirements

The Program will require the following types of procurement:

Services

1. Service providers, including artisans, at woreda level providing the following services:
    - Planning and design of water supply schemes
    - Sitting and surveying
    - Post-construction support to communities
    - Community mobilization and training of WASHCOs
    - Training water supply caretakers and mechanics
    - Financial services
2. Consultants or firms at regional or national level to:
    - Build capacity of woreda WASH teams, prepare annual, strategic and procurement plans
    - Conducting hydrogeological investigations including borehole siting and drilling supervision
    - Carry out study and design for water supply schemes
    - Conduct studies for rehabilitation and expansion of water supply schemes
    - Supervise construction, rehabilitation and expansion of water supply schemes

Works

1. Service providers constructing:
    - New hand dug wells and installation of pumps
    - New spring capping
    - Rehabilitation of existing point sources
    - Construction/rehabilitation of institutional sanitation facilities
2. Drilling contractors at regional or national level for:
    - Drilling shallow boreholes and installation of hand pumps
    - Drilling deep boreholes, pump installation and construction of distribution system
3. Contractors at regional level or artisans at woreda level for:
    - Rural piped gravity schemes from spring sources
    - Rural piped schemes from spring sources with motorized pumping
    - Rehabilitation and expansion of water supply schemes
    - Construction/rehabilitation of institutional and public sanitation facilities
    - Rural piped schemes supplied from deep boreholes (excluding drilling)

Goods

- Service providers, including artisans, at woreda level supplying: Hand pumps and spare parts, Construction materials, Sanitation materials

- Region-based suppliers supplying: Tools for HDW contractors, Office supplies, Hand pumps and spare parts, Submersible pumps with accessories and spare parts, Generators with accessories, Pipes and fittings, Sanitation materials, Desludging equipment, Sewerage works (only in Addis Ababa)

Procurement of design and construction supervision works by service providers licensed at woreda level will be done at woreda level by the Woreda Finance Office in collaboration with the Woreda Water, Health and Education offices as required. Design and supervision of up to 4-5 water supply schemes or construction of latrines in a group of institutions in one kebele can be packaged and offered as one contract in order to take advantage of economies of scale.

14.4 Program Interventions

The Program will support the provision of qualified needs-based training to relevant staff on public procurement and contact management as a practical training using actual cases.

Due to its critical importance for the timely completion of Program activities, procurement and contract management will be the subject of periodic reviews by independent evaluators. Follow-up compliance with recommendations from these reviews will be important for ensuring Program effectiveness.

As small contractors are expected to bid for contracts up to a threshold of USD 100,000, the Program will support the training of small contractors at regional and city in collaboration with contractors' associations to improve their ability to successfully bid for these contracts. Contractors and consultants are also expected to perform ethically in accordance with a mutually agreed code of conduct.

15. Program Monitoring and Review

15.1 Introduction

Due to the size and scope of the Program and its new elements, procedures and organizational arrangements, it is essential to establish during Phase II a monitoring program to evaluate the planning, learning, implementation and evaluation process through:

1. Monthly and quarterly progress and financial reports from kebeles, woredas/towns[78], regions/cities and zones using WASH MIS
2. Status/issues reports by the NWCO and WASH Coordinators to quarterly meetings of the One WASH Steering Committees at federal and regional levels
3. Semi-annual Joint Technical Reviews (JTR) and follow-up actions track the level of implementation of the undertakings agreed in the MSF
4. Annual Multi-Stakeholder Forums (MSF) and follow-up actions at national and regional level
5. Infrastructure Audits/Sustainability Checks and follow-up actions
6. Joint supervision visits to Program sites
7. TA and hardware support to strengthen Program monitoring and reporting systems at all levels
8. Service delivery surveys, assessments, research and evaluation for advocacy
9. Learning exchanges by preparing an annual calendar of events

Given the huge amount of monitoring, learning and knowledge sharing requirement from such national and important social service it is mandatory to strengthen the MIS system in the MOWIE from the present team level organization to a directorate level just like MoH. Raising the profile of M&E organization will also enhance data quality, system development at all level (kebele to federal level) and strengthen delivery of planned activities.

15.2 Key Performance Indicators

The Program's main instruments for monitoring, verification and impact assessment consist of a results framework and key performance indicators. The Program's Results Framework contains outputs, outcomes, indicators and impacts for each Program component and for the Program as a whole. The Program's results framework is presented in **Annex 6.**

Key performance indicators (KPIs) will have the following characteristics:

- Related to important policies, issues and objectives
- Clearly defined and easily measurable and consistently applied
- Few, manageable for regular reporting and provide required information for decision-making
- Allow performance to be assessed regularly and tracked over time to inform key decisions

The following key performance indicators (KPIs) will be used in the Program are included as **Table 15.1**.

[78] Numerical Monthly reports from kebeles, woredas and towns may be done by mobile phone or if mobile system is established from the server.

15.3 Reviews and Reporting Process

15.3.1 Review

Reviewing of the program progress at all operational levels periodically is part of the monitoring process. For this reason, there should be a quarterly, biannual and annual review program for WASH at woreda, regional and federal level respectively to help the program understand on the development levels of the action plans, the challenges and document important learning. The outcome of these reviews will be an input or discussion points for the progress meeting and reporting or timely sharing of information and exchange of data with stakeholders at all levels.

15.3.2 Progress Meetings and Reporting

Program progress meetings will be held as follows:

- The KWT will hold quarterly and annual Program progress meetings with WASH stakeholders.
- The WWT will conduct quarterly and annual Program progress meetings with Woreda WASH stakeholders including Kebele representatives.
- The RWCO will conduct biannual and annual Program progress meetings with regional WASH stakeholders including zonal and woreda representatives.

The NWCO will conduct annual Program progress meetings with national WASH stakeholders, including regional representatives.

The diagram below shows the flow of reporting in the Program as well as existing information flows between sector ministries, bureaus and offices. Arrows indicate direction. (Fig. 8.1)

The Program will ensure that these indicators are understood and used by relevant parties and are contained in the consolidated WASH progress reports to be generated at all levels.

15.3.3 Reporting from Kebele to federal level

Program progress reports will include both physical and financial status. Monthly and quarterly Program reports will show physical progress against planned activities and/or outputs, while the annual report will show achievements in meeting annual targets, i.e. output and outcomes

- The KWT submits monthly[79], quarterly and annual WASH progress reports to the WWT
- Woreda (WWT) submits monthly[80], quarterly and annual WASH progress reports to Zone/Region
- Zonal WASH team Submit quarterly and annual WASH progress report to RWCO
- Implementation partners (CSO) submit monthly, quarterly and annual consolidated report to RWCO
- Region (RWCO) submits monthly, quarterly and annual WASH progress reports to the NWCO
- Development partners submits quarterly and consolidated annual reports to NWCO
- The NWCO submits monthly, quarterly and annual WASH progress reports to the NWTT and through it to the NWSC. The DAG will receive copies of these reports from the NWCO.

[79] Monthly reports from kebeles may be done by telephone.
[80] Monthly reports from woredas may be done by telephone.

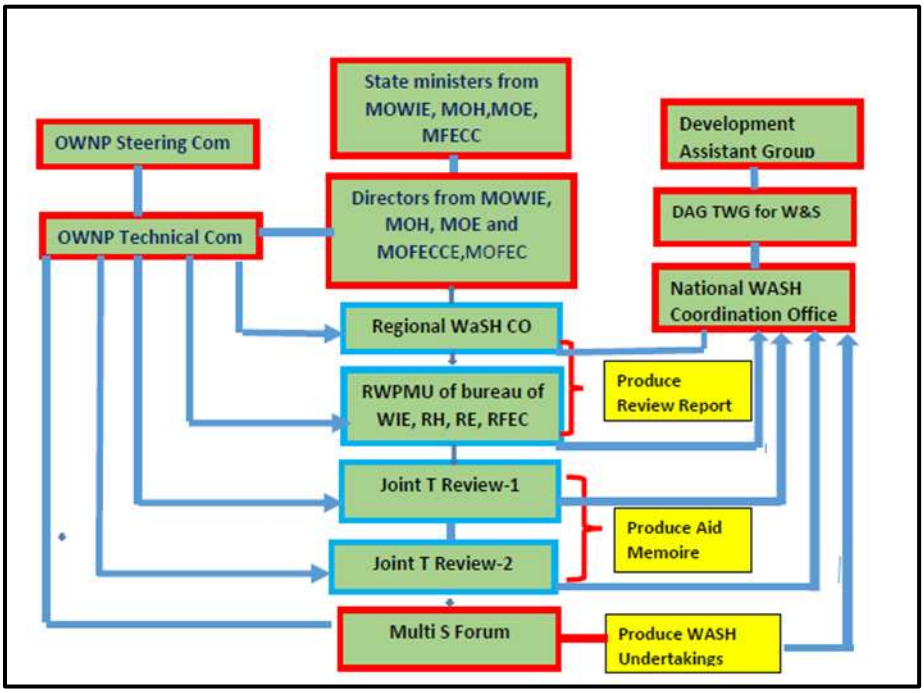


Figure 15.1-4: Reporting at federal level

Fig 15.1:

15.3.4 Reporting at federal level

The NWCO and Technical Teams at national and regional/city levels in collaboration with independent agents will carry out Program monitoring and reviews as follows:

- The NWCO will receive and compile progress and budget utilization reports from the regions, bilateral organizations, CSOs and cities for presentation to the NWSC and provide feedback to the regions and cities on issues requiring attention from the federal level.
- NWCO and in regions, towns and woredas by ensuring that sufficient staff are in place, training M&E staff in monitoring procedures and responsibilities, data management, reporting and related subjects. Training will be followed up by on-the-job coaching and mentoring.
- Technical Teams at national and regional/city levels will be responsible for following up on implementation of the recommendations of the JTR and MSF and submitting a quarterly status report to the NWCO commencing within three months of each JTR/MSF.

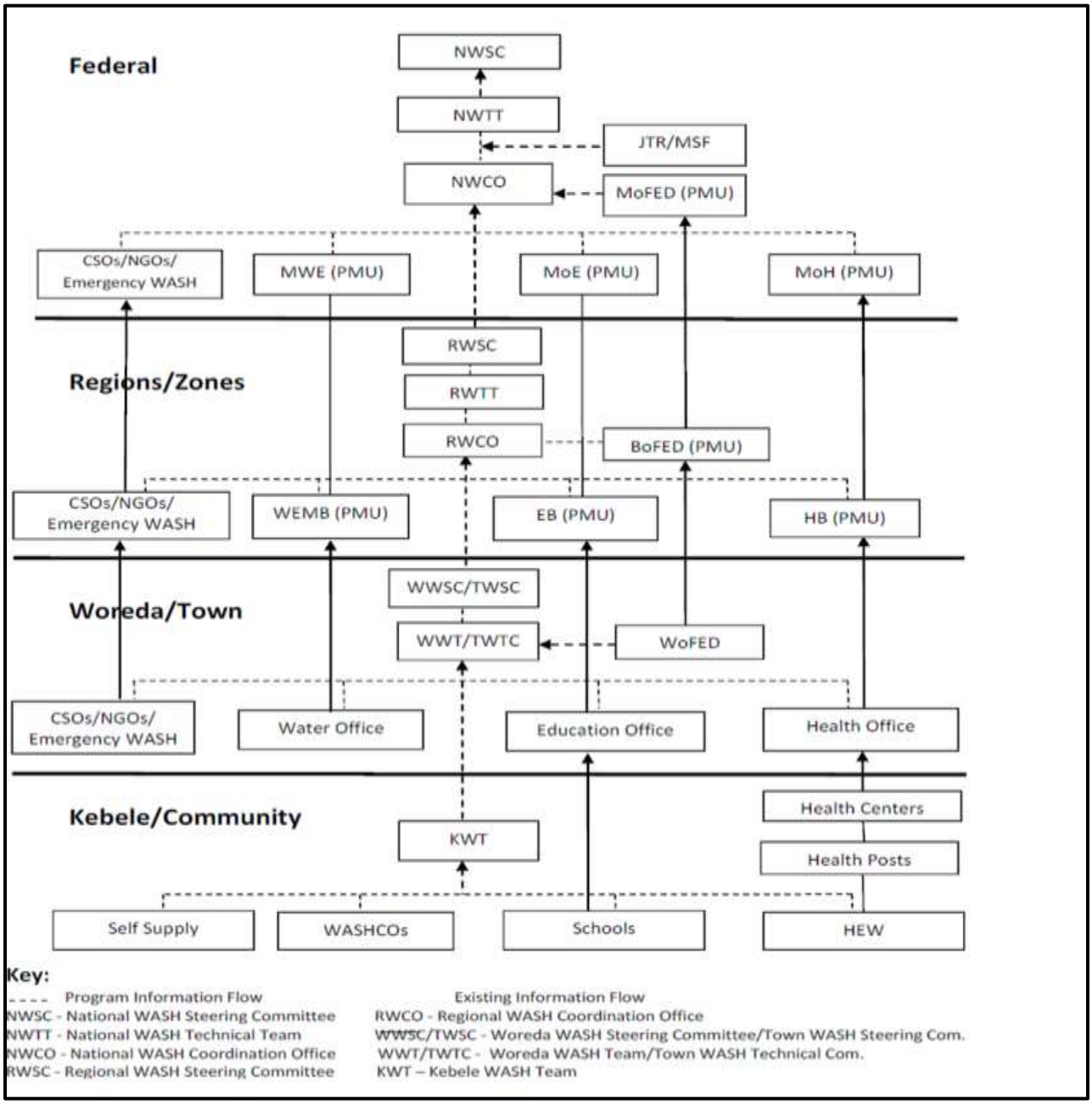


Figure 15.2-5: Reporting Routes from Kebele to Federal levels

15.4 Mobile Technology for Transmission of Data and Information

The National WASH Inventory (NWI) represents a large and important step forward in the understanding of the water supply and sanitation situation in Ethiopia. The NWI is a standard, national survey of WASH coverage in Ethiopia. The NWI 1 was a major undertaking of the MOWIE.

NWI2 is expected to be finalized during Phase II of OWNP. It will be using the experience gained in conducting WASH inventories in 2010-11 (2013-14 EFY) using mobile phones to transmit and collect information.

The NWI 2 will involve as has been done for NWI 1 all community water schemes in rural areas and all urban water supply systems in the regions where each water point will be identified according to its coordinates and

Information collected, including the number of users in woredas and kebeles in the country. Information on WASH in schools and health institutions will be also collected. NWI 2 results are expected to be officially released by MoWIE, which is currently the chair for OWNP Steering Committee to WASH stakeholders during the Phase II period.

The continued rapid expansion of mobile technology in rural and remote areas of Ethiopia creates unique opportunities for applications that support transmission of near real time information. This development opens up the possibility for community level monitoring using cell phones.

To harness this potential, the Program will support:

1. A One WASH website with access to current WASH plans, budgets, progress reports, WASH inventory data, information on upcoming events and relevant documents and maps.
2. Training in use of GPS devices and PDAs/tablets for generating and storing WASH data
3. Expanded internet connectivity for woredas
4. IT service and troubleshooting contracts
5. Training in use of MS Excel for data entry and reporting
6. Dedicated links to MIS and databases in MoWIE, MoH, MoE and MoFEC

These services will be provided by a firm procured through NCB and monitored and supervised by the NWCO. Experience from implementing the NWI in Somali Region using mobile phones and software for data entry and transmission will be very useful in this regard.

Data collected will be stored at central location with possibilities of access by all WASH actors and researchers. The data henceforth will be updated at least quarterly as fresh data is compiled as reported from the source

16. OWNP Phase 2 Completion Program Plans and Costs and Budget

16.1 Program Planning Process

The Program planning process for Phase 2 is in many ways similar to the process used for Phase 1. The term "planning process" is used again since a definitive "plan" cannot be made without further iterative steps, as explained in the **Sub-section 7.3**.

The Program planning process is based is based on the flow diagram **Figure 7.1** in **Sub-section 7.3**.

Planning assumptions are described and listed in **Annex 1** and include population projections, beneficiaries, unit rates per technology type and per region. The annex also includes summaries of the unit rates and population served.

In Phase II, Unit costs are calculated using averages from regions, international organizations, CSOs determining the unserved population in each region. The unit cost has also considered regional variations, accessibility, capacity, and other relevant parameters.

16.2 Spread sheet tool

An interactive spread sheet tool has been developed to allow any combination of technology type, regional population served and regional WASH budget. This spread sheet tool will be further refined and made available to all stakeholders (national and regional governments. DPs, CSOs, private sectors).

The tool has been used to adjust regional proposals to reach GTP2 targets and to allow for a shift towards more sustainable technology mix. The resulting cost for the short to medium term work is estimated at USD 6.5 billion, of which USD 2 billion will be for the first stage CR-WASH interventions.

16.3 Constraints

Constraints include:

- Meet GTP2 targets by 2020, that is, within less than 3 years (used for initial planning and budget purposes but see commentary, **Sub-section 7.3**)
- Incorporate 40% of the proposed CR-WASH Program (Resilient and Sustainable Water Supply, Sanitation and Hygiene Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia), that is, USD 2 billion out of the estimated 5 billion budgeted for this Program
- Limited WASH capacity for implementation (planning, design, procurement, implementation)
- Low operational capability leading to high level of system failures
- Limited awareness, at all levels, of sanitation and hygiene impacts and needs, impacting health, quality of life and economic activity

In November 2017, regional sector offices (water, health and education) were invited to make 3-year plans to meet GTP2 targets. These plans have been tabulated and compared with both the original OWNP document 2013 and available data from CWA, DP and CSO sources.

16.4 Price Escalation

The unit cost for investment planning considered escalation price for dollar, cost changes for labour, material and equipment. Based on this fact, 3% price escalation has been added from the constant price annually [from 2018 – 2020. From the total program budget, the estimated cost/budget for imported items [electromechanical

equipment, pipes &fittings, etc.] is about 30 - 40% and estimated cost/budget for the local component is 60 -70 %.

16.5 Rural and Urban Water Supply Access

According to the GTP II targets, water supply access is expected to each to 83 % of the population. In order to determine water and sanitation access in Phase II the first step taken was to project the rural and urban population from the base year 2017 to 2020. Therefore, the total population to be considered for water supply in rural Ethiopia is 79,473,756 and in urban areas 21,871,006 (see details in **Annex 1)**.

Table 16-1 Rural and Urban Water Supply Access by Region and Year (%)*:*

No.	Region/City	Base Year	Phase II		
		2017	2018	2019	2020
1	Tigray				
	Rural	66.6	69	77	85
	Urban	56.6	59	68	75
	Total	64.8	68	76	83
2	Gambella				
	Rural	73.6	75	80	85
	Urban	40.3	46	61	75
	Total	64.2	67	75	83
3	B. Gumuz				
	Rural	60	63	75	85
	Urban	50	54	65	75
	Total	55.2	59	72	83
4	Dire Dawa				
	Rural	81	81	83	85
	Urban	55	58	67	75
	Total	61.1	64	74	83
5	Harari				
	Rural	65	68	77	85
	Urban	66	67	71	75
	Total	65.5	68	76	83
6	Somali				
	Rural	66.7	69	77	85
	Urban	64.5	66	71	75
	Total	65.3	68	76	83
7	Amhara				
	Rural	76.1	77	81	85
	Urban	69.1	70	73	75
	Total	75	76	80	83
8	Afar				
	Rural	44.6	50	69	85
	Urban	48.2	52	64	75

	Total	46	52	68	83
9	SNNPR				
	Rural	50.7	56	71	85
	Urban	50.3	54	65	75
	Total	52.5	57	71	83
10	Oromiya				
	Rural	60.7	64	75	85
	Urban	51.2	55	65	75
	Total	59.3	63	74	83
11	Addis Ababa				
	Urban	92	95	102	109
	Total	92	95	102	109
12	National				
	Rural	68.5	71	78	85
	Urban	54.7	58	67	75
	Total	**65.7**	**73**	**77**	**83**

Note: The access coverage is projected based on history of GTP I and the two years (2016 and 2017 GTP 2 growth rate trend which is found to be 3-4%.

16.6 Water Supply Beneficiaries

Unserved populations to be served to meet GTP2 Urban and rural population figures are indicated in the **Tables 16.2** and **16.3** based on spread sheets that calculate the unserved populations to be served to meet GTP2 urban and rural water supply targets. 2017 baseline figures come from the draft GTPII Report MoWIE 2009EFY and geometric population projection increases are then used (see working spread sheets to be issued separately).

Accordingly, a total of 20,410,739 million people in rural areas and 5,648,901 million people in urban areas are expected to benefit from Program water supply interventions. Note that the "population to be served by 2020" is calculated as 85% (rural) or 75% (urban) of "Projected population by the year 2020" minus "served population"

Table 16-2: No of Beneficiaries in rural areas in water supply access during Phase II

				Unserved projected population by the year 2020					
	Region	Baseline population for Phase II in year 2017	Water supply coverage in year 2017	Projected Population By the year 2020	Served population	Unserved Population		GTP2 target rural %age	Population to be served by 2020
1	Tigray	3,847,000	66.6%	3,934,359	2,560,563	1,373,796		85%	783,642
2	Afar	1,466,000	44.6%	1,545,951	653,836	892,115		85%	660,222
3	Amhara	17,453,000	76.1%	18,025,467	13,283,478	4,741,989		85%	2,038,169
4	Oromiya	30,113,000	60.7%	32,179,185	18,275,580	13,903,605		85%	9,076,728
5	Benishangul	836,000	60.0%	888,278	501,600	386,678		85%	253,437
6	SNNP	15,992,000	50.7%	16,903,089	8,101,547	8,801,542		85%	6,266,079
7	Gambela	288,000	73.6%	305,292	211,968	93,324		85%	47,530
8	Harar	109,000	65.0%	117,053	70,850	46,203		85%	28,645
9	Somali	4,911,000	66.7%	5,308,238	3,275,637	2,032,601		85%	1,236,365
10	Diredawa(35l/c/d)	173,000	81.0%	188,298	140,130	48,168		85%	19,923
	National		68.5%	79,395,210	47,075,189	32,320,020			20,410,739

Table 16-3:No of beneficiaries in urban areas to benefit in water supply access during Phase II

	Region	Baseline population for Phase II in year 2017	Water supply coverage in year 2017	Unserved projected population by the year 2020				GTP2 target urban %age	Unserved population to be served by 2020
				Population	Served population	Unserved			
1	Tigray	1,400,000	56.6%	1,633,334	792,680	840,654		75%	432,321
2	Afar	346,000	48.2%	414,248	166,772	247,476		75%	143,914
3	Amhara	3,682,000	69.1%	4,335,515	2,543,157	1,792,357		75%	708,479
4	Oromiya	5,354,000	51.2%	6,168,587	2,743,390	3,425,198		75%	1,883,051
5	Benishangul	230,000	50.0%	279,896	115,000	164,896		75%	94,922
6	SNNP	3,178,000	50.3%	3,730,962	1,598,534	2,132,428		75%	1,199,688
7	Gambela	148,000	40.3%	176,690	59,644	117,046		75%	72,874
8	Harar	137,000	66.0%	150,152	90,420	59,732		75%	22,194
9	Somali	838,000	64.5%	920,373	540,510	379,863		75%	149,770
10	Diredawa(35l/c/d)	293,000	55.0%	318,749	161,150	157,599		75%	77,912
11	Addis Ababa (35l/c	3,434,000	92.0%	3,690,878	3,159,280	531,598		109%	863,777
	National	19,040,000	54.7%	21,819,386	11,970,537	9,848,849			5,648,901

16.7 Rural water supply analysis methodology

Each region has given an estimate of total “unserved population to be planned for the remaining 3 Years” in the region, for each of rural and urban water supply, as well as needs for institutional WASH (health and education) and for capacity building. However, in the majority of cases, these populations do not align with the population the unserved 2020 populations which have been re-calculated in the spread sheets, described above, which are based on MoWIE estimates of GTP2 water supply coverage.

Label the re-estimated total regional rural water unserved population as $\mathbf{P_R}$.

Two spread sheets (scenarios) are provided separately for each region:

The first scenario worksheet tool (**Annex 3**) re-calculates the cost and population for the number of schemes $\mathbf{n_T}$ proposed by the region, using the unit rates calculated in **Annex 2**. The population served may be expressed as $\mathbf{\sum (p_T \times n_T)}$, where $\mathbf{p_T}$ is average population served by each technology type**.** This may be greater or less than $\mathbf{P_R}$.

The second scenario worksheet tool (**Annex 4**) then adjusts the number of schemes and the technology mix until the population served equals the GTP2 unserved population. $\mathbf{P_R}$. This may be expressed as $\mathbf{\sum (p_T \times n_T) = P_R}$. In this scenario the opportunity is taken to vary the technology mix to move towards: (i) meeting proposals under CR-WASH Program, that is deep boreholes and multi-village schemes, (ii) use of solar power and (iii) introduce what is considered to be more reliable technology.

It is recommended that both national government technical experts and the regional water bureaus staff should be given the opportunity to review the Scenario 2 technology mix and discuss possible amendments with the NWCO (consultants and Task Force) and the RWCOs, but not so as to hold up adoption of the Phase 2 Program and rapid implementation thereafter.

16.8 Scenario-2: Physical Plan and Financial requirement for Rural Water Supply

16.8.1 Rural Water Supply Summary

Additional factors have been applied to the CR-WASH (CR-WASH) component (that is, using 2030 projected design population) in order to allow for anticipated population movements triggered by installation of reliable water supply. Overall rural water supply cost becomes 2,096 USD million, of which 934 USD million is for CR-WASH Program (Resilient and Sustainable Water Supply, Sanitation and Hygiene Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia).

Table 16.4 below compares the original proposal made by the regions with the corrected regional proposals based on unit rate analyses (***Scenario 1***) and with adjusted proposals (***Scenario 2***) to meet GTP2 targets and improved technology mix. It also shows estimated share between CR-WASH (CR-WASH) and non-CR-WASH.

Table 16-4: Number of new rural schemes proposed, recalculated and adjusted target population for intervention

1	Region		Tigray	Gambella	B. Gumuz	Harari	Somali	Amhara	Afar	SNNPR	Oromia	Dire Dawa	Addis A	Totals
2	Original proposal from region	Number of schemes	5,584	1,396	796	225	6,418	27,860	631	12,331	13,222	61		68,524
3		population to be served, million	2.09	0.16	0.24	0.05	1.09	4.30	0.53	13.20	4.62	0.06		26.34
4		**cost, USD million***	**70.3**	**11.4**	**17.7**	**1.3**	**335.6**	**223.0**	**76.8**	**371.4**	**254.2**	**14.8**		**1,376.5**
5		Av unit rate USD/c	33.6	71.3	74.8	26.6	307.3	51.9	144.9	28.1	55.1	246.7		52.3
6	Recalcuated regional proposal based on average unit rates and population served per technology	Number of schemes	5,584	1,396	796	225	6,418	27,860	631	12,331	13,222	61		68,524
7		population to be served, million	1.74	0.56	0.25	0.16	1.80	6.25	0.56	4.69	5.14	0.11		21.25
8		cost, USD million*	113.5	19.2	12.5	13.1	223.2	141.2	64.8	274.0	294.6	10.5		1,166.7
9		Av unit rate USD/c	65.1	34.2	49.2	84.3	124.2	22.6	116.0	58.5	57.4	95.9		54.9
10	**Adjusted target population and technology mix**	**Number of schemes**	**2,025**	**162**	**796**	**199**	**4,506**	**5,000**	**721**	**13,422**	**23,033**	**13**		**49,877**
11		**population to be served, million**	**0.78**	**0.05**	**0.25**	**0.03**	**1.24**	**2.04**	**0.66**	**6.27**	**9.08**	**0.02**		**20.41**
12		**cost, USD million***	**64.6**	**2.6**	**12.5**	**6.7**	**160.1**	**111.1**	**85.2**	**367.6**	**543.9**	**1.7**		**1,355.9**
13		**Av unit rate USD/c**	**82**	**54**	**49**	**235**	**129**	**55**	**129**	**59**	**60**	**87**		**66**
14		**Factored cost totals, USD million**	**89.8**	**3.6**	**17.3**	**9.3**	**222.5**	**154.4**	**118.4**	**510.9**	**756.0**	**2.4**	**0.0**	**1,884.7**
15	** **Note 1** : To these figures have here been added factors for rehabilitation(3%),investigation,design and project management (12%) Environmental Safegurd, Water Safety Plans and Water Quality Mangment, , Catchment protection and Environmental management plansCatchment protection and Environmental management plans(6%?), inflation (10% for 3 years?) , combined 39%*													*1.39*
16	**non-CR and CR WASH share estimates**	Estimated %age mix of CR-WASH	20%	0%	0%	30%	100%	20%	100%	20%	30%	30%	0%	
17		Non CR-WASH %age	80%	100%	100%	70%	0%	80%	0%	80%	70%	70%	100%	
18		**Estimated non-CR WASH share, USD million**	**71.8**	**3.6**	**17.3**	**6.5**	**0.0**	**123.5**	**0.0**	**408.8**	**529.2**	**1.7**	**0.0**	**1,162.5**
19		Estimated CR WASH share, USD million	18.0	0.0	0.0	2.8	222.5	30.9	118.4	102.2	226.8	0.7	0.0	
20		Additional factor for 2032 design population to be used for large MV CR WASH schemes likely to trigger population movements	1.10	1.26	1.27	1.36	1.36	1.14	1.24	1.25	1.31	1.40		
21		**Total CR WASH, USD million**	**19.7**	**0.0**	**0.0**	**3.8**	**303.5**	**35.2**	**146.9**	**127.5**	**296.2**	**1.0**	**0.0**	**933.9**
22	**Final proposed totals**	*compare with Row 4 above*	**91.5**	**3.6**	**17.3**	**10.3**	**303.5**	**158.7**	**146.9**	**536.3**	**825.4**	**2.7**	**0.0**	**2,096.4**

16.8.2 New Rural Water Supply Facilities

Table 16-5: Rural Water Supply Technology Mix Planned for intervention, 2018-2020

Sr No	Region	Self-Supply System		Spot Supply System								Piped Water supply System						Total	2018	2019	2020
		Household Dug well with Rope Pump	Community Dug well with Rope Pump	Dug well with Hand Pump	SW (with HP)	SW (Solar system, Small On Spot)	BH+Dist (Small) On Spot	Capped Spring	Rain Water harvesting	Cistern	Hafir Dam	SVS from spring source	MVS from spring source	SVS from BH source	MVS from BH source	SVs from Surface Water	MVS from Surface Water				
1	**Oromiya**																				
	Planned #of Schemes	0	0	5,875	1,461	4,000	**500**	4,827	5,000			**300**	**350**	**700**	**10**		**10**	**23,033**	**2,303**	**9,213**	**11,517**
	Mix Ratio	0.0000	0.0000	0.2551	0.0634	0.1737	0.0217	0.2096	0.2171	0.0000	0.0000	0.0130	0.0152	0.0304	0.0004	0.0000	0.0004	1			
2	**Amhara**																				
	Planned #of Schemes	500	500	500	500	500	200	2,000	180			20	60	10	25		5	5,000	500	2,000	2,500
	Mix Ratio	0.1000	0.1000	0.1000	0.1000	0.1000	0.0400	0.4000	0.0360	0.0000	0.0000	0.0040	0.0120	0.0020	0.0050	0.0000	0.0010	1			
3	**Tigray**																				
	Planned #of Schemes	300	300	300	200	200	80	200		180	180	15		50	20			2,025	203	810	1,013
	Mix Ratio	0.1481	0.1481	0.1481	0.0988	0.0988	0.0395	0.0988	0.0000	0.0889	0.0889	0.0074		0.0247	0.0099	0.0000	0.0000	1			
4	**SNNP**																				
	Planned #of Schemes		2,166	1,296	3,000	1,000	0	3,332	1,500			444		584	100			13,422	1,342	5,369	6,711
	Mix Ratio	0.0000	0.1614	0.0966	0.2235	0.0745	0.0000	0.2482	0.1118	0.0000	0.0000	0.0331		0.0435	0.0075	0.0000	0.0000	1			
5	**Benshiangul-Gumuz**																				
	Planned #of Schemes			120	624	10		24						10	8			796	80	318	398
	Mix Ratio	0.0000	0.0000	0.1508	0.7839	0.0126	0.0000	0.0302	0.0000	0.0000	0.0000	0.0000		0.0126	0.0101	0.0000	0.0000	1			
6	**Gambella**																				
	Planned #of Schemes	100		12	10	10	2	15			7	3		2	1			162	16	65	81
	Mix Ratio	0.6173	0.0000	0.0741	0.0617	0.0617	0.0123	0.0926	0.0000	0.0000	0.0432	0.0185		0.0123	0.0062	0.0000	0.0000	1			
7	**Afar**																				
	Planned #of Schemes			148	96	100		7	100	163	7			70	30			721	72	288	361
	Mix Ratio	0.0000	0.0000	0.2053	0.1331	0.1387	0.0000	0.0097	0.1387	0.2261	0.0097	0.0000		0.0971	0.0416	0.0000	0.0000				
8	**Somali**																				
	Planned #of Schemes	0.0000	500	200		100		65	2,430	967	94			35	80		35	4,506	451	1,802	2,253
	Mix Ratio	0.0000	0.1110	0.0444	0.0000	0.0222	0.0000	0.0144	0.5393	0.2146	0.0209	0.0000		0.0078	0.0178	0.0000	0.0078	1			
9	**Harari**																				
	Planned #of Schemes			10			2				180	2		2	1	2		199	20	80	100
	Mix Ratio	0.0000	0.0000	0.0503	0.0000	0.0000	0.0101	0.0000	0.0000	0.0000	0.9045	0.0101		0.0101	0.0050	0.0101	0.0000	1			
10	**Diredawa**																				
	Planned #of Schemes				4	2	2		2			1		1	1			13			
	Mix Ratio	0.0000	0.0000	0.0000	0.3077	0.1538	0.1538	0.0000	0.1538	0.0000	0.0000	0.0769		0.0769	0.0769	0.0000	0.0000	1	1	5	7
Grand Total by type of Technology		**900**	**3,466**	**8,461**	**5,895**	**5,922**	**786**	**10,470**	**9,212**	**1,310**	**468**	**785**	**410**	**1,464**	**276**	**2**	**50**	**49,877**	**98,854**	**194,242**	**380,023**
Grand Total by type of system		**4,367**		**42,532**								**2,987**									

Key: Shallow Well (SW); Borehole (BH+); Single Village System (SVS); Multi Village (MVS)

16.8.3 Rural Water Supply Facilities to be rehabilitated

The Unit Cost analyses made for rehabilitation can only be determined accurately for specific existing schemes when a scheme inspection has revealed which components needs maintenance and expansion and the magnitude of the capacity expansion that is required. It is not an easy task to determine reasonable unit cost for rehabilitation and capacity inspection at national level where scheme by scheme assessments are not available. Therefore, rehabilitation, upgrading and/or expansion plan has been taken regional plan to determined proportion and 3% of total rural water supply cost is taken for rehabilitation of Rural water supply schemes The water supply schemes that need rehabilitation and upgrading to reduce non-functionality to 7% in line with GTP-II target are shown below.

16.8.4 Financial Requirement for Water Supply

A total of USD 2,096 million is required for rural water supply to achieve the target of 85% access. This considered reasonable considering the scale and complexity of what needs to be done for the 80% of the country's population and in light of highly varied and often harsh geography and climatic conditions of rural areas.

As part of the overall rural water supply requirement the financial requirement for, Water Quality Management/Water Safety Plans, study and design, Catchment Protection and Environmental Management Plans, Environmental mental safeguards are determined in addition to construction and rehabilitation of water supplies are also included and are shown below.

Table 16-6: Cost of water supply by region, OWNP Phase II, 2018-2020

No	Region / City/Year	Cost of Scheme Construction	No.	Region / City/Year	Cost of Scheme Construction
1	**Tigray**		**7**	**Amhara**	
	2018	12,683,769		2018	26,946,757
	2019	38,051,308		2019	80,840,270
	2020	33,823,384		2020	71,858,018
	Total	**84,558,460**		**Total**	**179,645,045**
2	**Gambella**		**8**	**Afar**	
	2018	730,953		2018	15,777,719
	2019	2,036,991		2019	47,333,158
	2020	1,833,703		2020	42,073,918
	Total	**4,601,648**		**Total**	105,184,796
3	**B. Gumuz**		**9**	**SNNPR**	
	2018	2,623,482		2018	85,893,638
	2019	7,696,533		2019	227,919,949
	2020	6,851,024		2020	201,325,947
	Total	**17,171,039**		**Total**	515,139,534
4	**Dire Dawa**		**10**	**Oromiya**	
	2018	13,955,120		2018	114,593,052
	2019	41,800,139		2019	330,690,756
	2020	37,159,302		2020	293,943,084

	Total	**92,914,561**		**Total**	739,226,892
5	**Harari**		6	**Somali**	
	2018	1,267,028		2018	30,782,888
	2019	3,738,474		2019	92,348,663
	2020	3,333,523		2020	82,087,701
	Total	**8,339,026**		**Total**	**205,219,252**
6	**National**				
	2018	307,075,680		Federal	1821273.762
	2019	877,920,062			5463821.287
	2020	779,146,335			4856730.366
		1,964,142,078			12141825.41
	Additional budget allocated for large MV CR WASH schemes & 2032 design pop	132,222,828			
	Grand Total	**2,096,364,906**			

Note: The detail cost allocated for each technology by region, see **Annex 4**

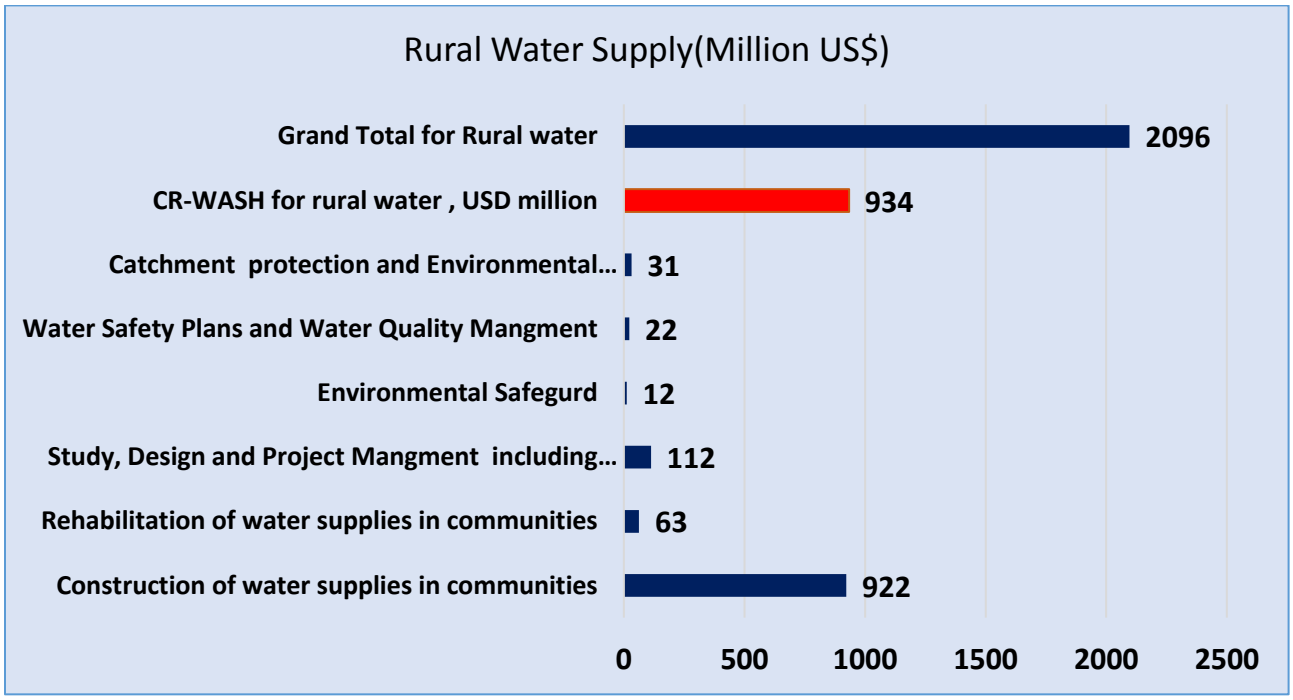


Figure 16-1: Summary of cost for rural water supply, Phase II 2018-2020

16.8.5 Institutional WASH

The investments required for water supply and sanitation facilities in institutions have been calculated based on the sanitation micro-plans to achieve universal access by 2030 and adjusted to the specific targets for WASH in institutions included under GTP-2 (80% water coverage in schools and 60% water coverage in health post and health centers).

The budget for School WASH also includes targeting 80% of the 36,518 schools (33,524 primaries and 2,994 secondary) with MHM and other hygiene promotion packages.

The budget for WASH in health institutions includes all infrastructure investments to ensure 60% of water coverage in health posts and health centers, as well as software activities such as the IPPS (Infection prevention and patient safety).

Table 16-7: Summary of cost for WASH in schools by region, Phase II 2018-2020

Region Name	Primary schools rural areas	Primary schools urban areas	Secondary schools (both rural and urban)	Total WASH in schools (ETB)	Total WASH in schools (US$)
Addis Ababa	-	63,428,000	67,912,320	131,340,320	**4,690,725.71**
Afar	473,473,361	-	10,669,440	484,142,801	**17,290,814.32**
Amhara	3,614,511,987	27,368,000	107,591,840	3,749,471,827	**133,909,708.11**
Benshangul Gumuz	255,842,370	-	437,340,020	693,182,390	**24,756,513.93**
Dire Dawa	14,738,589	4,040,000	111,265,000	130,043,589	**4,644,413.89**
Gambella	89,064,722	-	40,420,900	129,485,622	**4,624,486.50**
Harari	26,735,471	15,535,560	190,410,060	232,681,091	**8,310,038.96**
Oromiya	6,176,829,243	2,716,800	24,348,200	6,203,894,243	**221,567,651.54**
SNNP	4,605,655,592	202,290,000	3,394,560	4,811,340,152	**171,833,576.86**
Somali	1,615,739,068	-	43,033,400	1,658,772,468	**59,241,873.86**
Tigray	185,751,624	11,320,840	3,801,000	200,873,464	**7,174,052.29**
Total	17,058,342,027	326,699,200	1,040,186,740	18,425,227,967	**658,043,855.96**
Total USD	**609,226,500.96**	**11,667,828.57**	**37,149,526.43**	**658,043,855.96**	

Table 16-8: Summary of cost for WASH in health center centers by region, Phase II 2018-2020

Region Na*me	Health Post WASH Cost in rural areas (ETB)	Health Centre WASH Cost in rural areas (ETB)	Heath Centre in urban areas (ETB)	Total (ETB)	Total (USD)
Addis Ababa			25,200,000	25,200,000	**900,000**
Afar	56,552,000	38,178,253	55,400,000	150,130,253	**5,361,795**
Amhara	464,631,241	119,823,030	218,400,000	802,854,271	**28,673,367**
Benshangul Gumuz	50,677,704	-	10,780,000	61,457,704	**2,194,918**
Dire Dawa	-	-	4,060,000	4,060,000	**145,000**
Gambella	18,619,138	-	53,110,000	71,729,138	**2,561,755**
Harari	-	1,574,733	7,210,000	8,784,733	**313,740**
Oromiya	452,272,505	182,347,862	1,970,000	636,590,367	**22,735,370**
SNNP	615,273,934	149,900,800	372,810,000	1,137,984,734	**40,642,312**
Somali	219,572,613	28,382,000	192,140,000	440,094,613	**15,717,665**
Tigray	75,679,164	105,216,000	24,020,000	204,915,164	**7,318,399**
Total	1,953,278,299	625,422,678	965,100,000	3,543,800,977	**126,564,321**
Total USD	**69,759,939.25**	**22,336,524.21**	**34,467,857.14**	**126,564,320.61**	

Note: The Source of information is Sanitation micro planning prepared by UNICEF, please refer the detail activities and unit cost from separate document

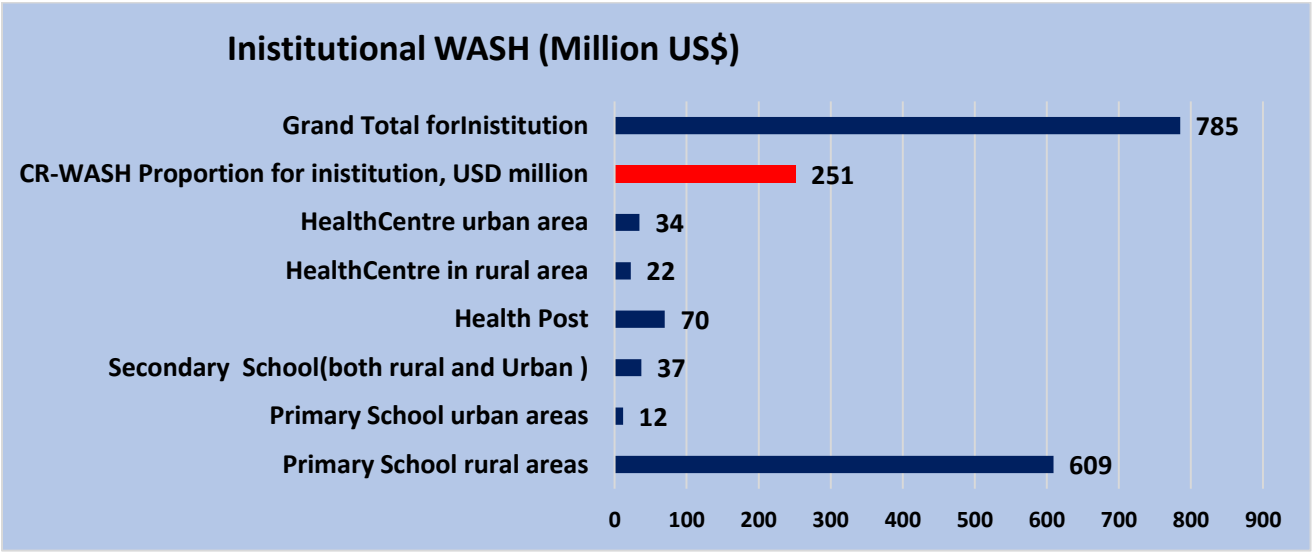


Figure 16-2: Institutional WASH estimate

16.8.6 Urban Water Supply Physical and Financial Plan

Per capita unit rates have been derived from all sources and variations are illustrated in the figure below. Phase 1 estimates have proved to be too low and the recent rates used by the regions are considered to be unreliable. Hence limited information from other sources has been analyzed and is recommended for use: see **Table 16.9** below:

Table16-9: Per capita Unit Rate for Urban Water Supply (USD)

1	Parameters	Urban water unit rates, USD per capita by Regions										
2	Regions and City Administrations	Oromiya	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambella	Harari	Dire Dawa	Addis Ababa
3	Per capita cost national average of all category	91	91	91	91	91	91	91	91		91	
4	SDG WASH Costing Tools basic water estimate Including price inflation for year 2017	94	94	94	94	94	94	94	94		94	
5	Regional Factor proposed in phase-I	1	1	1.05	1	1.25	1.1	1.25	1.1		1.05	
6	Regional factors developed from unit cost analyses of different NGOs and CWA project records	1.06	1.06	1.10	1.07	1.28	1.08	1.11	1.09		1.08	
7	Regional factors, average of above 2 rows	1.03	1.03	1.07	1.04	1.27	1.09	1.18	1.09		1.06	
8	Per capita unit rate from OWNP Phase-I document	28	39	28	23	67	30	33	31		28	
9	Factored per capita unit rate planned by regions for OWNP phase-II	34	43	11	459	130	74	122	113		1	
10	**Regional unit rates from CR-WASH**	**127**	**127**	**133**	**127**	**145**		**145**				
11	Per capita unit rates derived from available sources	94	94	98	94	115	99	107	100		97	
12	Per capita Unit Rate that takes account of the various factors from SDG WASH Costing Tools	97	97	101	97	119	102	111	103		100	
13	**Average of above 2 rows recommended for use alongside CR-WASH figures**	**95**	**95**	**99**	**96**	**117**	**101**	**109**	**101**		**98**	**47**
	Note: rates in Row 13 to be used, but supplemented by Row 10 according to proportion of very deep well schemes											

Note: These rates are based on design population, assumed to be 2032

16.8.7 Urban technology mix

In order to achieve greater resilience and reliability, it has been decided to increase the mix of very deep boreholes in drought prone areas, both urban and rural. Funding source for the drought prone area interventions under CR-WASH (Resilient and Sustainable Water Supply, Sanitation and Hygiene Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia, also termed "CR-WASH") has been identified separate from other funding sources, so that the table below reflects this distinction.

The percentages of CR-WASH and non-CR-WASH are based on estimates from recent WASH Cluster reports: However, this will require inputs from both national experts and regional actors with local knowledge: The spread sheet tool is designed to be user friendly so that this can be easily done.

The overall cost is **1,832 USD million** (including **386 USD million CR-WASH**) is considered to be reasonable considering the scale of what needs to be achieved in the light of very rapid urban development.

The total amount proposed by the regions was 1,919 million USD. The difference can be accounted by (a) a higher target population of 11.27 million compared with GTP2 target of 5.78 million and (b) while Oromiya region underestimated costs by half, SNNP region would appear to have overestimated urban costs by a factor of 7.

Table 16-10: Urban water cost, GTP II, 2018-2020

1	**Urban water costs to meet GTP2, USD million**	**Region**											
2	***Note**: These rates are based on design population, assumed to be that projected for 2032*	**Oromia**	**Amhara**	**Tigray**	**SNNP**	**Somali**	**B Gumuz**	**Afar**	**Gambela**	**Harari**	**Dire Dawa**	**Addis Ababa**	**Total**
3	**Unit rates from CR-WASH, USD/c**	**127**	**127**	**133**	**127**	**145**		**145**	**134**	**134**	**134**		
4	**Recommended for use for non CR-WASH, USD/c**	**95**	**95**	**99**	**96**	**117**	**101**	**109**	**101**	**123**	**98**	**319**	
5	Unserved population to be served by 2020, million	1.88	0.71	0.43	1.20	0.15	0.09	0.14	0.07	0.15	0.08	0.86	**5.78**
6	Estimated %age mix of CR-WASH to 2020, from latest	30%	20%	20%	20%	100%	0%	100%	0%	30%	30%	0%	**32%**
7	Non CR-WASH %age	70%	80%	80%	80%	0%	100%	0%	100%	70%	70%	100%	
8	Cost, USD million = Row 5 x (Row 3 x Row 6 + Row 4 x Row 7)	197.1	72.0	45.8	122.3	21.7	9.5	20.9	7.4	19.0	8.5	275.8	**800.0**
9	***Note**: To all these figures must be added factors for investigation, design and project management (15%),Environmental Safe guard(2%), Catchment Protection(2%), inflation (10% for 3 years) and risk (10%), combined 39%.*												*1.39*
10	**Totals**	**274.3**	**100.1**	**63.8**	**170.2**	**30.2**	**13.3**	**29.0**	**10.3**	**26.4**	**11.8**	**383.7**	**1,113.1**
11	**CR-WASH, USD million, without design factor**	82.3	20.0	12.8	34.0	30.2	0.0	29.0	0.0	7.9	3.5	0.0	**219.8**
12	**non-CR-WASH, USD million, without design factor**	192.0	80.1	51.0	136.2	0.0	13.3	0.0	10.3	18.5	8.3	383.7	**893.3**
13	*Factor to allow for use of 2032 design population compared with GTP2 2020 population for calculating costs*	1.76	1.92	1.85	1.90	1.46	2.19	1.85	2.03	1.44	1.40	1.33	
14	Totals with design factors USD million	483.3	192.5	118.2	323.4	44.0	29.1	53.8	20.8	38.1	16.5	512.1	**1,832**
15	CR-WASH, USD million, with design factor	145.0	38.5	23.6	64.7	44.0	0.0	53.8	0.0	11.4	5.0	0.0	385.9
16	non-CR-WASH, USD million, with design factor	338.3	154.0	94.6	258.7	0.0	29.1	0.0	20.8	26.7	11.6	512.1	1,445.8
17	Original regional proposal unserved population to be served by 2020, million	1.71	1.24	0.79	2.61	0.24	0.11	0.11	0.08	0.00	0.01	0.86	**7.77**
18	**Regional proposal, USD million**	**142.5**	**106.8**	**55.2**	**1242.2**	**57.0**	**16.5**	**39.1**	**50.3**	**0.0**	**2.7**	**275.8**	**1988.1**
19	Unit rate from regional proposal, USD/c	83	86	70	475	241	144	342	625		300	319	

Note: ***Note: These rates are based on design population, assumed to be that projected for 2032***

Urban water supply activities will need to be undertaken in 973 towns to achieve 75% access during phase II as shown below.

Table 16-11: Financial Requirement for planned Urban Water Supply by Region and Year (USD)

Fisical Year	Activities	Number of planned activities by Region and year											
		Oromia	**Amhara**	**Tigray**	**SNNP**	**Somali**	**Beniha-Gumuz**	**Afar**	**Gambela**	**Harari**	**Dire Dawa**	**Addis Ababa**	**Total**
I	Urban Water Supply												
2018	Study and Design	50	19	12	32	4	3	4	2	0.10	0.10	0.10	126
	New Construction	11	4	3	7	1	1	1	0				28
	Rehabilitation and expansion	39	15	9	25	3	2	3	2	0.10	0.10	0.10	98
2019	Study and Design	201	76	46	128	16	10	16	8	0.40	0.40	0.40	503
	New Construction	45	17	10	29	4	2	4	2				113
	Rehabilitation and expansion	156	59	36	100	12	8	12	6	0.4	0.4	0.4	390
2020	Study and Design	252	95	58	160	20	13	19	10	0.5	0.50	0.50	628
	New Construction	56	21	13	36	4	3	4	2				140
	Rehabilitation and expansion	196	74	45	125	16	10	15	8	0.5	0.5	0.5	488
Total	**Study and Design**	504	189	116	321	40	26	39	19	1	1	1	**1256**
	New Construction	112.5	42.3	25.8	71.7	9.0	6.0	9.0	4.0	0.0	0.0	0.0	**280**
	Rehabilitation and expansion	391	147	90	249	31	20	30	15	1	1	1	**976**
	Grand Total Urban Water supply Cost in Million .(USD)	**483**	**192**	**118**	**323**	**44**	**29**	**54**	**21**	**38**	**17**	**512**	**1832**

Note: The Source of information is Sanitation Micro Planning prepared by UNICEF;

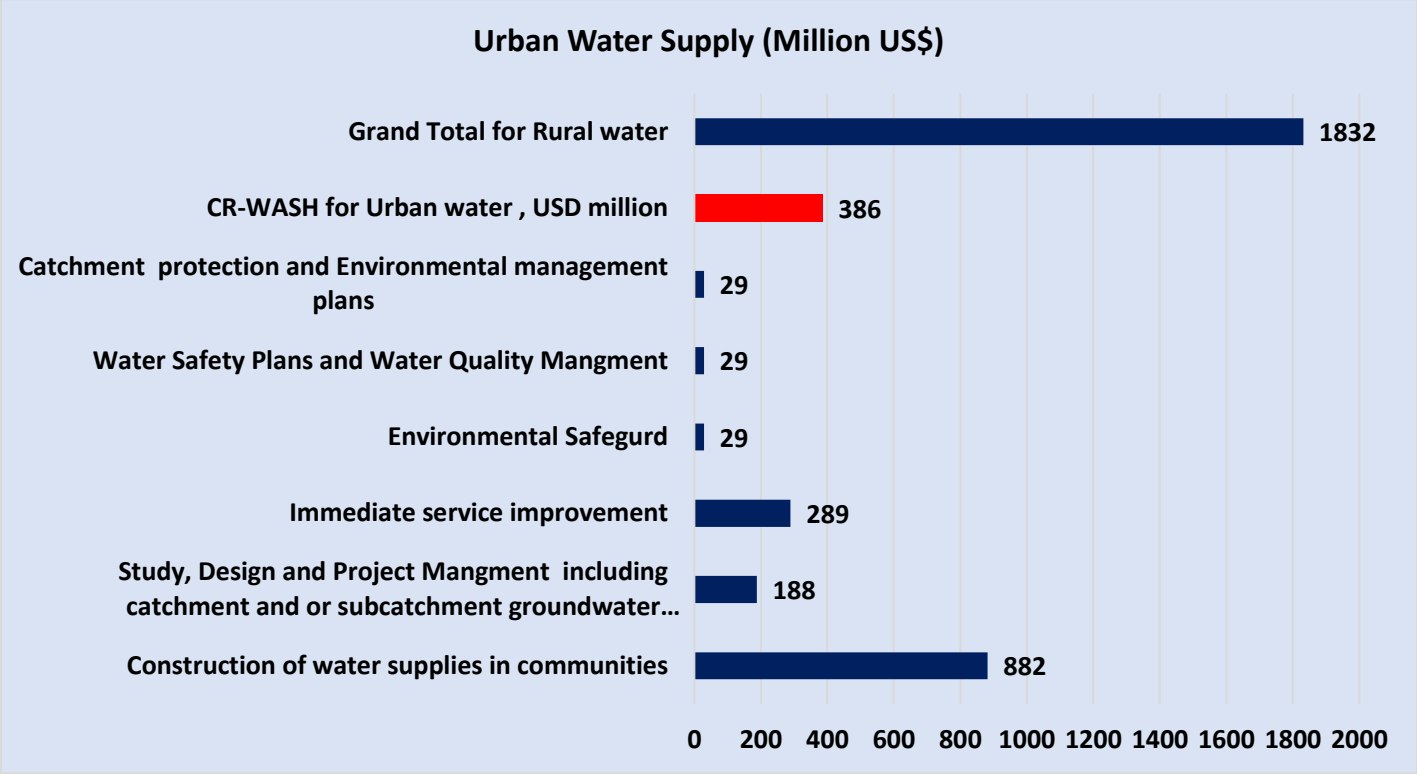


Figure 16-3: Urban Water Supply, summary of costs

New Construction will be implemented in lower category below category 4 of towns for 280 towns. For higher category of town 1, 2 &3, the phase II program mainly focused on rehabilitation and expansion program because most of towns have reached the target water supply coverage (75%) and some are exceeded this coverage, although hours of supply and water quality remain poor.

16.8.8 Rural and Peri-urban Sanitation and Hygiene Physical Plan

The target for rural sanitation activities is to increase access to improved sanitation facilities and hygiene practice. An estimated **USD 394,689,743** is required to achieve the Program's physical targets. The regional distribution of the financial requirement is shown below in **Table 16.12** and total costs are illustrated by **Figure 16.4**.

Note that the cost of software for advocacy and capacity building is described under program management and capacity building section

Table 16-12: The regional distribution of the financial requirement for rural and peri-urban sanitation

Region Name	Taking villages to Primary ODF village status		Taking villages to Secondary ODF village status		Taking villages to Safely Managed sanitation village status		Fixed Costs for training; supervision and monitoring	Regional costs	Total Costs (ETB)	Total Costs (USD)
	Estimated Cost	Physical Target	Estimated Cost	Physical Target	Estimated Cost	Physical Target				
Addis Ababa	-	-	-	-	-	-	-	-	-	-
Afar	30,886,825	2,046	28,441,241	2,198	94,804,136	2,198	20,073,600	5,820,000	180,032,244	6,429,723
Amhara	197,496,941	21,454	299,330,475	33,600	312,969,611	35,131	135,453,796	22,844,000	968,185,008	34,578,036
Benshangul Gumuz	33,908,074	1,053	75,542,500	2,500	45,100,000	2,500	9,676,000	2,972,000	167,204,627	5,971,594
Dire Dawa	37,602,453	350	38,410,477	381	22,931,628	381	4,477,200	1,308,000	104,730,870	3,740,388
Gambella	29,075,896	767	20,595,120	910	20,595,120	910	483,800	2,252,000	73,004,523	2,607,304
Harari	9,811,474	84	20,934,612	191	12,498,276	191	590,400	828,000	44,663,228	1,595,115
Oromia	2,055,468,542	104,162	2,773,234,620	149,765	1,661,245,288	150,270	423,189,467	40,604,000	6,954,146,113	248,362,361
SNNP	107,189,109	56,144	302,215,478	31,659	566,350,690	91,960	324,839,034	20,684,000	1,321,458,074	47,194,931
Somali	102,341,190	4,382	89,322,499	4,462	73,253,571	4,468	58,006,832	14,220,000	337,157,404	12,041,336
Tigray	181,181,498	950	395,869,420	2,212	278,436,670	2,606	40,153,347	5,084,000	900,730,703	32,168,954
Total	2,784,962,002	191,392	4,043,896,442	227,878	-3,088,184,991	290,614	1,016,943,476	116,616,000	11,051,312,795	394,689,743
Total USD	99,462,928.66	6,835.42	144,424,872.94	8,138.48	110,292,321.09	10,379.08	36,319,409.86	4,164,857.14	394,689,742.68	

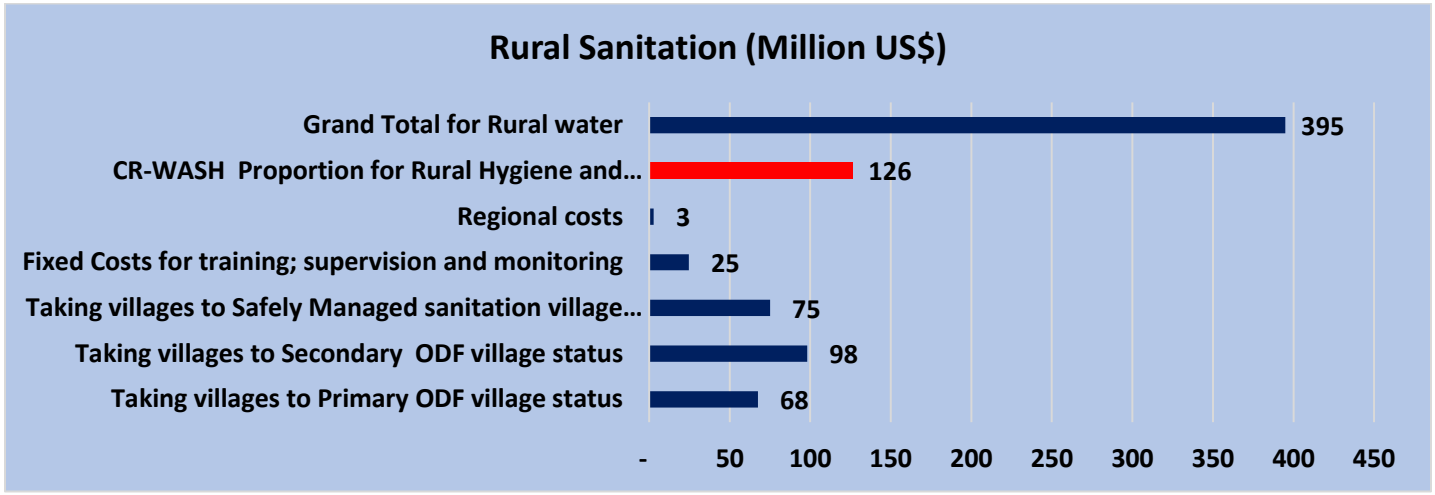


Figure 16-4: Rural Sanitation Budget

16.8.9 Urban sanitation

Since the information from the regions on urban sanitation is not complete, the GOE approved IUSHSAP proposals (valid 2016/7) excluding SWM components *and Second Ethiopia Urban Water Supply and Sanitation Project and March 10, 2017) WB document have* been used as can be seen in the **Table 16.13** below and illustrated by **Figure 16.5**.

Table 16-13: Urban sanitation plan

Activity	Amount (USD million)	%
Sanitation services improvement	312	42%
Water supply and operational efficiency improvement	52	7%
Project management and institutional development	8	1%
Public Toilets Construction in 973 towns	30	4%
Communal Toilets Construction in 973 towns	40	5%
School Toilets Construction in 973 towns	42	6%
14 towns Study and design	2	0%
Rehabilitation of Sanitation Facilities	23	3%
CR-WASH Proportion for Urban Sanitation, USD million	239	**32%**
Grand Total for Rural water	748	**100%**

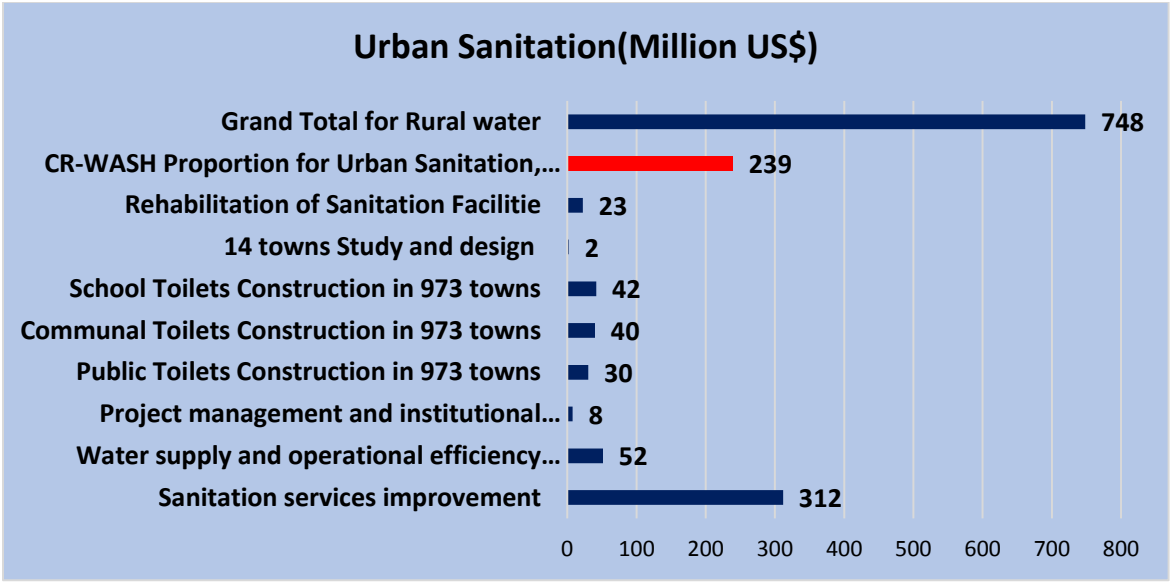


Figure 16-5: Cost for Urban sanitation

16.8.10 Capacity building and program management

Table 16-14: Capacity Building and Program management

No.	Activity	Oromiya	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambella	Harari	Dire Dawa	Federal	Total
1	**Program management**												**34**
	2018	0.81	0.48	0.25	0.43	0.27	0.13	0.17	0.13	0.07	0.00	0.66	3
	2019	3.25	1.92	0.99	1.72	1.06	0.53	0.68	0.51	0.29	0.00	2.64	14
	2020	4.07	2.41	1.24	2.14	1.33	0.67	0.85	0.63	0.37	0.00	3.29	17
	Total	8.14	4.81	2.48	4.29	2.66	1.34	1.70	1.26	0.74		6.59	34
2	**Advocacy**												**12.0**
	2018	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.06	
	2019	0.46	0.46	0.46	0.46	0.46	0.46	`	0.46	0.46	0.46	0.24	
	2020	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.30	
	Total	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	0.60	12.00
3	**Capacity Building Costs including TVETCs and HSCs ,Training, Manual Preparation, Procurement of Software, Motor Bikes and Vehicles**												**100**
	2018	3.83	1.44	0.88	2.44	0.30	0.19	0.29	0.15	0.31	0.16	0.00	10
	2019	15.33	5.77	3.52	9.77	1.22	0.77	1.17	0.59	1.22	0.63	0.00	40

No.	Activity	Oromiya	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambella	Harari	Dire Dawa	Federal	Total
	2020	19.16	7.21	4.40	12.21	1.52	0.97	1.46	0.74	1.53	0.79	0.00	50
	Total	38.33	14.42	8.80	24.42	3.05	1.93	2.93	1.48	3.06	1.59	0.00	100
4	**Training of Key Utility staffs on water Governance such as asset management, leakage management customer management etc.**												**20**
	2018	0.77	0.29	0.18	0.49	0.06	0.04	0.06	0.03	0.06	0.03	0.00	2
	2019	3.07	1.15	0.70	1.95	0.24	0.15	0.23	0.12	0.24	0.13	0.00	8
	2020	3.83	1.44	0.88	2.44	0.30	0.19	0.29	0.15	0.31	0.16	0.00	10
	Total	7.67	2.88	1.76	4.88	0.61	0.39	0.59	0.30	0.61	0.32	0.00	20
5	**Establish Water supply quantity and quality monitoring system**												**8**
	2018	0.31	0.12	0.07	0.20	0.02	0.02	0.02	0.01	0.02	0.01	0.00	1
	2019	1.23	0.46	0.28	0.78	0.10	0.06	0.09	0.05	0.10	0.05	0.00	3
	2020	1.53	0.58	0.35	0.98	0.12	0.08	0.12	0.06	0.12	0.06	0.00	4
	Total	3.07	1.15	0.70	1.95	0.24	0.15	0.23	0.12	0.24	0.13	0.00	8
7	**Capacity Building, Software, Procurement Vacuum suction trucks and other seed money for research, promotion etc. for urban program**												**70**
	2018	2.69	1.01	0.62	1.72	0.21	0.14	0.21	0.10	0.21	0.11	0.00	7
	2019	10.77	4.05	2.47	6.86	0.86	0.54	0.82	0.42	0.86	0.45	0.00	28
	2020	13.46	5.06	3.09	8.58	1.07	0.68	1.03	0.52	1.07	0.56	0.00	35
	Total	26.92	10.13	6.18	17.15	2.14	1.36	2.06	1.04	2.15	1.11	0.00	70
9	**Support to Supply Chains**												**14**
	2018	0.54	0.20	0.12	0.34	0.04	0.03	0.04	0.02	0.04	0.02		1
	2019	2.15	0.81	0.49	1.37	0.17	0.11	0.16	0.08	0.17	0.09		6
	2020	2.68	1.01	0.62	1.71	0.21	0.14	0.21	0.10	0.21	0.11		7
	Total	5.37	2.02	1.23	3.42	0.43	0.27	0.41	0.21	0.43	0.22		14
11	**Self-Supply Technical Assistance**												**15**
	2018	0.57	0.22	0.13	0.37	0.05	0.03	0.04	0.02	0.05	0.02	0.00	2
	2019	2.30	0.87	0.53	1.47	0.18	0.12	0.18	0.09	0.18	0.10	0.00	6
	2020	2.87	1.08	0.66	1.83	0.23	0.14	0.22	0.11	0.23	0.12	0.00	8
	Total	5.75	2.16	1.32	3.66	0.46	0.29	0.44	0.22	0.46	0.24	0.00	15
13	**Post construction Support**												**12**
	2018	0.46	0.17	0.11	0.29	0.04	0.02	0.04	0.02	0.04	0.02	0.00	1
	2019	1.84	0.69	0.42	1.17	0.15	0.09	0.14	0.07	0.15	0.08	0.00	5
	2020	2.30	0.87	0.53	1.47	0.18	0.12	0.18	0.09	0.18	0.10	0.00	6
	Total	4.60	1.73	1.06	2.93	0.37	0.23	0.35	0.18	0.37	0.19	0.00	12
14	**M&E, MIS and Data Management**												**159**
	2018	3.80	2.25	1.16	2.01	1.24	0.62	0.80	0.59	0.34	0.00	3.08	16
	2019	15.22	9.00	4.64	8.02	4.97	2.50	3.18	2.37	1.38	0.00	12.33	64
	2020	19.02	11.25	5.80	10.03	6.22	3.12	3.98	2.96	1.72	0.00	15.41	79
	Total	38.05	22.50	11.59	20.06	12.43	6.25	7.95	5.91	3.44		30.81	159
	Grand Total												**444**

Table 16-15: Technical Assistance - Pastoralist WASH

N0	Technical Assistance	Number of regions	2018	2019	2020	Total
1	Resource mapping and feasibility study for WASH facility	6	-	3.60	5.40	9.00
2	Appropriate water supply and sanitation Technology	6	-	2.16	3.24	5.40
3	Establishment of Scheme management System and Build capacity (For Spot supply and MVS) of water supplies	6	-	1.44	2.16	3.60
	Total		-	**7.20**	**10.80**	**18.00**

Table 16-16: Support to Research and technical assistance for regional water bureau and private privet institute

N0	Description of activities	Years			
		2018	2019	2020	Total(USD)
1	Support to Research and Water Technology institute	-	2.00	3.00	5.00
2	Technical assistance for Regional bureau & Local Drilling private institute	-	4.00	6.00	10.00
	Total		**6.00**	**9.00**	**15.00**

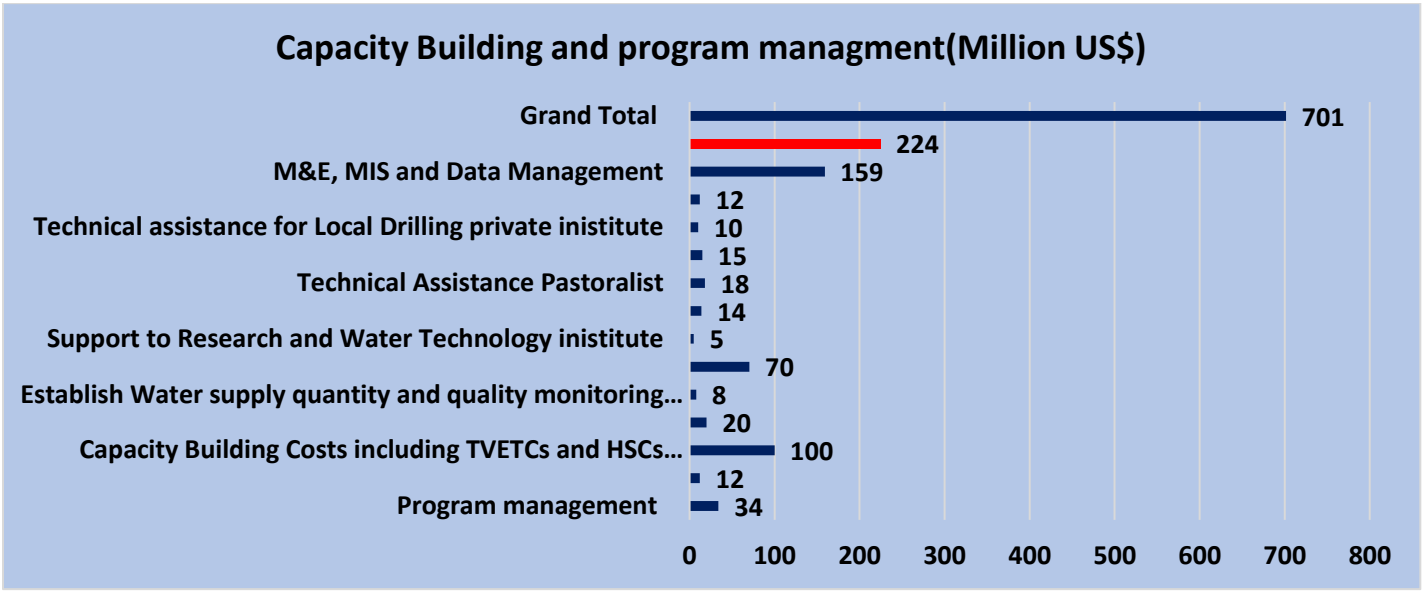


Figure 16-6: Summary cost for capacity building and program management cost

16.8.11 CR-WASH

Table 16-17: CR-WASH

No.	Activity	Oromiya	Amhara	Tigray	SNNP	Somali	Afar	Harari	Dire Dawa	Total
1	***Rural Water Supply***									
	2019	140	23	14	61	110	64	5	2	**418**
	2020	171	29	17	74	135	78	6	2	**511**
	Total	**311**	**52**	**30**	**135**	**245**	**141**	**11**	**4**	**929**
2	***Urban Water Supply***									
	2019	58	10	6	25	45	26	2	1	**173**
	2020	71	12	7	31	56	32	2	1	**211**
	Total	**128**	**21**	**13**	**56**	**101**	**58**	**4**	**2**	384
3	***Rural Sanitation***									
	2019	19	3	2	8	15	9	1	0	**57**
	2020	23	4	2	10	18	11	1	0	**69**
	Total	**42**	**7**	**4**	**18**	**33**	**19**	**1**	**1**	126
4	***Urban Sanitation***									
	2019	36	6	4	16	28	16	1	0	**107**
	2020	44	7	4	19	34	20	2	1	**131**
	Total	**80**	**13**	**8**	**35**	**63**	**36**	**3**	**1**	238
5	***For school and Health facility***									
	2019	38	6	4	16	30	17	1	1	**112**
	2020	46	8	5	20	36	21	2	1	**137**
	Total	**84**	**14**	**8**	**36**	**66**	**38**	**3**	**1**	250
6	***Capacity Building and Program Management***									
	2019	22	4	2	10	18	10	1	0	**67**
	2020	27	5	3	12	22	12	1	0	**82**
	Total	**50**	**8**	**5**	**22**	**39**	**23**	**2**	**1**	149
7	***Monitoring and evaluation***									
	2019	11	2	1	5	9	5	0	0	**34**
	2020	14	2	1	6	11	6	0	0	**41**
	Total	**25**	**4**	**2**	**11**	**20**	**11**	**1**	**0**	74
8	**Program management 0.5%**									
	2018									**1.08**
	2019									**4.84**
	2020									**5.38**
	Total									**11**
	Grand Total	**719**	**120**	**71**	**313**	**566**	**327**	**25**	**10**	**2161**

16.8.12 Summary of costs

Overall summary of OWNP Phase 2 costs are shown in **Figure 16.7** below. **Figure 16.8** indicates where the share of finance might come from and **Figure 16.9** indicates the estimated share to be funded from the CR-WASH initiative (Resilient and Sustainable Water Supply, Sanitation and Hygiene Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia, also termed "CR-WASH").

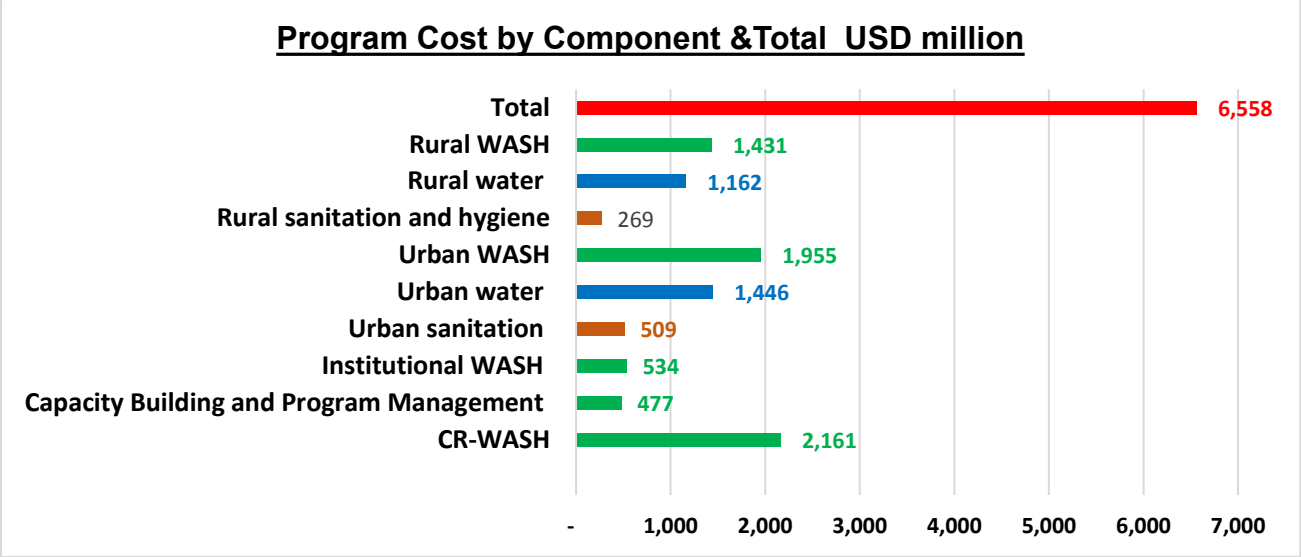


Figure 16-7: Phase 2 Program total costs and by sector

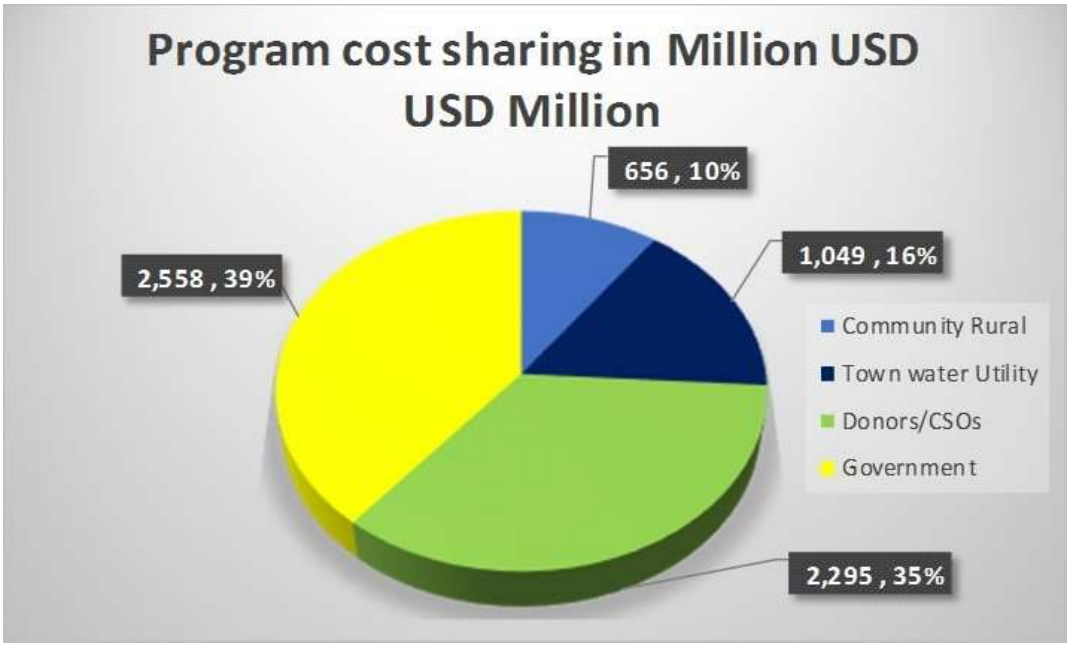


Figure 16-8: Total Program Cost and Cost Sharing

Note: Community contribution Rural 5% in Cash and 5% in labour and kind (such as pipeline trench excavation, local construction material Sand and stone etc. Town Water Utility from Loan which will be reimbursed from revenue of water sales.

Figure 16-9: Summary of CR-WASH (CR-WASH) Program Component Cost

17. OWNP program indicative medium to long-term plan

17.1 Introduction

As per the main objectives of OWNP supplying clean, safe and resilient water supply, improved sanitation and hygiene practice access and development will extend to 2030. The program used GTP2 goals and indicators during Phase 2.

Following completion of GTP2 targets under the directions recommended in **Section 9** (short to medium term), the next step will be to drive towards full WASH sector targets as recommended in **Section 10** (long term) and achievement of SDG goals, targets and indicators (or the equivalent best practice deemed appropriate for Ethiopia).

It is anticipated that this OWNP document 2018 will form the basis for development of GTP3 (2020-2025) and GTP4 (2026-2030). In designing this indicative plan for the program from 2020-2030 the following information, assumptions and goals of SDG are used.

17.2 Information used for the design

1. The indicative plan is designed based on SDG goal 6 and targets 6.1 and 6.2 which are:

   6.1; by 2030, achieve universal and equitable access to safe and affordable drinking water for all

   6.2; by 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations

2. CR-WASH Concept
3. OWNP phase II Planning Information
4. Proportion of served population at the end of GTPII is deducted from Population projections (drawn from CSA) in 2030
5. The unit cost is determined from average of SDG estimate (Country costing model for WASH) and OWNP phase II Unit Cost Estimate
6. The indicative total program cost distribution by regions based on population ratio
7. The program component cost is estimated based on the ratio determined from OWNP phase II program cost sharing
8. The escalation of the program cost is taken as 3 Birr per USD per year (International inflation rate normally does not exceed 2.5%)

17.3 Assumptions

1. The planned activities, organization including staffing, advocacy, capacity building, involvement of CSO and private sectors, procurement procedures etc. recommended and planned in Phase II are materialized
2. Regions have enough experience on different technologies and adjusting to robust and resilient technology
3. The fund utilization capacity of federal ministries and regions has improved
4. Government and donors are even more enthusiastic and ready to support OWNP
5. Planning encompassing the beneficiaries, frontline actors, partners and financiers
6. Involving the private sector
7. Capacity building of all involved in planning, construction, rehabilitation, monitoring and evaluation etc.
8. Empowering communities and local government
9. Strengthening the coordination and program management units of the OWNP organizations at all level
10. Establishing regulatory agency for water and sanitation (waste water) program

17.3 Indicative plan for period 2020-2030

The following tables indicate the goals, objectives, program indicators and target populations. Calculations used information from SDG goals and targets, CR WASH concepts and Phase II planning and design exercises. The indicative plans include population served and financial plan with different schemes.

Table 17-1: 2020-2025 Goals/Objective, Program indicators and Target population

	Goals 1 : By 2025, increase water supply access coverage with basic water supply services						
	Indicators /Years	**% of population using water supply with basic services**	**% of population using piped water supply with basic services**	**% of population using safely managed drinking water supply**	**Target # of unserved Rural population**	**Target # of unserved Urban population**	
	2021	86	30	14	13,477,004	5,273,583	
	2022	89	31	16	1,495,852	1,072,924	
	2023	92	32	18	1,525,902	1,126,470	
	2024	96	34	20	1,556,588	1,182,793	
	2025	100	35	22	1,587,924	1,242,039	
	Goal 2: By 2025, ensure good governance in rural water supply enhancing sustainability, effectiveness, efficiency and climate change resilience of the service.						
	Indicators/Years	**%rural water supply schemes found non-functional at any time**	**% of Woredas having spare parts supply chain services for rural water supply schemes maintenance**	**% of Woredas having water supply extension supporting system at Kebele level (WEWs)**	**% of Woredas with water quality monitoring system in place and rural water supply schemes with water safety plan**	**% of Woredas having the private sector and/or small and microenterprises involved in rural water supply O&M activates.**	
	2021	6.5	100	100	100	20	
	2022	6	100	100	100	30	
	2023	5.5	100	100	100	40	
	2024	5	100	100	100	50	
	2025	5	100	100	100	60	
	Goal 3: By 2025, ensure good governance in urban water supply enhancing sustainability, effectiveness, efficiency and climate change resilience of the service.						
	Indicators/Years I	**% of urban water supply utilities with NRW 20% or less (Percent)**	**% of urban water supply utilities with 16 hours/day or more continuity of water supply at premises.**	**% of urban water supply utilities meeting sustainability the tariff system target**	**% of urban water utilities meeting water safety target through water safety plan implementation & water quality monitoring among all categories (1-5) of water utilities.**	**The regulatory system capacitated and delivering its service throughout the country efficiently.**	**% of urban water supply utilities at least one of their services outsourced to the private sector**
	2021	38	14	100	20	1	100
	2022	46	18	100	40	1	100
	2023	54	22	100	60	1	100
	2024	62	26	100	80	1	100
	2025	70	30	100	100	1	100
	Goal 4: Build the sub-sectors' overall capacity.						
	Indicators/Years	***% of professionals trained and engaged into the sector**	**Establish independent water supply &wastewater service regulatory agency**	**Established and functional MIS System**	**% of WASH coordination structures established and functional from federal to Kebele level**		

	2021	20	1	1	60
	2022	40	1	1	70
	2023	60	1	1	80
	2024	80	1	1	90
	2025	100	1	1	100

*Training: 4,374 higher and 13,000 medium level professionals510,000 artisans and caretakers and women in this regard i 25% and more women involvement

Table 17-2: 2025-2030 Goals/Objective, Program indicators and Target population

	Goals 1 : By 2030, increase water supply access coverage with basic water supply services						
	Indicators /Years	**% of population using water supply with basic services**	**% of population using piped water supply with basic services**	**% of population using safely managed drinking water supply**	**Target # of unserved Rural population**	**Target # of unserved Urban population**	
	2026	100	37	23	1,619,924	1,304,365	
	2027	100	39	27	1,652,602	1,369,934	
	2028	100	41	31	1,685,975	1,438,919	
	2029	100	43	35	1,720,055	1,511,501	
	2030	100	45	39	1,754,861	1,587,872	
	Goal 2: By 2030, ensure good governance in rural water supply enhancing sustainability, effectiveness, efficiency and climate change resilience of the service.						
	Indicators/Years	**%rural water supply schemes found non-functional at any time**	**% of Woredas having spare parts supply chain services for rural water supply schemes maintenance**	**% of Woredas having water supply extension supporting system at Kebele level (WEWs)**	**% of Woredas with water quality monitoring system in place and rural water supply schemes with water safety plan**	**% of Woredas having the private sector and/or small and microenterprises involved in rural water supply O&M activates.**	
	2026	4.5	100	100	100	70	
	2027	4	100	100	100	80	
	2028	3	100	100	100	85	
	2029	2	100	100	100	90	
	2030	0	100	100	100	100	
	Goal 3: By 2030, ensure good governance in urban water supply enhancing sustainability, effectiveness, efficiency and climate change resilience of the service.						
	Indicators/Years l	**% of urban water supply utilities with NRW 20% or less (Percent)**	**% of urban water supply utilities with 16 hours/day or more continuity of water supply at premises.**	**% of urban water supply utilities meeting sustainability the tariff system target**	**% of urban water utilities meeting water safety target through water safety plan implementation & water quality monitoring among all categories (1-5) of water utilities.**	**The regulatory system capacitated and delivering its service throughout the country efficiently.**	**% of urban water supply utilities at least one of their services outsourced to the private sector**
	2026	75	32	100	20	1	100
	2027	80	34	100	40	1	100
	2028	85	36	100	60	1	100
	2029	90	38	100	80	1	100
	2030	100	40	100	100	1	100

	Goal 4: By 2030, build the sub-sectors' overall capacity.				
	Indicators/Years	***% of professionals refresher-trained and engaged into the sector**	**Strengthened independent water supply &wastewater service regulatory agency**	**Strengthened functional MIS System**	**% of WASH coordination structures Strengthened and functional from federal to Kebele level**
	2026	20	1	1	60
	2027	40	1	1	70
	2028	60	1	1	80
	2029	80	1	1	90
	2030	100	1	1	100

Table 17-3: Rural and Urban Water Supply indicative Access by Region and Year (%)

No.	Region/City	Base Year	Phase III					Phase Iv				
		2017	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Tigray											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
2	Gambella											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
3	B. Gumuz											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
4	Dire Dawa											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
5	Harari											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
6	Somali											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
7	Amhara											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
8	Afar											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
9	SNNPR											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
10	Oromiya											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	85	89	93	97	100	100	100	100	100	100
11	Addis Ababa											
	Urban	109	86	89	92	96	100	100	100	100	100	100
	Total	109	86	89	92	96	100	100	100	100	100	100
12	National											
	Rural	85	86	90	94	98	100	100	100	100	100	100
	Urban	75	78	84	90	96	100	100	100	100	100	100
	Total	83	86	89	92	96	100	100	100	100	100	100

Note: The indicative access coverage is projected based on history of GTP I and GTP 2 growth rate trend which is found to be 3-4%. The overall (ambitious) target is to at least meet 100% GTP2 targets achievement of all unserved population of the country and achieve as much as possible SDGs (or Ethiopian equivalent).

17.4 SDG goals

In order to reach the SDG goals the actions listed and described under **Section 10** (long term recommendations) will be required; in particular:

For Water Supply

1. Use high resilience water source from deep boreholes or surface water development
2. Use Low resilience water source from dug wells to rainwater harvesting (cisterns and hafir dams)
3. Use medium resilience water source from shallow well to deep well spot water supply
4. Use appropriate, easily managed water pumping technology such as solar pump system
5. Multi village schemes with deep well sources are preferable for resilient supply
6. Deep Borehole drilling supported with comprehensive study and design using cutting-edge technology
7. Focused more on catchment protection and environmental management
8. Water safety plan and Water quality management (from catchment up to house hold level), include Pipeline system water quality design in water supply network system design

For Rural Sanitation

1. Improved Pit Latrines
2. Ecosan types of latrines
3. Bio digesters

For Urban sanitation

1. Decentralized waste water management and treatment system
2. Onsite sanitation treatment system for marginalized community at the peripheries of the town
3. Conventional Central sewerage system

17.5 Indicative Financial Plan 2021-2030[81]

Table 17-4: Rural and Urban WASH component water supply part Unserved target population and estimation of per capital cost 2021-2030

Year	Rural Unserved target population	Urban Targeted population	SDG with 3% of annual inflation	OWNP phase II Unit cost average consider with 3 % of annual inflation	Average	Total program cost for Rural water	Total program cost for Urban water	Total program cost for Water supply in US$ million
2021	13,477,004	5,273,583	106	140	123	1,657,671,492	648,650,709	2,306.,32
2022	1,495,852	1,072,924	109	144	127	189,973,204	136,261,348	326.23
2023	1,525,902	1,126,470	112	148	130	198,367,260	146,441,100	344.80
2024	1,556,588	1,182,793	115	152	134	208,582,792	158,494,262	367.07
2025	1,587,924	1,242,039	113	150	132	209,605,968	163,949,148	373.55
Sub-Total	**19,643,270**	**9,897,809**				**2,464,200,716**	**1,253,796,567**	**3,717.99**
2026	1,619,924	1,304,365	122	160	141	228,409,284	183,915,465	412,324,749
2027	1,652,602	1,369,934	147	194	171	282,594,942	234,258,714	516,853,656
2028	1,685,975	1,438,919	151	199	175	295,045,625	251,810,825	546,856,450
2029	1,720,055	1,511,501	154	204	179	307,889,845	270,558,679	578,448,524
2030	1,754,861	1,587,872	158	209	184	322,894,424	292,168,448	615,062,872
Sub-Total	**8,433,417**	**7,212,591**	**732**	**966**	**850**	**1,436,834,120**	**1,232,712,131**	**2,669,546,251**

Table 0-5 :Table 17.5: program cost part of the Rural and Urban WASH component water supply 2021-2025

Year	Total program cost for Rural water	Total program cost for Urban water	Total program cost for Rural Sanitation (10%)	Total program cost for Urban sanitation (25%)	Total program cost for Total program cost for Institutional WASH (15%)	Total program cost for Capacity Building and Program Management (18%)	CR-WASH (83%)	Total US$ million
2021	1,657,671,492	648,650,709	230,632,220.1	576,580,550	345,948,330.15	158,270,927	1,914,247,426.83	5,532.00
2022	189,973,204	136,261,348	32,623,455.2	81,558,638	48,935,182.80	30,399,265	270,774,678.16	790.53
2023	198,367,260	146,441,100	34,480,836.0	86,202,090	51,721,254.00	32,565,948	286,190,938.80	835.97
2024	208,582,792	158,494,262	36,707,705.4	91,769,264	55,061,558.10	35,136,354	304,673,954.82	890.43
2025	209,605,968	163,949,148	37,355,511.6	93,388,779	56,033,267.40	36,234,839	310,050,746.28	906.62
Total	2,464,200,716	1,253,796,567	**371,799,728**	**929,499,321**	**557,699,592**	**292,607,333**	**3,085,937,745**	8,955.54

Table 17-6: Program part of the Rural and Urban WASH component water supply 2026-2030

Yearly	Total program cost for Rural water	Total program cost for Urban water	Total program cost for Rural Sanitation (10%)	Total program cost for Urban sanitation (25%)	Total program cost for Total program cost for Institutional WASH (15%)	Total program cost for Capacity Building and Program Management (18%)	CR-WASH (83%)	Total US$ million
2026	228,409,284	183,915,465	41,232,474.9	103,081,187.25	61,848,712.35	40,526,629	342,229,541.67	1,001.24
2027	282,594,942	234,258,714	51,685,365.6	129,213,414.00	77,528,048.40	51,469,934	428,988,534.48	1,255.74
2028	295,045,625	251,810,825	54,685,645.0	136,714,112.50	82,028,467.50	55,169,365	453,890,853.50	1,329.34
2029	307,889,845	270,558,679	57,844,852.4	144,612,131.00	86,767,278.60	59,112,636	480,112,274.92	1,406.90
2030	322,894,424	292,168,448	61,506,287.2	153,765,718.00	92,259,430.80	63,661,452	510,502,183.76	1,496.76
Total	1,436,834,120	1,232,712,131	**266,954,625**	**667,386,563**	**400,431,938**	**269,940,016**	**2,215,723,388**	6,489.98

[81] The indicated spend of around USD 1.8 billion per year for first 5 years and around USD 1.3 billion per year for the second 5 years is reasonably consistent with GTP2 cost forecasts (**Section 16**) and what has been calculated elsewhere (UNICEF) to achieve SDGs

Annex 1: Planning Assumptions

The following tables show the underlying assumptions used in determining the Program's physical and financial requirements:

Table A1-1 Urban Population of Regions as per the Census Data of CSA for 2007

Region		Year				average population increase 2014-2017	2018	2019	2020	2032
Region	Baseline Population for 2007 EFY	2014	2015	2016	2017		*Assuming "average population increase 2014-2017" continues uniformly until 2032*			Ratio of design population 2032 to 2020
Tigray	1011407	1,200,000	1,264,000	1,331,000	1,400,000	5.3%	1,473,818	1,551,527	1,633,334	1.85
Afar	104606	289,000	308,000	327,000	346,000	6.2%	367,399	390,120	414,248	1.85
Amhara	2107135	3,127,000	3,307,000	3,492,000	3,682,000	5.6%	3,888,088	4,105,711	4,335,515	1.92
Oromiya	2773896	4,647,000	4,880,000	5,105,000	5,354,000	4.8%	5,612,816	5,884,144	6,168,587	1.76
Benishangul	49009	189,000	202,000	215,000	230,000	6.8%	245,556	262,165	279,896	2.19
SNNP	1171772	2,707,000	2,856,000	3,018,000	3,178,000	5.5%	3,352,557	3,536,703	3,730,962	1.90
Gambela	64670	83,639	89,037	140,000	148,000	6.1%	157,004	166,557	176,690	2.03
Harar	123789	125,000	129,000	133,000	137,000	3.1%	141,251	145,633	150,152	1.44
Somali	723866	763,000	788,000	813,000	838,000	3.2%	864,604	892,053	920,373	1.46
Diredawa (35l/c/d)	283656	134,000	277,000	285,000	293,000	2.8%	301,343	309,924	318,749	1.40
Addis Ababa from AAWSA sheet	3213295	3,195,000	3,273,000	3,352,000	3,434,000	2.4%	3,517,576	3,603,185	3,690,878	1.33
SPECIAL ENUMERATION		41,000	43,000	45,000	46,000	3.9%	47,802	49,674	51,620	1.59
Totals	**11,627,103**	**16,500,639**	**17,416,037**	**18,256,000**	**19,086,000**	**5.0%**	**19,969,814**	**20,897,396**	**21,871,006**	**1.73**

Table A1-2 Rural Population of Regions as per the Census Data of CSA for 2008

Region	Year					average population increase 2014-2017	2018	2019	2020	2032
	Baseline Population for 2007 EFY	2014	2015	2016	2017		*Assuming "average population increase 2014-2017" continues uniformly until 2032*			Ratio of design population 2032 to 2020
Tigray	4,293,401	3,760,000	3,792,000	3,821,000	3,847,000	0.8%	3,876,459	3,906,124	3,934,359	1.10
Afar	1,511,776	1,389,000	1,415,000	1,442,000	1,466,000	1.8%	1,491,920	1,519,344	1,545,951	1.24
Amhara	17,763,549	16,892,000	17,092,000	17,278,000	17,453,000	1.1%	17,644,707	17,837,621	18,025,467	1.14
Oromiya	31,218,105	28,169,000	28,812,000	29,470,000	30,113,000	2.2%	30,785,202	31,480,338	32,179,185	1.31
Benishangul	1,245,768	787,000	803,000	819,000	836,000	2.0%	853,175	870,438	888,278	1.27
SNNP	18,167,901	15,130,000	15,420,000	15,701,000	15,992,000	1.9%	16,293,458	16,595,486	16,903,089	1.25
Gambela	365,546	272,000	277,000	282,000	288,000	1.9%	293,711	299,274	305,292	1.26
Harar	104,703	101,000	103,000	107,000	109,000	2.6%	111,098	114,324	117,053	1.36
Somali	4,441,023	4,544,000	4,665,000	4,785,000	4,911,000	2.6%	5,041,045	5,172,626	5,308,238	1.36
Diredawa (35l/c/d)	132,096	159,000	163,000	168,000	173,000	2.9%	177,751	182,917	188,298	1.40
SPECIAL ENUMERATION		75,000	75,000	77,000	77,000	**0.9%**	77,000	78,027	78,547	1.11
Total	**79,243,868**	**71278000**	**72617000**	**73950000**	**75265000**	**1.8%**	**76645525**	**78056519**	**79473756**	**1.25**

Notes (Tables A1-1 and **A1-2):** The population projection figures are based on the results of National population and Housing Census of Ethiopia conducted in May 2007. The base population for the projection was obtained from the 2007 Population and Housing Census for each of the regions and adjusted to the mid of the census year, 1 July 2007. Up to 2017 population projection figures at woreda and Zonal levels are prepared and printed on yearly Statistical Abstract of the Agency. Population figure from year 2018- 2032 is projected by Geometrical increase method assuming % increase in population of all regions from year 2014-2017 remain constant.

Table A1-3 Rural water supply scheme beneficiaries per scheme derived from Government (CWA), DP and CSO projects

Water supply Systems	Beneficiaries per Scheme by Region										
	Tigray	Gambella	B-Gumuz	Harari	Somali	Amhara	Afar	SNNP	Oromiya	Diredawa	Average
Household Dug well with Rope Pump	7	6	6	6	3	6	6	7	7	6	6
Community Dug well with Rope Pump	10	19	33	38	33	32	33	54	54	42	35
Dug well with Hand Pump	171	135	115	193	150	188	185	234	166	171	171
Shallow well with hand pump	237	237	236	280	300	274	350	260	217	320	271
Shallow well with solar system (small on spot)	237	237	236		300	274	350	260	217	320	270
Borehole with distribution (small on spot)	1,250	1250	1250	1800	1800	1250	2000	1500	1500	2000	1560
Borehole with distribution (on spot) + solar	1,250	1250	1250	1800	1800	1250	2000	1500	1500	2000	1560
Capped Spring	253	200	188	263	175	271	175	287	256	350	242

Water supply Systems	Beneficiaries per Scheme by Region										
	Tigray	Gambella	B-Gumuz	Harari	Somali	Amhara	Afar	SNNP	Oromiya	Diredawa	Average
Rain water harvesting	300	249	44	50	45	300	44	300	72	737	214
Cistern	150	127	44	50	45		44	72	72	57	73
Hafir Dam		2225	222	250	493		222		359	493	609
Single village from spring source + gravity distribution with 2 -4 water points (small)	1,650	1400	1450	1450	1500	1395	1350	1445	1479	1400	1452
Single village from spring source + motorized distribution with 2 water points (small)	1,450	1300	1400	1400	1000	2000	1200	1800	2000	1444	1499
Single vllage from spring source + motorized distribution with 2 water points + **solar**	3,000	3000	3000	1400		3000	1200	1800	2000	1444	2205
Multi village from spring source + gravity distribution with 4-6 water points (medium)	3,000	3300	3200	3200	2200	3500	3000	3800	4200	3200	3260
Multi village from spring source + gravity distribution with 6-10 water points (large)	8,100	9228	8100	8100	4500	8500	6500	10200	11000	8100	8233
Multi village from spring source + motorized distribution with 4-6 water points (medium)	5,500	3300	3200	3200	2200	3500	3000	3800	4200	3200	3510
Multi village from spring source + motorized distribution with 6-10 water points (large)	8,100	8350	8100	8100	4500	8500	6500	10200	11000	8100	8145
Multi village from spring source + motorized distribution with 4-10 water points + **solar**		8350				8500					8425
Single village borehole source + distribution for 4-6 water points (medium)	6,500	3000	3000	3500	4000	3000	4000	3000	3000	3500	3650
Single village borehole source + distribution for 4-6 water points + **Solar**	6,500	3000		3500	4000	3000	4000	3000	3000		3750
Multi village from borehole source with 5-8 km distribution (large)	7,799	7921	8500	8000	6500	12500	7000	11000	10500	8000	8772
Multi village from borehole source with 5-8 km distribution + **Solar**	7,799	7921				12500					9407
Large multi village from one or more very deep boreholes with long km distribution	10,000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Single village from river source with treatment				3500							3500
Multi village from river source with treatment					6500	12500			10000		9667

Table A1-4: Number of maximum beneficiaries per scheme that could access safe water supply by each type of rural water supply schemes as per GTP-1 and GTP-2 rural water supply access standards

Sr No	Types of water sources/ water scheme	National Standard for GTP-1	National Standard for GTP-2
1	Hand dug well (Household)	6	6
2	Hand dug well (community) Average depth 10 m	75	50
3	Modern hand dug well. Av. Depth 15m	270	160
4	Spring on the spot (onsite)	338	200
5	Spring development (with motor or gravity system)	900	550
6	Motor fitted spring	2,500	1500
7	Gravity system spring	5,000	3000
8	Medium spring	5,000	3000
9	Shallow well (with hand/manual pump)	425	250
10	Shallow well (with motor pump)	2,400	1450
11	Deep well	3,313	2000
12	Others (purified surface water)	28,756	17000
13	Shallow well (with solar pump)	1,750	1000
14	Shallow well (wind mill)	1,750	1000
15	Cistern (with wall)	50	30
16	Pond (with manual pump)	350	210
17	Cistern (with plastic lining)	117	70

Note:

1. GT-2 standards system types do not coincide with the technology types actually used by regions so we have considered average beneficiaries per schemes from different stakeholder CSO, DP and Government water sectors programs.
2. CWA projects are mainly implemented by WASH sector offices.
3. The accurate beneficiaries from spring, deep well, and surface water except hand pump fitted scheme will be determined during feasibility study and design stage based on the actual yield from water quantity measurement and pumping tests.

Table A1-5: Unit rate USD per capita per water supply system

Water supply Systems	Unit cost per capita per scheme by Region										
	Tigray	Gambella	B/Gumuz	Harari	Somali	Amhara	Afar	SNNP	Oromiya	Diredawa	Average
Household Dug well with Rope Pump	112	133	133	133	224	164	133	112	112	133	139
Community Dug well with Rope Pump	78	47	38	32	44	37	44	21	21	32	39
Dug well with Hand Pump	27	34	30	19	20	26	21	25	23	25	25
Shallow well with hand pump	44	95	41	71	89	45	56	47	41	127	66
Shallow well with **solar** system (small on spot)	44	95	41		89	45	56	47	41	127	65

Water supply Systems	Unit cost per capita per scheme by Region										
	Tigray	Gambella	B/Gumuz	Harari	Somali	Amhara	Afar	SNNP	Oromiya	Diredawa	Average
Borehole with distribution (small on spot)	125	135	115	117	211	125	151	140	134	110	136
Borehole with distribution (on spot) + **solar**	125	135		117		125	151	140	134	110	130
Capped Spring	21	30	31	27	43	19	30	19	20	25	27
Rain water harvesting	45	40	39	32	40	45	44	45	21	29	38
Cistern	45	140	106	89	118		120	59	90	90	95
Hafir Dam		13	105	89	98		119		59	98	83
Single village from spring source + gravity distribution with 2 -4 water points (small)	39	96	66	68	104	34	103	35	35	41	62
Single village from spring source + motorized distribution with 2 water points (small)	75	117	105	109	268	58	186	92	81	130	122
Single village from spring source + motorized distribution with 2 water points + solar	52	52	52	52		52	52	52	52	52	52
Multi village from spring source + gravity distribution with 4-6 water points (medium)	79	49	48	52	173	38	97	51	44	55	68
Multi village from spring source + gravity distribution with 6-10 water points (large)	39	108	37	35	114	34	65	32	31	38	53
Multi village from spring source + motorized distribution with 4-6 water points (medium)	54	69	69	73	203	58	76	68	60	76	80
Multi village from spring source + motorized distribution with 6-10 water points (large)	47	41	45	44	129	42	76	38	35	46	54
Multi village from spring source + motorized distribution with 4-10 water points + solar		52				52					52
Single village borehole source + distribution for 4-6 water points (medium)	88	105	79	97	164	75	129	107	104	101	105
Single village borehole source + distribution for 4-6 water points + Solar	88	105		97	164	75	129	107	104		109
Multi village from borehole source with 5-8 km distribution (large)	84	39	50	73	148	77	112	51	52	74	76
Multi village from borehole source with 5-8 km distribution + Solar	84	39				77					67
Large multi village from one or more very deep boreholes with long km distribution	133	134	140	134	145	127	145	127	127	134	135
Single village from river source with treatment				118							118
Multi village from river source with treatment	118	118	118	118	118	118	118	118	118	118	118

Note: GT-2 standards system types do not coincide with the technology types actually used by regions so we have considered average unit costs per beneficiary per scheme from different stakeholder (CSO, DP, CWA and Government) water sectors programs.

Annex 2: Scenario 1 - Regional proposed technology mix and number of schemes

Scenario 1 spreadsheets include the numbers of schemes and technology mix exactly as proposed by the regions. However, the resultant total costs may vary from the total cost figures from the regions since this analysis uses averages of unit rates as well as numbers of beneficiaries per technology type derived from various sources

All regions

The working Regional Rural Water spreadsheet "tool" is based on:

- Number of systems proposed for each technology by each region (Column 3 in spreadsheets reproduced below)
- Average population served by each technology is calculated for each region (Column 6)
- Unit cost per capita for each technology in each region (Column 9)
- Unserved population to reach 85% GTP2 coverage by 2020, based on MoWIE 2009EFY report

Rural water supply analysis methodology

Each region has given an estimate of total "unserved population to be planned for the remaining 3 Years" in the region, for each of rural and urban water supply, as well as needs for institutional WASH (health and education) and for capacity building. However, in the majority of cases, these populations do not align with the unserved population figures described under **Sub-section 16.7** and summarized in **Table 16.2,** reproduced below. The unserved 2020 populations have been calculated based on MoWIE estimates of GTP2 water supply coverage.

Table A2-1 Rural Population by 2020

Population to be served by 2020
783,642
660,222
2,038,169
9,076,728
253,437
6,266,079
47,530
28,645
1,236,365
19,923
20,410,739

No of Beneficiaries in rural areas in water supply access during Phase II

Table A2-2 Tigray Region

It can be seen that, for Tigray region, for **Scenario 1** (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **783,642**
2. The numbers of systems proposed by the region will serve a (here calculated) **219%** of the actual rural water need (1)

The cost calculated using this tool is **USD 112 million** to serve a rural population of **1.7 million people** (219% of the need), while the original proposal from the region was **USD 70 million** to serve a population of **2.1 million people** (using their own unit rates and population served per technology)

Technology mix for rural water

Tigray region

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**783,642**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD
Self supply	1	Household Dug well with Rope Pump	924	924	100%	7	6,468	0.8%	112	723,490
	2	Community Dug well with Rope Pump	0	0		10	0	0.0%	78	0
On spot	3	Dug well with Hand Pump	837	837	100%	171	143,127	18.3%	27	3,828,681
	4	Shallow well with hand pump	2,557	2,557	100%	237	604,731	77.2%	44	26,844,884
	5	Shallow well with **solar** system (small on spot)	0	0			0			0
	6	Borehole with distribution (small on spot)	80	80		1,250	100,000	12.8%	125	12,527,964
	7	Borehole with distribution (on spot) + **solar**	0	0		1,250	0			0
	8	Capped Spring	414	414	100%	253	104,742	13.4%	21	2,171,904
	9	Rain Water harvesting	0	0		300	0		45	0
	10	Cistern	0	0		150	0		45	0
	11	Hafir Dam	0	0			0			0
		Other		0			0			0
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	0	0		1,650	0	0.0%	39	0
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,450	0		75	0
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0	0%	3,000			52	0
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,000	0	0.0%	79	0
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		8,100	0		39	0
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		5,500	0		54	0
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		8,100	0		47	0
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	90	90		6,500	585,000	74.7%	88	51,679,393
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	22	22	100%	7,799	171,571	21.9%	84	14,490,591
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0	0%					0
	15c	Large multi village from one or more very deep boreholes with long km distribution		0	0%	10,000			133	0
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		118	0
		Other								0
		Totals	**4,924**	**4,924**			**1,715,638**	**218.9%**		**112,266,907**

A2-3 Gambella Region

It can be seen that, for Gambella region, for Scenario 1 (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **47,520**
2. The numbers of systems proposed by the region will serve a (here calculated) **342%** of the actual rural water need (1)
3. The cost calculated using this tool is **USD 14 million** to serve a rural population of **162 thousand people** (342% of the need), while the original proposal from the region **was USD 11.4 million** to serve a population of **156 thousand people** (using their own unit rates and population served per technology)

Technology mix for rural water

Gambella region

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**47,530**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD
Self supply	1	Household Dug well with Rope Pump	650	650	100%	6	3,835	8.1%	133	509,999
	2	Community Dug well with Rope Pump	0	0		19	0		47	0
On spot	3	Dug well with Hand Pump	163	163	100%	135	22,005	46.3%	34	754,357
	4	Shallow well with hand pump	238	238	100%	237	56,287	118.4%	95	5,322,697
	5	Shallow well with **solar** system (small on spot)	111	111	100%	237	26,252	55.2%	95	2,482,434
	6	Borehole with distribution (small on spot)	0	0		1,250	0		135	0
	7	Borehole with distribution (on spot) + **solar**	0	0		1,250	0		135	0
	8	Capped Spring	34	34	100%	200	6,811	14.3%	30	206,456
	9	Rain Water harvesting	0	0		249	0		40	0
	10	Cistern	0	0		127	0		140	0
	11	Hafir Dam	0	0		2,225	0		13	0
		Other		0			0			0
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	8	8	100%	1,400	11,200	23.6%	96	1,072,908
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,300	0		117	0
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0		3,000			52	0
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,300	0		49	0
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		9,228	0		108	0
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,300	0		69	0
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		8,350	0		41	0
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	12	12		3,000	36,000	75.7%	105	3,782,937
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	0	0		7,921	0		39	0
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0			0			0
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000	0		134	0
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		118	0
		Other								0
		Totals	**1,216**	**1,216**			**162,390**	**341.7%**		**14,131,786**

A2-4 Gumuz Region

It can be seen that, for B Gumuz region, for **Scenario 1** (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **253,437**
2. The numbers of systems proposed by the region will serve a (here calculated) **105%** of the actual rural water need (1)
3. The cost calculated using this tool is **USD 12.5 million** to serve a rural population of **0.25 million** (105% of the need), while the original proposal from the region was **USD 17.7 million** to serve a population of **0.24 million** (using their own unit rates and population served per technology)

Technology mix for rural water

B Gumuz region

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**253,437**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	0	0		6	0		133	0	
	2	Community Dug well with Rope Pump	0	0		33	0		38	0	
On spot	3	Dug well with Hand Pump	120	120	100%	115	13,800	5.4%	30	416,311	
	4	Shallow well with hand pump	624	624	100%	236	147,264	58.1%	41	6,034,378	
	5	Shallow well with **solar** system (small on spot)	10	10	100%	236	2,360	0.9%	41	96,705	
	6	Borehole with distribution (small on spot)	0	0		1,250	0		115	0	
	7	Borehole with distribution (on spot) + **solar**	0	0		1,250	0			0	
	8	Capped Spring	24	24	100%	188	4,500	1.8%	31	140,042	
	9	Rain Water harvesting	0	0		44	0		39	0	
	10	Cistern	0	0		44	0		106	0	
	11	Hafir Dam	0	0		222	0		105	0	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	0	0		1,450	0		66	0	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,400	0		105	0	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0		3,000	0		52	0	from Tigray
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,200	0		48	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		8,100	0		37	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,200	0		69	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		8,100	0		45	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	10	10	100%	3,000	30,000	11.8%	79	2,371,365	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	8	8	100%	8,500	68,000	26.8%	50	3,400,447	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0	0%					0	
	15c	Large multi village from one or more very deep boreholes with long km distribution		0	0%	10,000			140	0	figures from Coffey? *Check CR WASH sheets*
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0	
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		115	0	
		Other								0	
		Totals	**796**	**796**			**265,924**	**104.9%**		**12,459,248**	

A2-5 Harari Region

It can be seen that, for Harari region, for **Scenario 1** (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **28,645**
2. The numbers of systems proposed by the region will serve a (here calculated) **385%** of the actual rural water need (1)
3. The cost calculated using this tool is **USD 9.0 million** to serve a rural population of **110,300** (385% of the need), while the original proposal from the region was **USD 1.3 million** to serve a population of **0.05 million** (using their own unit rates and population served per technology)

Technology mix for rural water

Harari region

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**28,645**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	0	0		6	0		133	0	
	2	Community Dug well with Rope Pump	0	0		38	0		32	0	
On spot	3	Dug well with Hand Pump	20	20	100%	193	3,850	13.4%	19	72,094	
	4	Shallow well with hand pump	0	0		280	0		71	0	
	5	Shallow well with **solar** system (small on spot)	0	0			0			0	
	6	Borehole with distribution (small on spot)	4	4	100%	1,800	7,200	25.1%	117	841,163	
	7	Borehole with distribution (on spot) + **solar**	0	0			0			0	
	8	Capped Spring	0	0		263	0		27	0	
	9	Rain Water harvesting	0	0		50	0		32	0	
	10	Cistern	0	0		50	0		89	0	
	11	Hafir Dam	0	0		250	0		89	0	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	5	5	100%	1,450	7,250	25.3%	68	490,439	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,400	0		109	0	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0		3,000			52	0	from Tigray
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,200	0		52	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		8,100	0		35	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,200	0		73	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		8,100	0		44	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	4	4	100%	3,500	14,000	48.9%	97	1,360,179	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	8	8	100%	8,000	64,000	223.4%	73	4,671,141	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0	
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			134	0	
16. Single Village - river	16	Single village from river source with treatment	4	4	100%	3,500	14,000	48.9%	115	1,611,576	
17. Multi Village -	17	Multi village from river source with treatment	0	0		0	0		115	0	
		Other								0	
		Totals	**45**	**45**			**110,300**	**385.1%**		**9,046,592**	

A2-6 Somali Region

It can be seen that, for Somali region, for **Scenario 1** (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **1,236,365**
2. The numbers of systems proposed by the region will serve a (here calculated) **145%** of the actual rural water need (1)
3. The cost calculated using this tool is **USD 222 million** to serve a rural population of **1.8 million** (145% of the need), while the original proposal from the region was **USD 335 million** to serve a population of **1.09 million** (using their own unit rates and population served per technology)

Technology mix for rural water

Somali region

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	1,236,365

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	0	0		3	0		224	0	
	2	Community Dug well with Rope Pump	1,780	1,780	100%	33	58,740	4.8%	44	2,570,320	
On spot	3	Dug well with Hand Pump	670	670	100%	150	100,500	8.1%	20	1,998,509	
	4	Shallow well with hand pump	0	0		300	0		89	0	
	5	Shallow well with **solar** system (small on spot)	163	163	100%	300	48,900	4.0%	89	4,375,839	
	6	Borehole with distribution (small on spot)	0	0		1,800	0		211	0	
	7	Borehole with distribution (on spot) + **solar**	0	0		1,800	0			0	
	8	Capped Spring	65	65	100%	175	11,375	0.9%	43	494,407	
	9	Rain Water harvesting	2430	2,430	100%	45	109,350	8.8%	40	4,348,993	
	10	Cistern	967	967	100%	45	43,515	3.5%	118	5,120,265	
	11	Hafir Dam	94	94	100%	493	46,300	3.7%	98	4,558,347	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	0	0		1,500	0		104	0	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,000	0		268	0	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0						0	
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		2,200	0		173	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		4,500	0		114	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		2,200	0		203	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		4,500	0		129	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	96	96	100%	4,000	384,000	31.1%	164	63,140,940	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	98	98	100%	6,500	637,000	51.5%	148	94,272,931	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0	
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			145	0	
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0	
17. Multi Village -	17	Multi village from river source with treatment	55	55	100%	6,500	357,500	28.9%	115	41,152,741	
		Other								0	
		Totals	**6,418**	**6,418**			**1,797,180**	**145.4%**		**222,033,291**	

A2-7 Amhara Region

It can be seen that, for Amhara region, for **Scenario 1** (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **2,038,169**
2. The numbers of systems proposed by the region will serve a (here calculated) **307%** of the actual rural water need (1)
3. The cost calculated using this tool is **USD 141 million** to serve a rural population of **6.2 million people** (307% of the need), while the original proposal from the region was **USD 223 million** to serve a population of **4.3 million people** (using their own unit rates and population served per technology)

		Technology mix for rural water								
		Amhara region								
		Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY				2,038,169				
Type		**Technology**	**No. of systems proposed by Region**	**Adjusted No. of systems**	**Adjust-ment %age**	**Av. population served per system in this region**	**Adjusted regional population to be served by this system**	**Proportion of unserved population**	**Unit cost per capita USD**	**Total cost USD**
Self supply	1	Household Dug well with Rope Pump	1,260	1,260	100%	6	6,930	0.3%	164	1,136,913
	2	Community Dug well with Rope Pump	1,720	1,720	100%	32	55,040	2.7%	37	2,044,599
On spot	3	Dug well with Hand Pump	12,000	12,000	100%	188	2,253,600	110.6%	26	58,883,836
	4	Shallow well with hand pump	1,500	1,500	100%	274	411,414	20.2%	45	18,669,664
	5	Shallow well with **solar** system (small on spot)	0	0			0			0
	6	Borehole with distribution (small on spot)	0	0		1,250	0	0.0%	125	0
	7	Borehole with distribution (on spot) + **solar**	0	0		1,250				0
	8	Capped Spring	9,000	9,000	100%	271	2,439,000	119.7%	19	47,299,978
	9	Rain Water harvesting		180	#DIV/0!	300	54,000	2.6%	45	2,416,107
	10	Cistern	0	0						
	11	Hafir Dam	0	0						
		Other		0			0			0
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	0	0		1,395	0	0.0%	34	0
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		2,000	0		58	0
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0	0%	3,000			52	0
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	80	80	100%	3,500	280,000	13.7%	38	10,738,255
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0	0%	8,500	0		34	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0	0%	3,510	0		90	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0	0%	8,500	0		42	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0	0%					
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	0			4,363	0		109	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**								
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	60	60	100%	12,500	750,000	36.8%	92	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**			0%					
	15c	Large multi village from one or more very deep boreholes with long km distribution			0%	10,000			127	
16. Single Village - river	16	Single village from river source with treatment	0				0			
17. Multi Village -	17	Multi village from river source with treatment	0				0		118	
		Other								
		Totals	**25,620**				**6,249,984**	**306.6%**		**141,189,353**

A2-8 Afar Region

It can be seen that, for Afar region, for **Scenario 1** (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **660,222**
2. The numbers of systems proposed by the region will serve a (here calculated) **85%** of the actual rural water need (1)
3. The cost calculated using this tool is **USD 65 million** to serve a rural population of **0.56 million people** (85% of the need), while the original proposal from the region was **USD 77 million** to serve a population of **0.53 million** (using their own unit rates and population served per technology)

Technology mix for rural water

Afar region

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	660,222

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD
Self supply	1	Household Dug well with Rope Pump	0	0		6	0		133	0
	2	Community Dug well with Rope Pump	0	0		33	0		44	0
On spot	3	Dug well with Hand Pump	148	148	100%	185	27,380	4.1%	21	588,027
	4	Shallow well with hand pump	96	96	100%	350	33,600	5.1%	56	1,866,618
	5	Shallow well with **solar** system (small on spot)	53	53	100%	350	18,550	2.8%	56	1,030,529
	6	Borehole with distribution (small on spot)	0	0		2,000	0		151	0
	7	Borehole with distribution (on spot) + **solar**	0	0		2,000	0		151	0
	8	Capped Spring	7	7	100%	175	1,225	0.2%	30	36,422
	9	Rain Water harvesting	40	40	100%	44	1,760	0.3%	44	77,000
	10	Cistern	163	163	100%	44	7,172	1.1%	120	863,085
	11	Hafir Dam	7	7	100%	222	1,554	0.2%	119	185,339
		Other		0			0			0
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	0	0		1,350	0		103	0
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,200	0		186	0
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0		1,200			52	0
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,000	0		97	0
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		6,500	0		65	0
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,000	0		76	0
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		6,500	0		76	0
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	117	117		4,000	468,000	70.9%	129	60,201,342
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	0	0		7,000	0		112	0
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			145	0
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		118	0
		Other								0
		Totals	**631**	**631**			**559,241**	**84.7%**		**64,848,362**

A2-9 SNNP Region

It can be seen that, for SNNP region, for **Scenario 1** (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **6,266,079**
2. The numbers of systems proposed by the region will serve a (here calculated) **75%** of the actual rural water need (1)
3. The cost calculated using this tool is **USD 274 million** to serve a rural population of **4.7 million people** (75% of the need), while the original proposal from the region was **USD 371 million** to serve a population of **13.2 million** (using their own unit rates and population served per technology)

Technology mix for rural water

SNNPR region

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**6,266,079**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD
Self supply	1	Household Dug well with Rope Pump	0	0		7	0	0.0%	112	0
	2	Community Dug well with Rope Pump	2,166	2,166	100%	54	116,964	1.9%	21	2,501,730
On spot	3	Dug well with Hand Pump	1,296	1,296	100%	234	303,005	4.8%	25	7,709,732
	4	Shallow well with hand pump	4,659	4,659	100%	260	1,210,296	19.3%	47	56,370,477
	5	Shallow well with **solar** system (small on spot)	0	0			0			0
	6	Borehole with distribution (small on spot)	0	0		1,500	0		140	0
	7	Borehole with distribution (on spot) + **solar**	0	0		1,500	0		140	0
	8	Capped Spring	3,332	3,332	100%	287	955,729	15.3%	19	17,762,375
	9	Rain Water harvesting	0	0		300	0		45	0
	10	Cistern	0	0		72	0		59	0
	11	Hafir Dam	0	0			0			0
		Other		0			0			0
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	344	344	100%	1,445	497,208	7.9%	35	17,622,186
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,800	0		92	0
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0		1,800			52	0
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,800	0		51	0
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		10,200	0		32	0
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,800	0		68	0
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		10,200	0		38	0
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	534	534	100%	3,000	1,602,000	25.6%	107	172,026,846
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	0	0		11,000	0		51	0
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			127	0
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		118	0
		Other								0
		Totals	**12,331**	**12,331**			**4,685,202**	**74.8%**		**273,993,345**

A2-10 Oromiya Region

It can be seen that, for Oromiya region, for **Scenario 1** (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **9,076,728**
2. The numbers of systems proposed by the region will serve a (here calculated) **57%** of the actual rural water need (1)
3. The cost calculated using this tool is **USD 295 million** to serve a rural population of **5.1 million people** (57% of the need), while the original proposal from the region was **USD 254million** to serve a population of **4.6 million people** (using their own unit rates and population served per technology)

Technology mix for rural water

Oromia region

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**9,076,728**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD
Self supply	1	Household Dug well with Rope Pump	0	0		7	0		112	0
	2	Community Dug well with Rope Pump	0	0		54	0		21	0
On spot	3	Dug well with Hand Pump	5,875	5,875	100%	166	972,900	10.7%	23	22,372,502
	4	Shallow well with hand pump	1,461	1,461	100%	217	316,953	3.5%	41	13,034,585
	5	Shallow well with **solar** system (small on spot)	0	0			0			0
	6	Borehole with distribution (small on spot)	0	0		1,500	0		134	0
	7	Borehole with distribution (on spot) + **solar**	0	0		1,500	0		134	0
	8	Capped Spring	4,827	4,827	100%	256	1,236,402	13.6%	20	24,881,648
	9	Rain Water harvesting	0	0		72	0		21	0
	10	Cistern	0	0		72	0		90	0
	11	Hafir Dam	0	0		359	0		59	0
		Other	0	0			0			0
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	372	372	100%	1,479	550,079	6.1%	35	19,181,856
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		2,000	0		81	0
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0		2,000			52	0
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		4,200	0	0.0%	44	0
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		11,000	0		31	0
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		4,200	0		60	0
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		11,000	0		35	0
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	687	687	100%	3,000	2,061,000	22.7%	104	215,167,785
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	0	0		10,500	0		52	0
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			127	0
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		118	0
		Other								0
		Totals	**13,222**	**13,222**			**5,137,333**	**56.6%**		**294,638,377**

A2-11 Dire Dawa Region

It can be seen that, for Dire Dawa region, for **Scenario 1** (unadjusted):

1. Unserved population to reach 85% GTP2 coverage by 2020 = **19,923**
2. The numbers of systems proposed by the region will serve a (here calculated) **552%** of the actual rural water need (1)
3. The cost calculated using this tool is **USD 10.5 million** to serve a rural population of **0.11 million people** (552% of the need). Note that the regional proposals did not give details of costs and population to be served.

Technology mix for rural water

Dire Dawa rural

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**19,923**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD
Self supply	1	Household Dug well with Rope Pump	0	0		6	0		133	0
	2	Community Dug well with Rope Pump	0	0		42	0		32	0
On spot	3	Dug well with Hand Pump	0	0		171	0		25	0
	4	Shallow well with hand pump	25	25	100%	320	8,000	40.2%	127	1,012,864
	5	Shallow well with **solar** system (small on spot)	0	0			0			0
	6	Borehole with distribution (small on spot)	18	18	100%	2,000	36,000	180.7%	110	3,946,309
	7	Borehole with distribution (on spot) + **solar**	0	0		2,000	0		110	0
	8	Capped Spring	0	0		350	0		25	0
	9	Rain Water harvesting	0	0		737	0		29	0
	10	Cistern	0	0		57	0		90	0
	11	Hafir Dam	0	0		493	0		98	0
		Other		0			0			0
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	5	5	100%	1,400	7,000	35.1%	41	283,837
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,444	0		130	0
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0		1,444			52	0
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,200	0	0.0%	55	0
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		8,100	0		38	0
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,200	0		76	0
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		8,100	0		46	0
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	10	10	100%	3,500	35,000	175.7%	101	3,534,676
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	3	3	100%	8,000	24,000	120.5%	74	1,771,812
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			134	0
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		118	0
		Other								0
		Totals	**61**	**61**			**110,000**	**552.1%**		**10,549,497**

Annex 3: Scenario 2 - Adjusted technology mix and number of schemes

Rural water

Scenario 2 assumes that the number of rural schemes required and the technology mix proposed by the regions have been over-estimated and that the unserved populated, based on national level MoWIE data, is correct. Number of schemes and technology mix has been re-assessed through consultation with national government, DP and CSO experts and regional stakeholders to both match the needs of the unserved population and also to begin to increase resilience, sustainability and reliability.

The detail Physical and Financial plan (**Section 16**) has prepared for each region and each year of the remaining GTPII Plan based on Scenario 2.

- As described under "methodology" (**Annex 3)**, the spreadsheet tool gives the opportunity to adjust both the number of systems (down and up) as well as the technology mix, based on best available knowledge of rural water (hydrology, hydrogeology, demographics, climate, socio-economic factors, etc.), to meet 100% of the demand.
- The new technology mixes involve ones that are more expensive per capita but are considered to be more "resilient" and are less likely to fail when combined with institutional changes, capacity building and advocacy measures as proposed in this "OWNP document 2018".
- A revised technology mix and total cost is thus obtained, to which can be added factors for Program management, inflation, risk, etc.
- The spreadsheets and diagrams below represent just one possible re-adjustment scenario. This can be further refined through regional and national consultation, see Steps 14, 15, 16 on **Figure 7.1**, **Sub-section 7.3.**

A3-1 Tigray Region adjusted

- Through this method the cost is reduced, by a small amount, to **USD 63 million** and the number of schemes is reduced to 34%, with an initial (pilot) shift towards solar power.

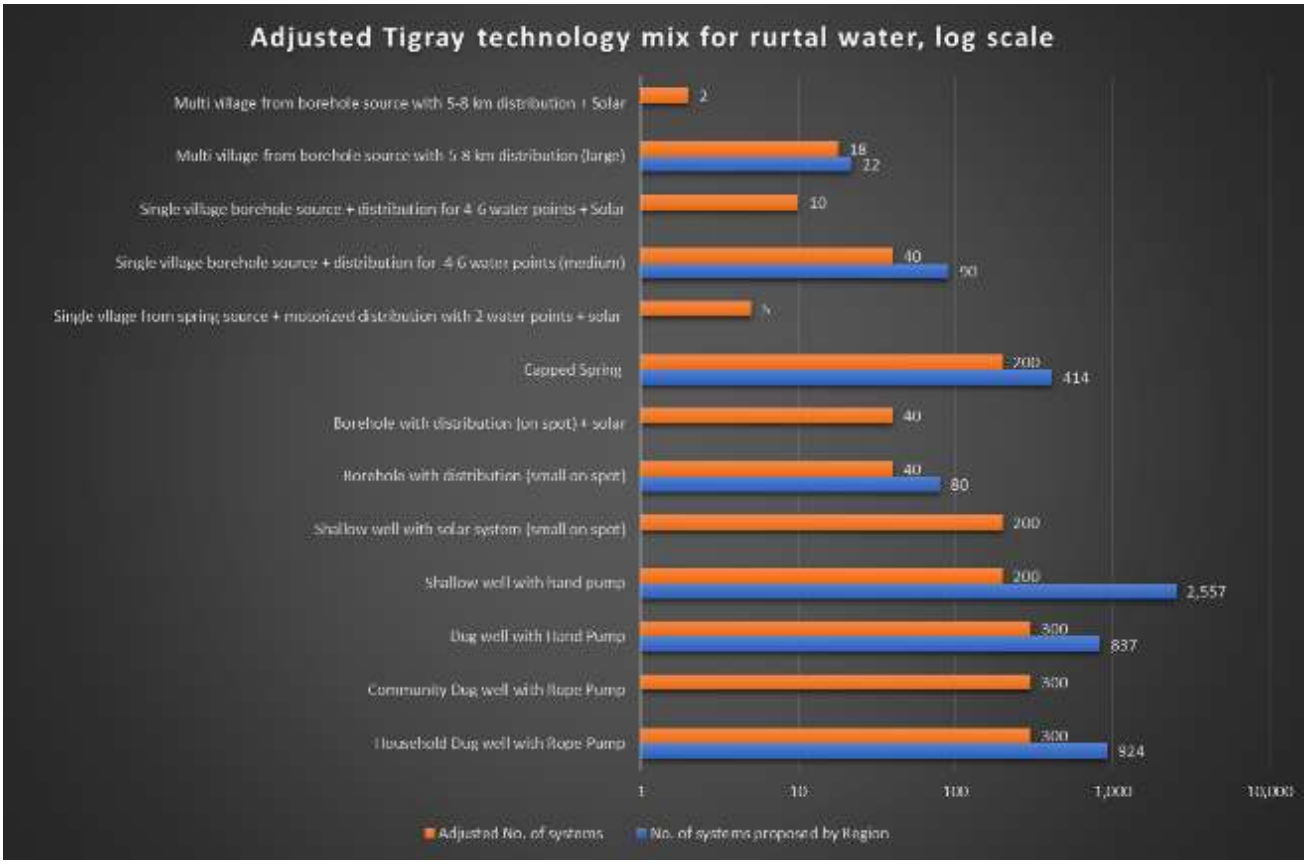
Technology mix for rural water

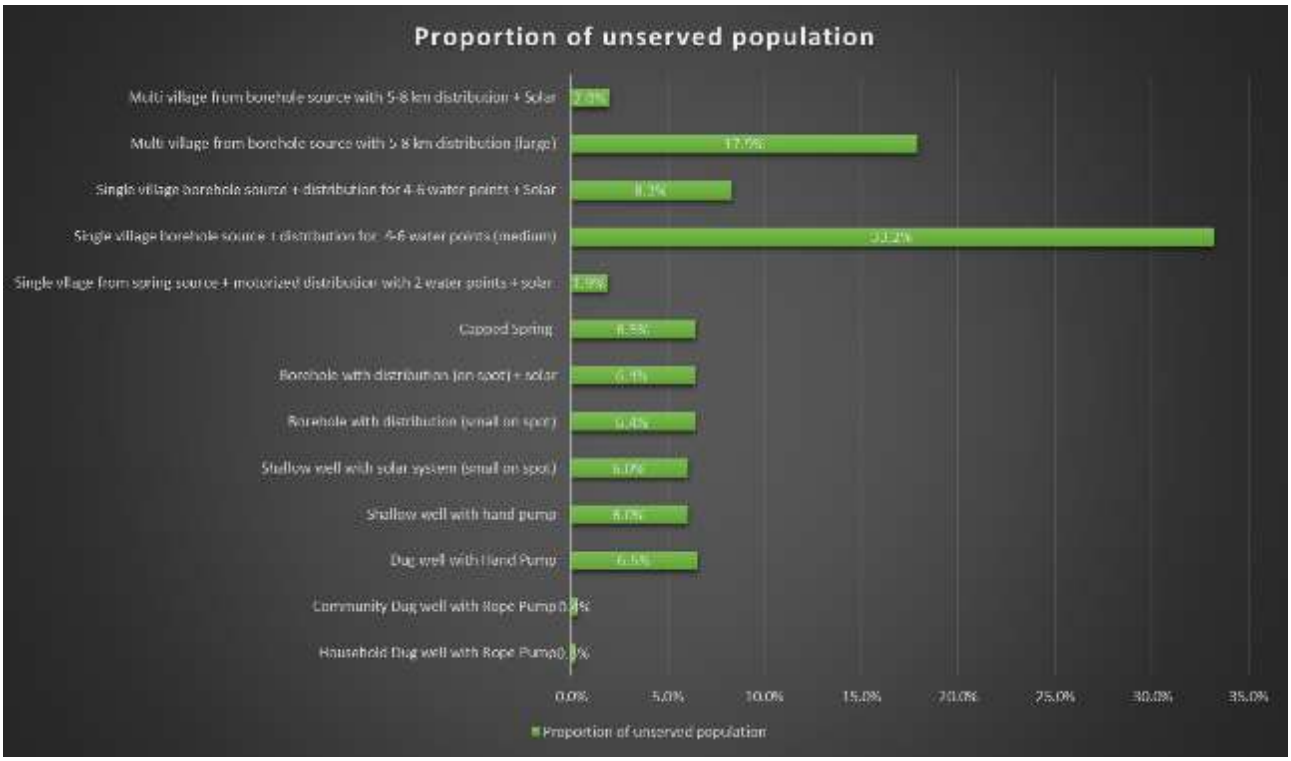
Tigray region -ADJUSTED

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	783,642

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	924	300	32%	7	2,100	0.3%	112	234,899	
	2	Community Dug well with Rope Pump	0	300		10	3,000	0.4%	78	234,899	
On spot	3	Dug well with Hand Pump	837	300	36%	171	51,300	6.5%	27	1,372,287	
	4	Shallow well with hand pump	2,557	200	8%	237	47,300	6.0%	44	2,099,717	
	5	Shallow well with **solar** system (small on spot)	0	200		237	47,300	6.0%	44	2,099,717	
	6	Borehole with distribution (small on spot)	80	40	50%	1,250	50,000	6.4%	125	6,263,982	
	7	Borehole with distribution (on spot) + **solar**	0	40		1,250	50,000	6.4%	125	6,263,982	
	8	Capped Spring	414	200	48%	253	50,600	6.5%	21	1,049,229	
	9	Rain Water harvesting	0	0		300	0		45	0	
	10	Cistern	0	0		150	0		45	0	
	11	Hafir Dam	0	0			0			0	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	0	0		1,650	0	0.0%	39	0	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		10		1,450	14,500	1.9%	75	1,089,778	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		5		3,000	15,000	1.9%	52	782,998	CARE figures
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,000	0	0.0%	79	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		8,100	0		39	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		5,500	0		54	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		8,100	0		47	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0			0			0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	90	40	44%	6,500	260,000	33.2%	88	22,968,619	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		10	11%	6,500	65,000	8.3%	88	5,742,155	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	22	18	82%	7,799	140,376	17.9%	84	11,855,938	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		2	9%	7,799	15,597	2.0%	84	1,317,326	
	15c	Large multi village from one or more very deep boreholes with long km distribution		0	0%	10,000	0		140	0	figures from Coffey? *Check CR WASH sheets*
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0	
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		115	0	
		Other								0	
		Totals	**4,924**	**1,665**			**812,073**	**103.6%**		**63,375,528**	

Adjust figures in col 4 based on best estimate to reach 100% in col 8





A3-2 Gambella Region adjusted

- Through this method the cost is reduced to **USD 3.3 million** (around one third of the original regional proposal), the number of schemes are reduced to 23%, but with a shift towards solar power.

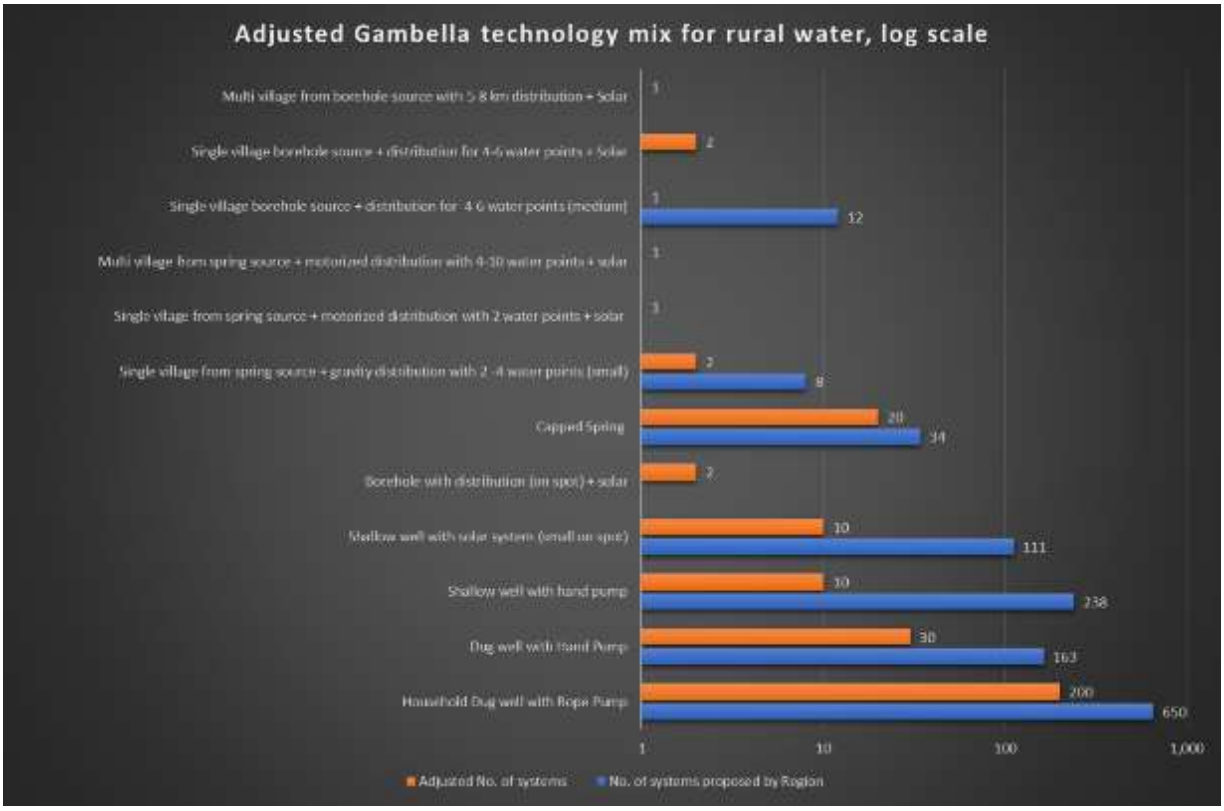
Technology mix for rural water

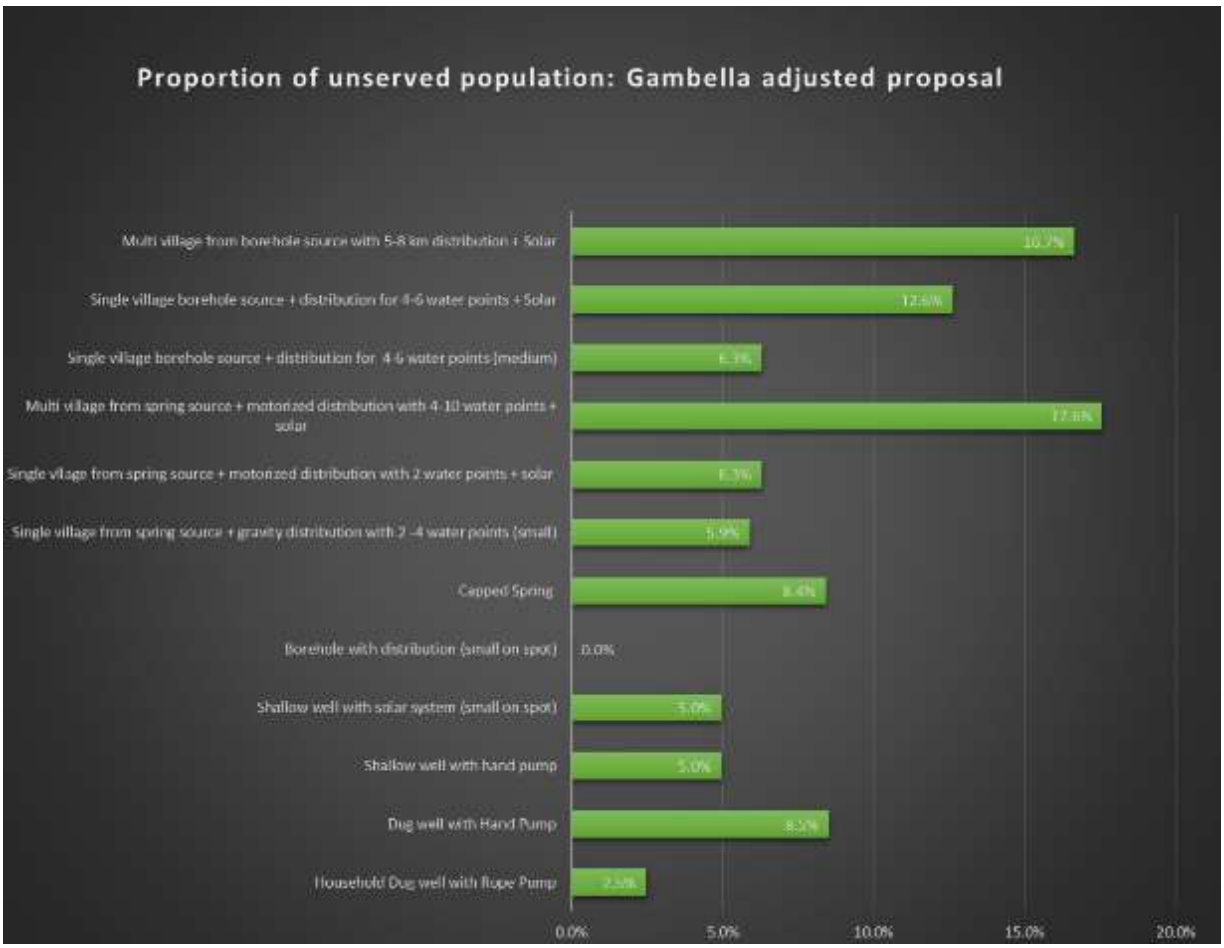
Gambella region - ADJUSTED

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY: **47,530**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	650	200	31%	6	1,180	2.5%	133	156,923	
	2	Community Dug well with Rope Pump	0	0		19	0	0.0%	47	0	
On spot	3	Dug well with Hand Pump	163	30	18%	135	4,050	8.5%	34	138,839	
	4	Shallow well with hand pump	238	10	4%	237	2,365	5.0%	95	223,643	
	5	Shallow well with **solar** system (small on spot)	111	10	9%	237	2,365	5.0%	95	223,643	
	6	Borehole with distribution (small on spot)	0	0		1,250	0	0.0%	135	0	av unit cost used
	7	Borehole with distribution (on spot) + **solar**	0	2		1,250	2,500	5.3%	135	336,596	
	8	Capped Spring	34	20	59%	200	4,007	8.4%	30	121,444	
	9	Rain Water harvesting	0	0		249	0		40	0	
	10	Cistern	0	0		127	0		140	0	
	11	Hafir Dam	0	0		2,225	0		13	0	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	8	2	25%	1,400	2,800	5.9%	96	268,227	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,300	0		117	0	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		1		3,000	3,000	6.3%	52	156,600	from Tigray
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,300	0	0.0%	49	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		9,228	0		108	0	av figures used
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,300	0		69	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		8,350	0		41	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		1		8,350	8,350	17.6%	52	435,869	from 12c
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	12	1		3,000	3,000	6.3%	105	315,245	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		2		3,000	6,000	12.6%	105	630,489	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	0	0		7,921	0	0.0%	39	0	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		1		7,921	7,921	16.7%	39	311,492	
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000	0		140	0	figures from Coffey? *Check CR WASH sheets*
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0	
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		115	0	
		Other								0	
		Totals	**1,216**	**280**			**47,538**	**100.0%**		**3,319,009**	

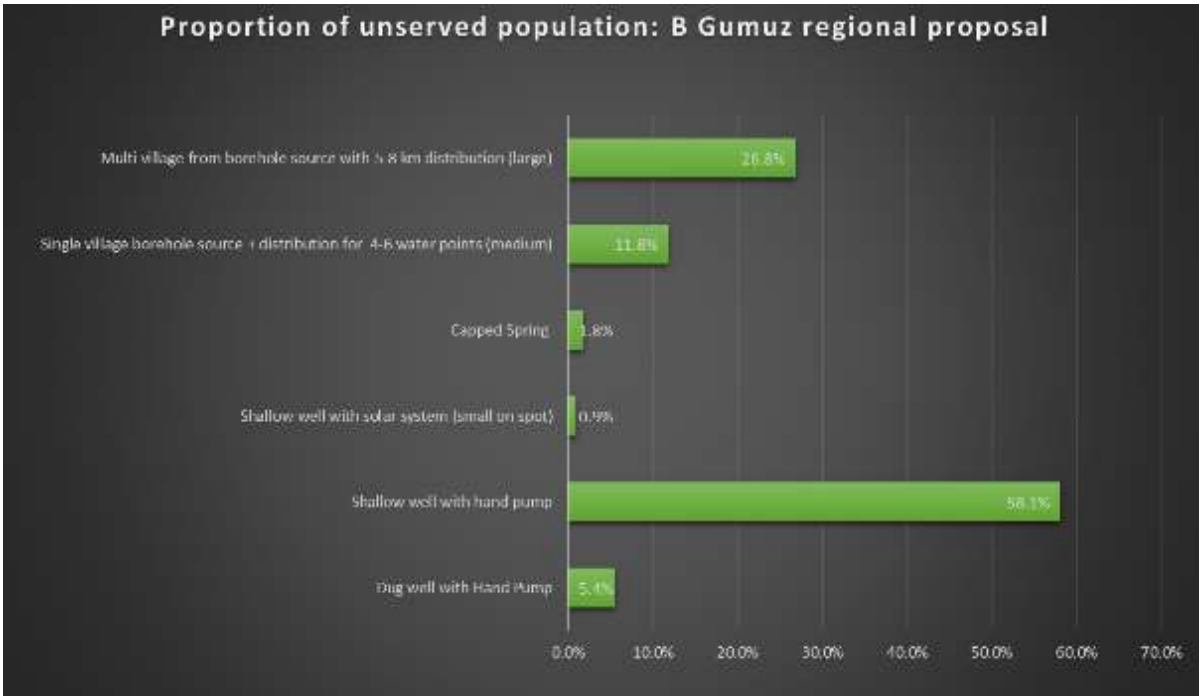
Adjust figures in col 4 based on best estimate to reach 100% in col 8

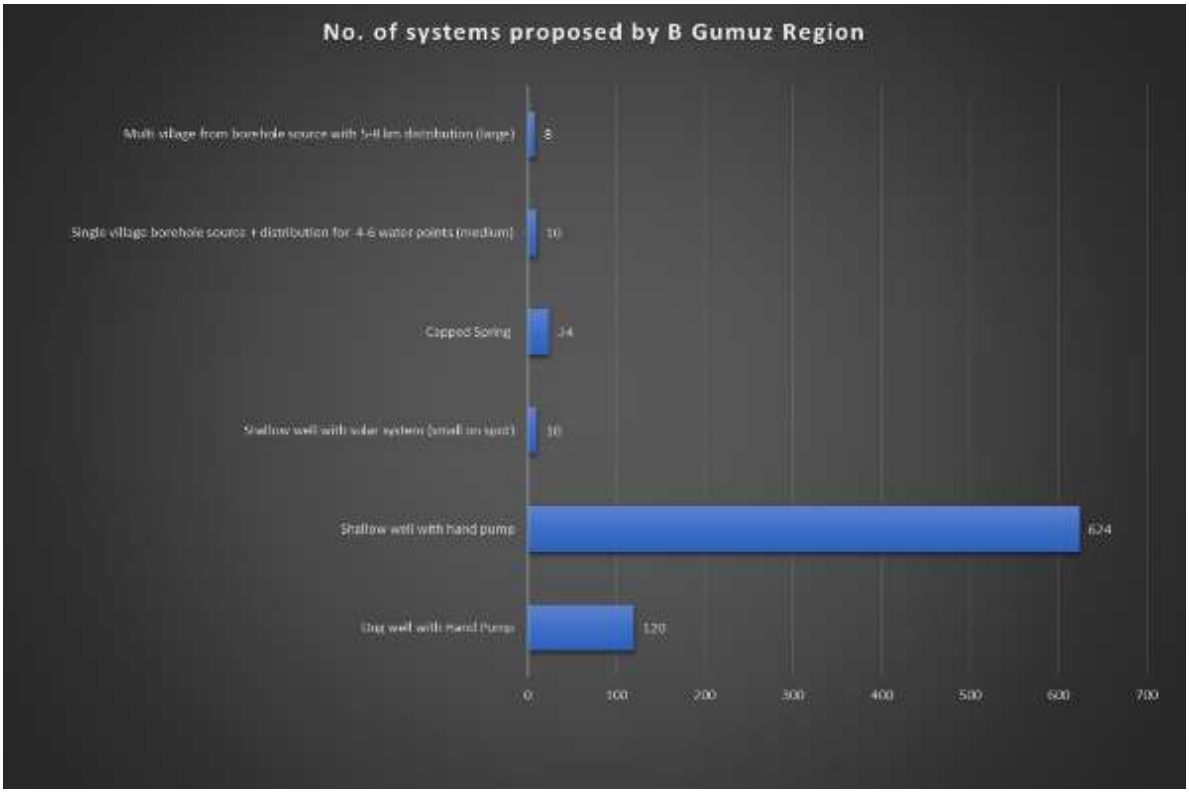




A3- 3 B. Gumuz Region adjusted

- In this particular case the regional proposal matches well with the population to be served. Also, the technology mix appears to be reasonable, so no adjustments are made.





A3-4 Harari Region adjusted

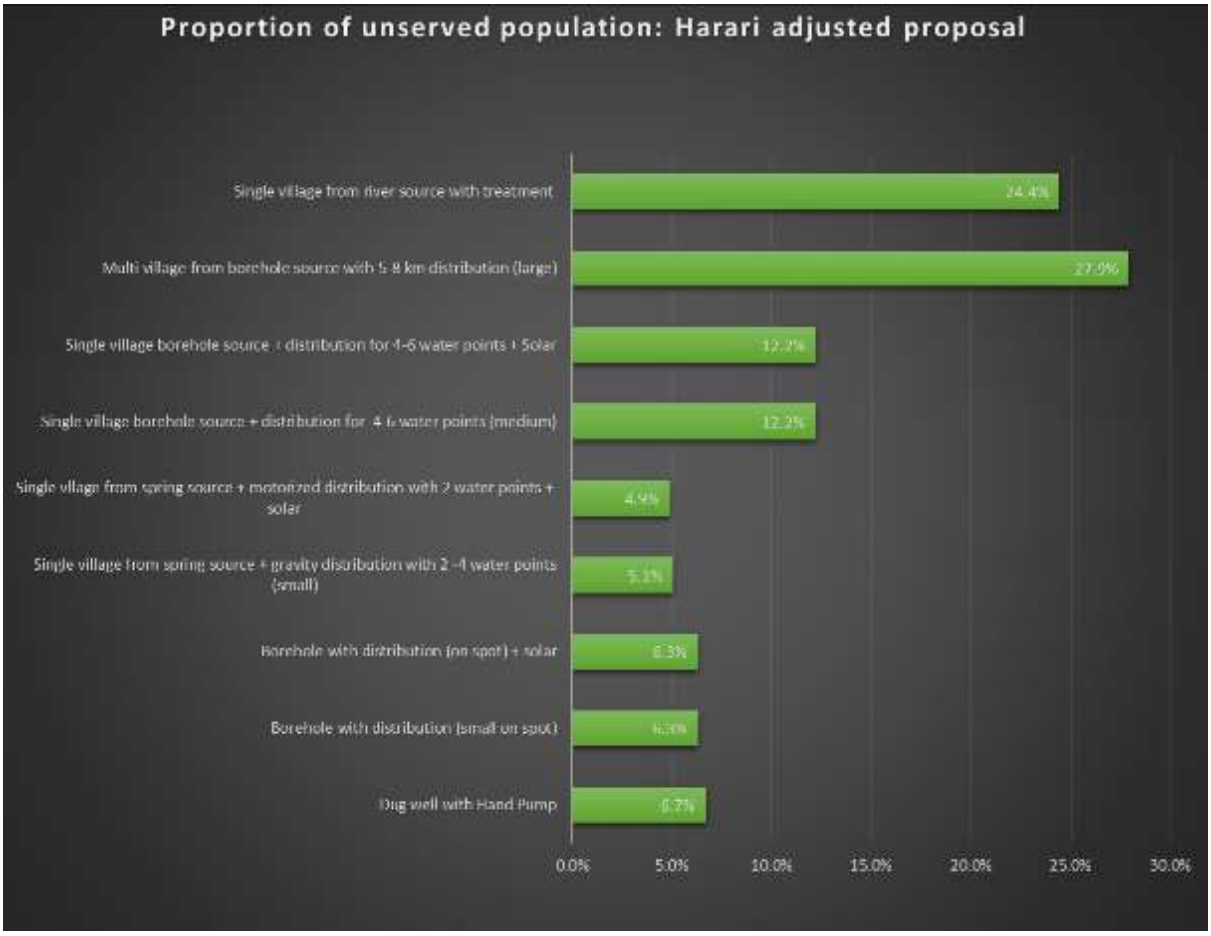
- Through this method the cost is reduced to **USD 2.7 million** (well under half of the original regional proposal), the number of schemes are reduced by half, with a shift towards solar power.

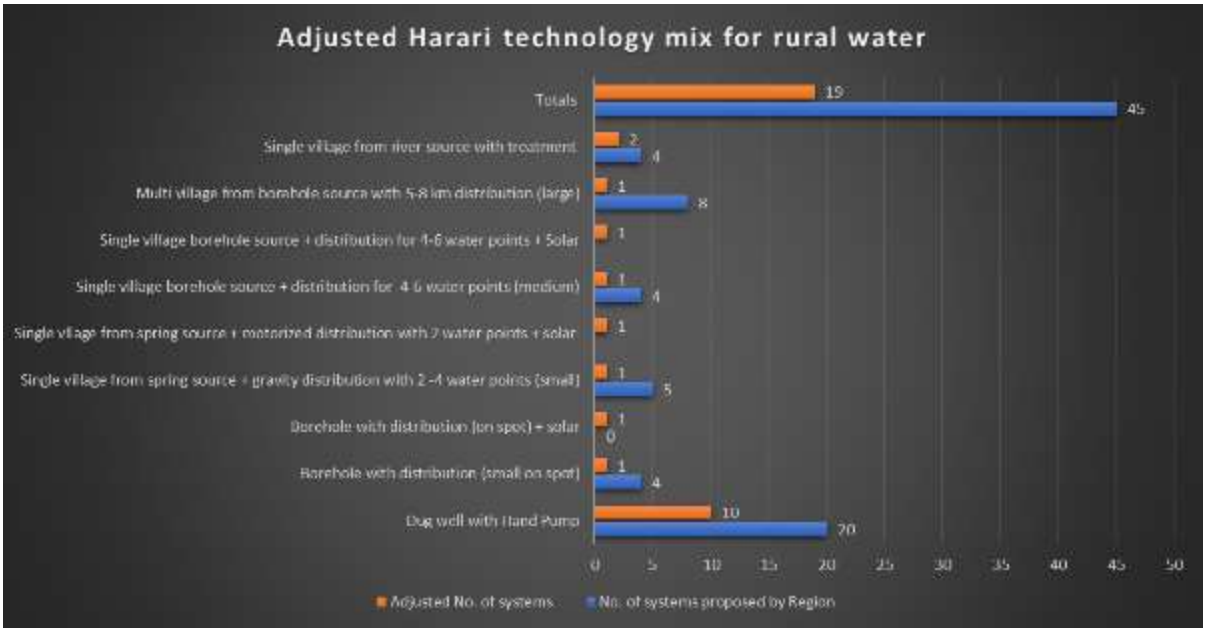
Technology mix for rural water

Harari region - ADJUSTED

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	28,645

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	0	0		6	0		133	0	
	2	Community Dug well with Rope Pump	0	0		38	0		32	0	
On spot	3	Dug well with Hand Pump	20	10	50%	193	1,925	6.7%	19	36,047	
	4	Shallow well with hand pump	0	0		280	0		71	0	
	5	Shallow well with **solar** system (small on spot)	0	0			0			0	
	6	Borehole with distribution (small on spot)	4	1	25%	1,800	1,800	6.3%	117	210,291	
	7	Borehole with distribution (on spot) + **solar**	0	1	25%	1,800	1,800	6.3%	117	210,291	
	8	Capped Spring	0	0		263	0		27	0	
	9	Rain Water harvesting	0	0		50	0		32	0	
	10	Cistern	0	0		50	0		89	0	
	11	Hafir Dam	0	0		250	0		89	0	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	5	1	20%	1,450	1,450	5.1%	68	98,088	
	12b	Single vlage from spring source + motorized distribution with 2 water points (small)		0		1,400	0		109	0	
	12c	Single vlage from spring source + motorized distribution with 2 water points + **solar**		1	20%	1,400	1,400	4.9%	52	73,080	rate from Tigray
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,200	0		52	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		8,100	0		35	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,200	0		73	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		8,100	0		44	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	4	1	25%	3,500	3,500	12.2%	97	340,045	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		1	25%	3,500	3,500	12.2%	97	340,045	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	8	1	13%	8,000	8,000	27.9%	73	583,893	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0	
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			134	0	
16. Single Village - river	16	Single village from river source with treatment	4	2	50%	3,500	7,000	24.4%	115	805,788	
17. Multi Village -	17	Multi village from river source with treatment	0	0		0	0		115	0	
		Other								0	
		Totals	45	19			30,375	106.0%		2,697,566	





A3-5 Somali Region adjusted

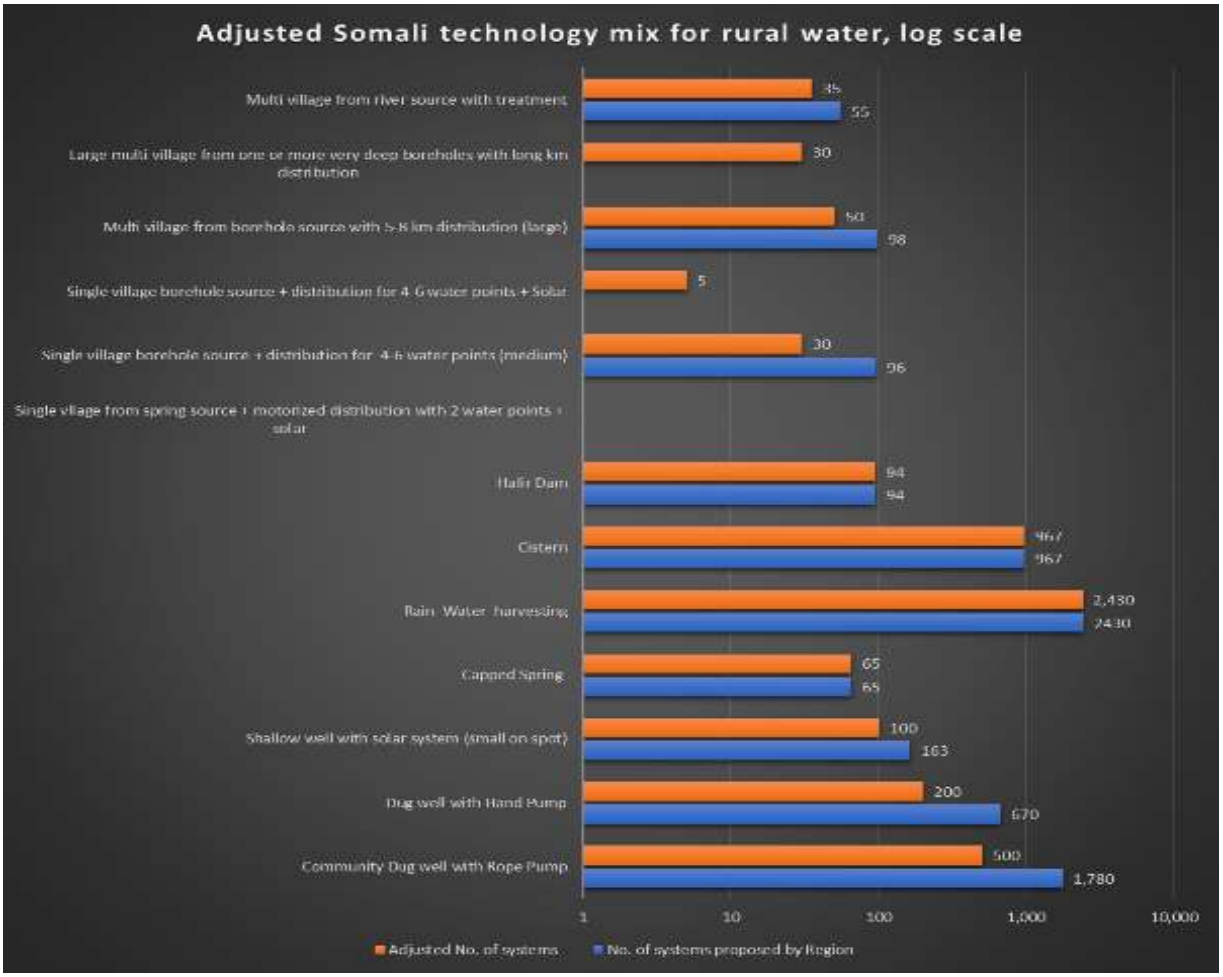
- Through this method the cost is reduced to **USD 159 million** (under half of the original regional proposal)

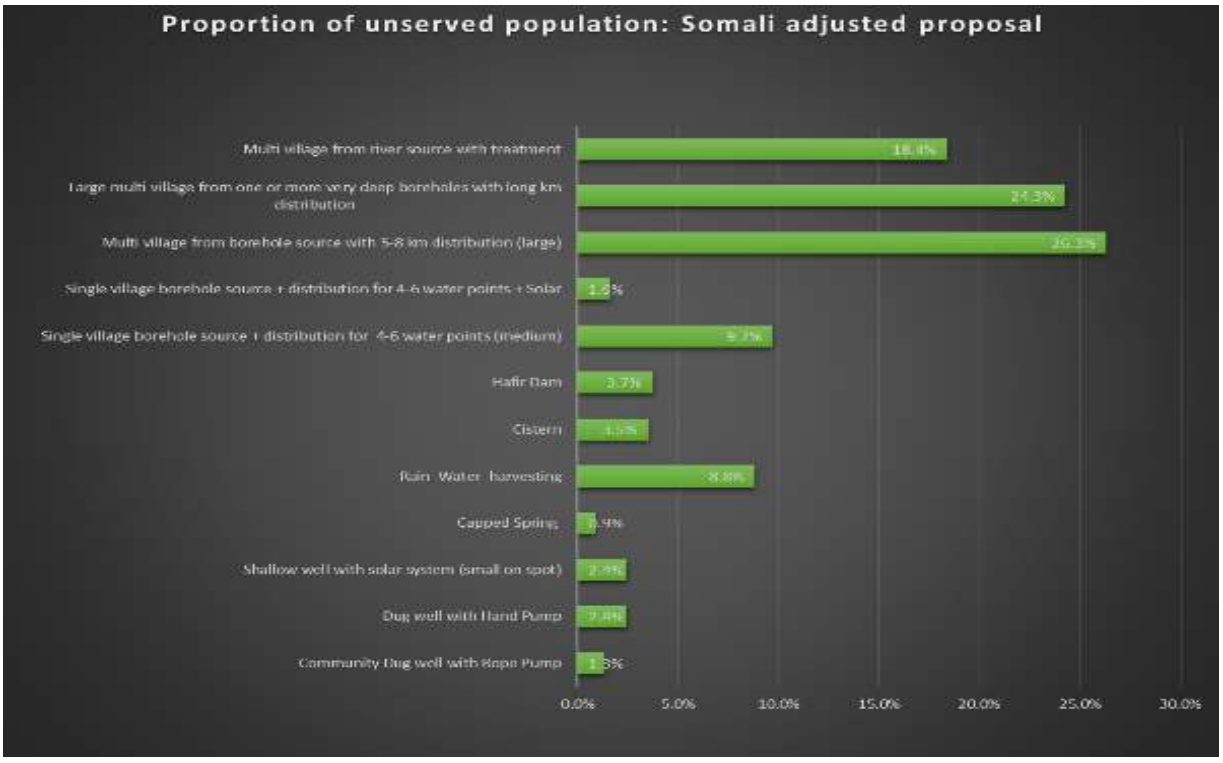
Technology mix for rural water

Somali region -ADJUSTED

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**1,236,365**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	0	0		3	0		224	0	
	2	Community Dug well with Rope Pump	1,780	500	28%	33	16,500	1.3%	44	722,000	
On spot	3	Dug well with Hand Pump	670	200	30%	150	30,000	2.4%	20	596,570	
	4	Shallow well with hand pump	0	0		300	0		89	0	
	5	Shallow well with **solar** system (small on spot)	163	100	61%	300	30,000	2.4%	89	2,684,564	
	6	Borehole with distribution (small on spot)	0	0		1,800	0		211	0	
	7	Borehole with distribution (on spot) + **solar**	0	0		1,800	0			0	
	8	Capped Spring	65	65	100%	175	11,375	0.9%	43	494,407	
	9	Rain Water harvesting	2430	2,430	100%	45	109,350	8.8%	40	4,348,993	
	10	Cistern	967	967	100%	45	43,515	3.5%	118	5,120,265	
	11	Hafir Dam	94	94	100%	493	46,300	3.7%	98	4,558,347	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	0	0		1,500	0		104	0	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,000	0		268	0	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0						0	
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		2,200	0		173	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		4,500	0		114	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		2,200	0		203	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		4,500	0		129	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	96	30	31%	4,000	120,000	9.7%	164	19,731,544	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		5	5%	4,000	20,000	1.6%	164	3,288,591	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	98	50	51%	6,500	325,000	26.3%	148	48,098,434	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0	
	15c	Large multi village from one or more very deep boreholes with long km distribution		30	31%	10,000	300,000	24.3%	145	43,500,000	
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0	
17. Multi Village -	17	Multi village from river source with treatment	55	35	64%	6,500	227,500	18.4%	115	26,188,108	
		Other								0	
		Totals	**6,418**	**4,506**			**1,279,540**	**103.5%**		**159,331,822**	

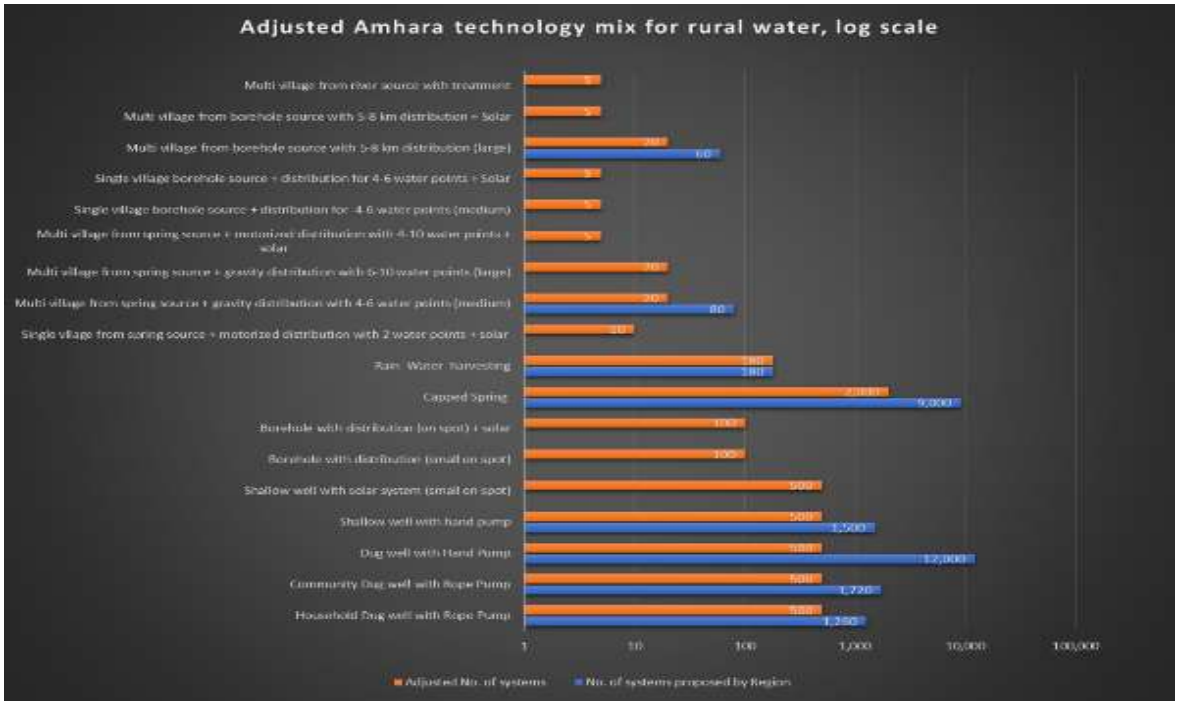


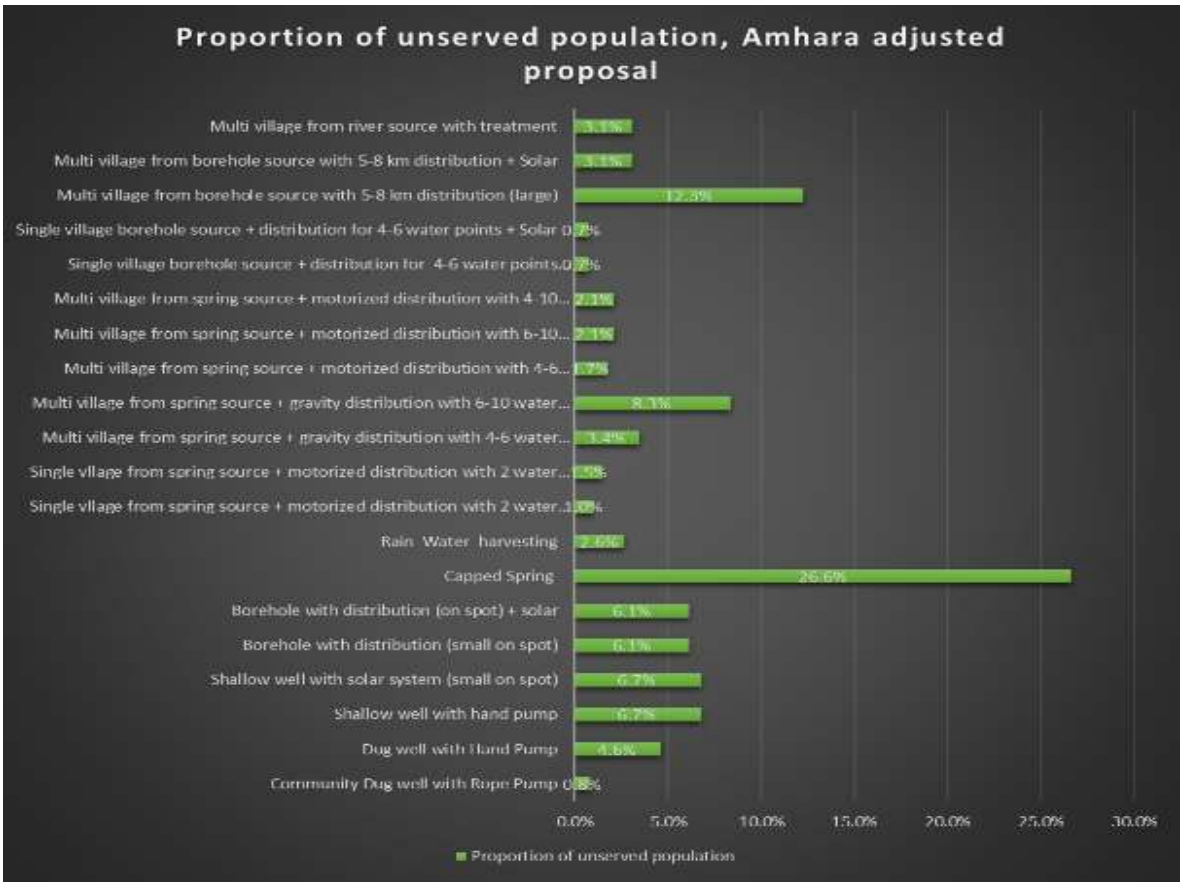


A3-6 Amhara Region adjusted

- Through this method the cost is reduced to **USD 107 million** (well under half of the original regional proposal), the number of schemes are reduced to 20%, but including some much larger projects, with a shift towards deeper boreholes, surface water and solar power.

		Technology mix for rural water									
		Amhara region - ADJUSTED									
		Unserved population to be served in the remaining three years	2,038,169								
Type		**Technology**	**No. of systems proposed by Region**	**Adjusted No. of systems**	**Adjust-ment %age**	**Av. population served per system in this region**	**Adjusted regional population to be served by this system**	**Proportion of unserved population**	**Unit cost per capita USD**	**Total cost USD**	**Notes**
Self supply	1	Household Dug well with Rope Pump	1,260	500	40%	6	2,750	0.1%	164	451,156	
	2	Community Dug well with Rope Pump	1,720	500	29%	32	16,000	0.8%	37	594,360	
On spot	3	Dug well with Hand Pump	12,000	500	4%	188	93,900	4.6%	26	2,453,493	
	4	Shallow well with hand pump	1,500	500	33%	274	137,138	6.7%	45	6,223,221	
	5	Shallow well with **solar** system (small on spot)	0	500		274	137,138	6.7%	45	6,223,221	
	6	Borehole with distribution (small on spot)	0	100		1250	125,000	6.1%	125	15,659,955	
	7	Borehole with distribution (on spot) + **solar**	0	100		1250	125,000	6.1%	125	15,659,955	
	8	Capped Spring	9,000	2,000	22%	271	542,000	26.6%	19	10,511,106	
	9	Rain Water harvesting	180	180	100%	300	54,000	2.6%	45	2,416,107	
	10	Cistern	0	0							
	11	Hafir Dam	0	0							
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	0	0		1395	0	0.0%	34	0	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		10		2000	20,000	1.0%	58	1,158,340	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		10		3000	30,000	1.5%	52	1,560,000	From Tigray CARE
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	80	20	25%	3500	70,000	3.4%	38	2,684,564	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		20	25%	8500	170,000	8.3%	34	5,816,555	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		10	13%	3500	35,000	1.7%	58		
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		5	6%	8500	42,500	2.1%	42		
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		5	6%	8500	42,500	2.1%	52	2,210,000	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	0	5		3000	15,000	0.7%	75	1,118,568	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		5		3000	15,000	0.7%	75	1,118,568	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	60	20	33%	12500	250,000	12.3%	77	19,239,374	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		5	8%	12500	62,500	3.1%	77	4,809,843	
	15c	Large multi village from one or more very deep boreholes with long km distribution			0%	10000			127		
16. Single Village - river	16	Single village from river source with treatment	0				0				
17. Multi Village -	17	Multi village from river source with treatment	0	5		12500	62,500	3.1%	115	7,194,535	
		Other									
		Totals	**25,800**	**5,000**			**2,047,926**	**100.5%**		**107,102,923**	
				Adjust figures in col 4 based on best estimate to reach 100% in col 8							


Adjusted Amhara technology mix for rural water, log scale
Multi village from river source with treatment
Multi village from borehole source with 5-8 km distribution + Solar
Multi village from borehole source with 5-8 km distribution (large)
Single village borehole source + distribution for 4-6 water points + Solar
Single village borehole source + distribution for 4-6 water points (medium)
Multi village from spring source + motorized distribution with 4-10 water points + solar
Multi village from spring source + gravity distribution with 6-10 water points (large)
Multi village from spring source + gravity distribution with 4-6 water points (medium)
Single village from spring source + motorized distribution with 2 water points + solar
Rain Water harvesting
Capped Spring
Borehole with distribution (on spot) + solar
Borehole with distribution (small on spot)
Shallow well with solar system (small on spot)
Shallow well with hand pump
Dug well with Hand Pump
Community Dug well with Rope Pump
Household Dug well with Rope Pump
1
10
100
1,000
10,000
100,000
Adjusted No. of systems
No. of systems proposed by Region


Proportion of unserved population, Amhara adjusted proposal
Multi village from river source with treatment
Multi village from borehole source with 5-8 km distribution + Solar
Multi village from borehole source with 5-8 km distribution (large)
Single village borehole source + distribution for 4-6 water points + Solar
Single village borehole source + distribution for 4-6 water points
Multi village from spring source + motorized distribution with 4-10...
Multi village from spring source + motorized distribution with 6-10...
Multi village from spring source + motorized distribution with 4-6...
Multi village from spring source + gravity distribution with 6-10 water...
Multi village from spring source + gravity distribution with 4-6 water...
Single village from spring source + motorized distribution with 2 water...
Single village from spring source + motorized distribution with 2 water...
Rain Water harvesting
Capped Spring
Borehole with distribution (on spot) + solar
Borehole with distribution (small on spot)
Shallow well with solar system (small on spot)
Shallow well with hand pump
Dug well with Hand Pump
Community Dug well with Rope Pump
0.0%
5.0%
10.0%
15.0%
20.0%
25.0%
30.0%
Proportion of unserved population

A3-7 Afar Region adjusted

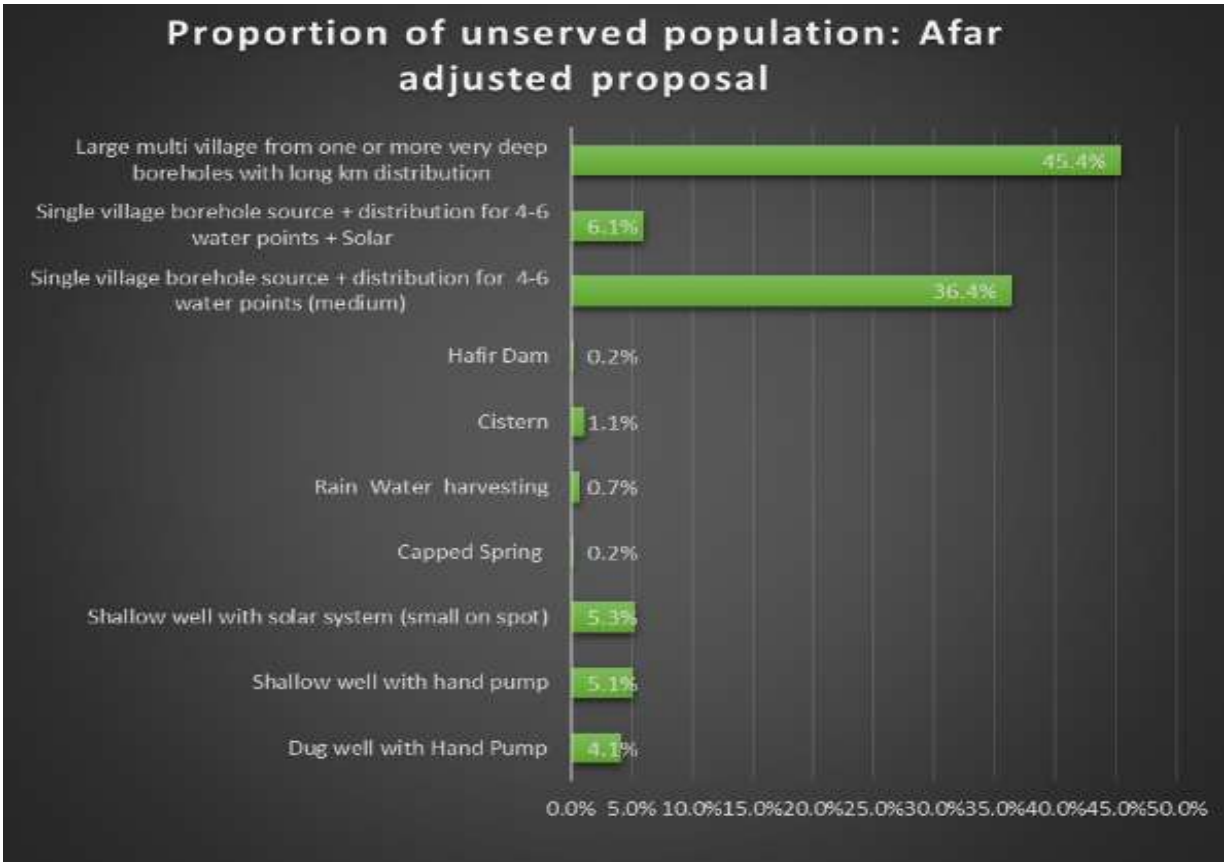
- Through this method the cost is increased to **USD 85 million** with a shift towards deeper boreholes and solar power.

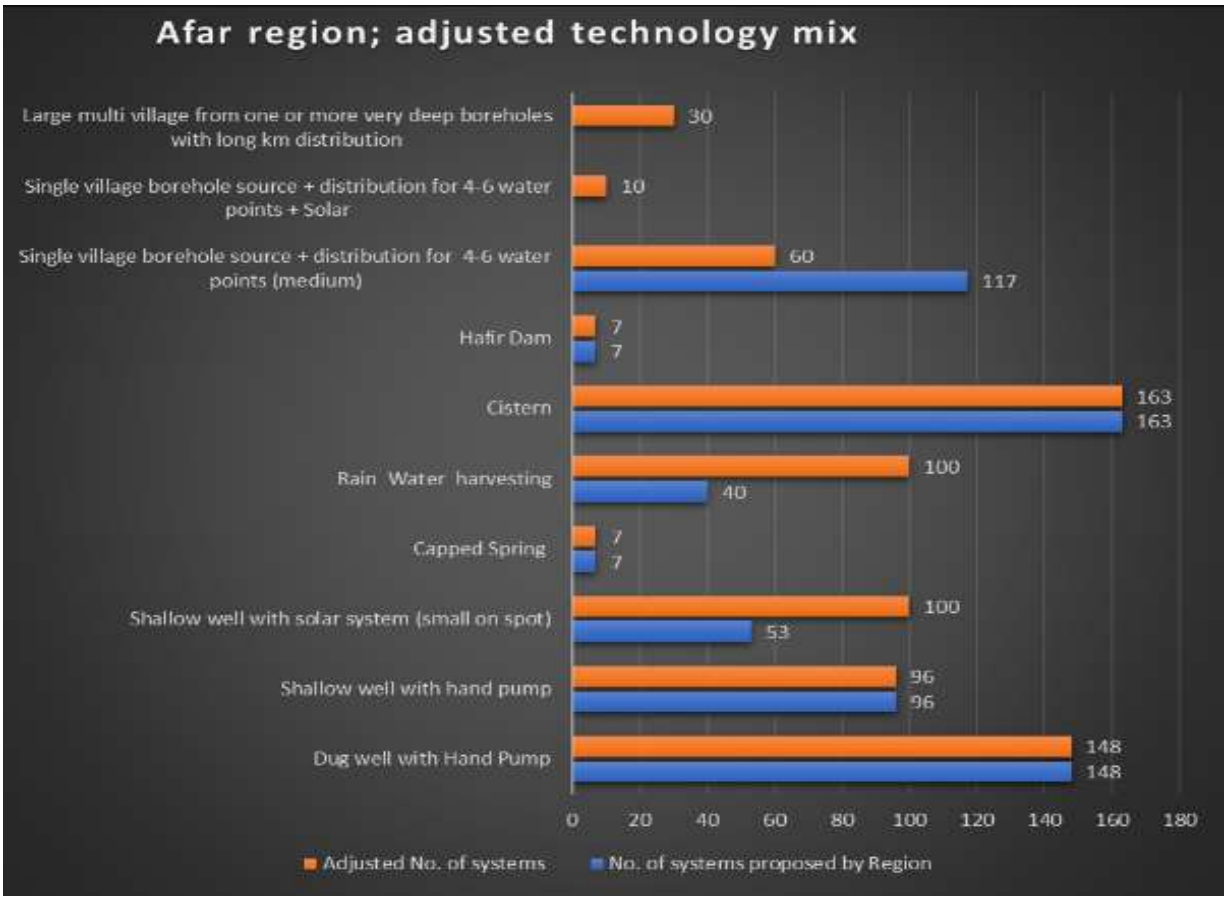
Technology mix for rural water

Afar region - ADJUSTED

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**660,222**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	0	0		6	0		133	0	
	2	Community Dug well with Rope Pump	0	0		33	0		44	0	
On spot	3	Dug well with Hand Pump	148	148	100%	185	27,380	4.1%	21	588,027	
	4	Shallow well with hand pump	96	96	100%	350	33,600	5.1%	56	1,866,618	
	5	Shallow well with **solar** system (small on spot)	53	100	189%	350	35,000	5.3%	56	1,944,394	
	6	Borehole with distribution (small on spot)	0	0		2,000	0		151	0	
	7	Borehole with distribution (on spot) + **solar**	0	0		2,000	0		151	0	
	8	Capped Spring	7	7	100%	175	1,225	0.2%	30	36,422	
	9	Rain Water harvesting	40	100	250%	44	4,400	0.7%	44	192,500	
	10	Cistern	163	163	100%	44	7,172	1.1%	120	863,085	
	11	Hafir Dam	7	7	100%	222	1,554	0.2%	119	185,339	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	0	0		1,350	0		103	0	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,200	0		186	0	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0		1,200			52	0	rate from Tigray
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,000	0		97	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		6,500	0		65	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,000	0		76	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		6,500	0		76	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	117	60		4,000	240,000	36.4%	129	30,872,483	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		10		4,000	40,000	6.1%	129	5,145,414	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	0	0		7,000	0		112	0	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0	
	15c	Large multi village from one or more very deep boreholes with long km distribution		30		10,000	300,000	45.4%	145	43,500,000	
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0	
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		115	0	
		Other								0	
		Totals	**631**	**721**			**690,331**	**104.6%**		**85,194,282**	
				Adjust figures in col 4 based on best estimate to reach 100% in col 8							

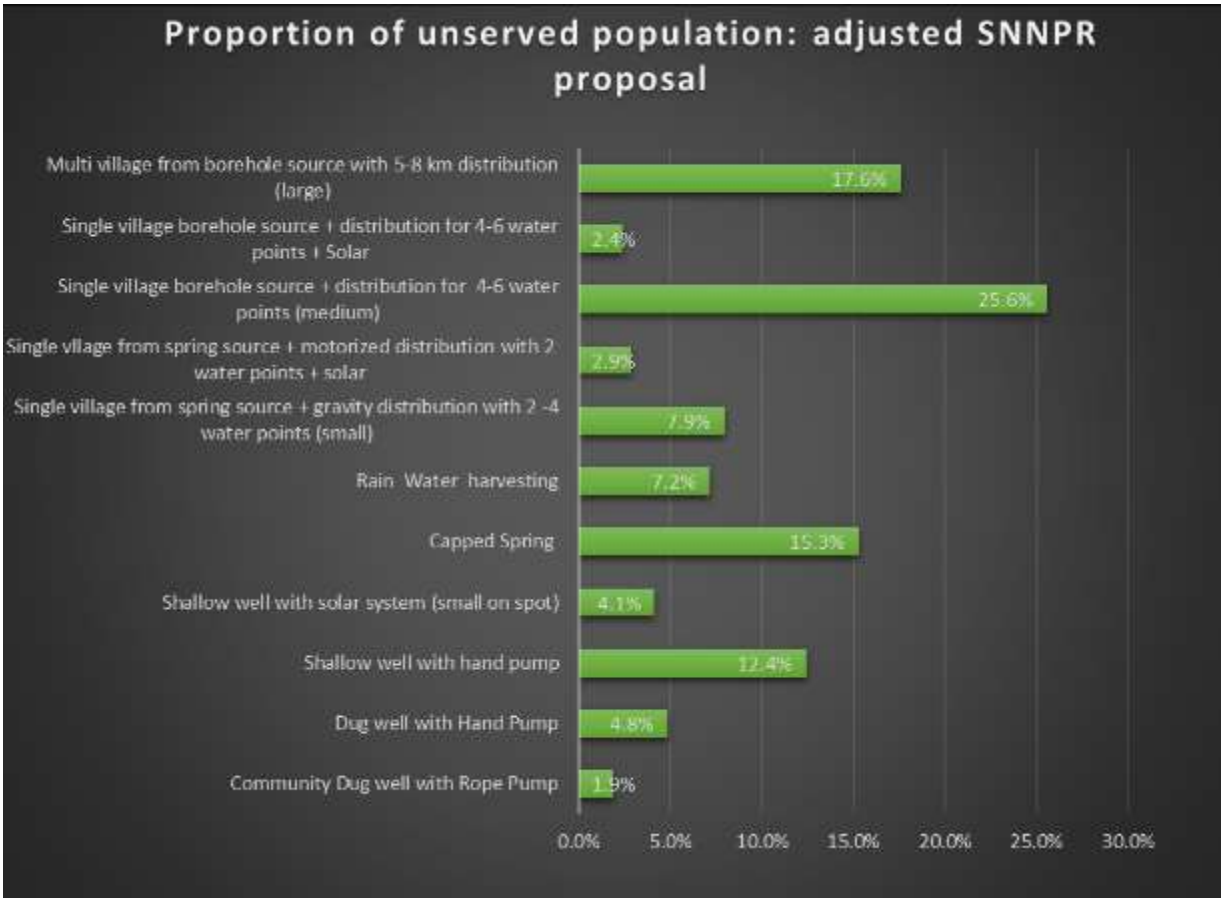


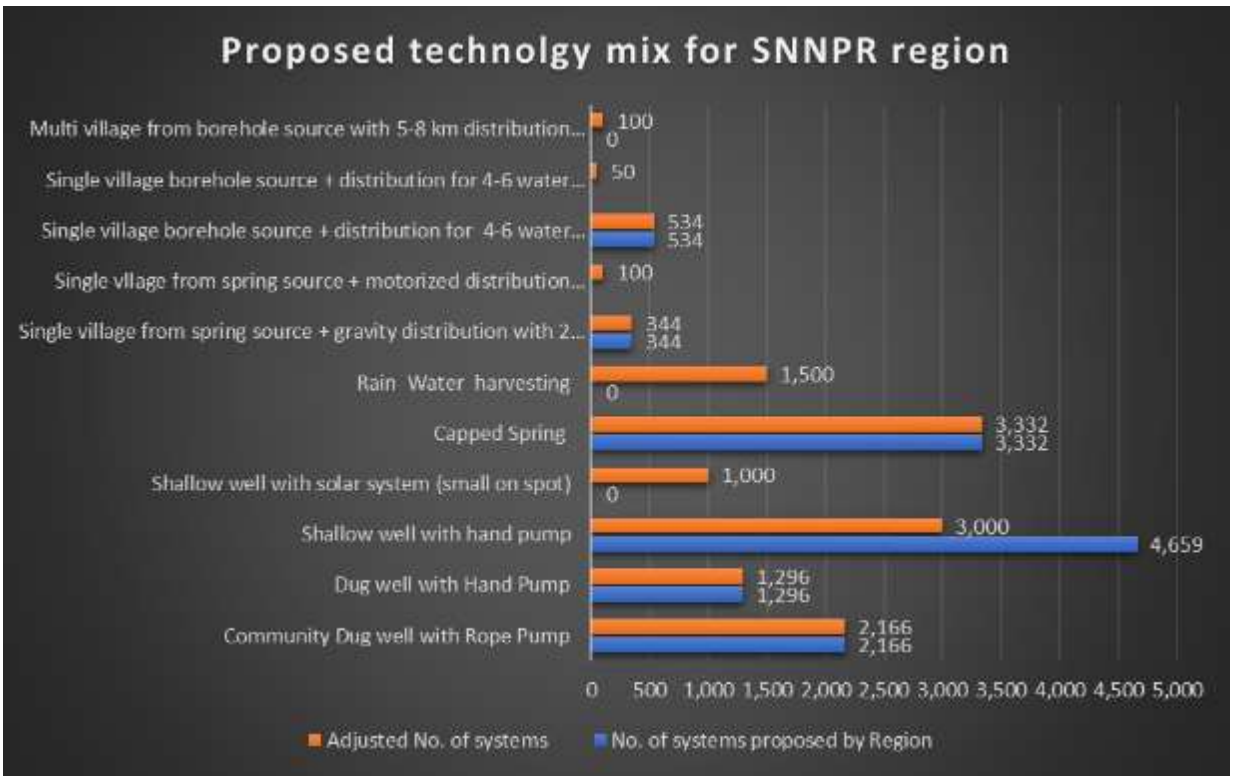


A3-8 SNNP Region adjusted

- Through this method the cost stays the same as the regional proposal at **USD 367 million** with a shift towards deeper boreholes and solar power.

		SNNPR region - ADJUSTED									
		Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY				6,266,079					
Type		**Technology**	**No. of systems proposed by Region**	**Adjusted No. of systems**	**Adjust-ment %age**	**Av. population served per system in this region**	**Adjusted regional population to be served by this system**	**Proportion of unserved population**	**Unit cost per capita USD**	**Total cost USD**	**Notes**
Self supply	1	Household Dug well with Rope Pump	0	0		7	0	0.0%	112	0	
	2	Community Dug well with Rope Pump	2,166	2,166	100%	54	116,964	1.9%	21	2,501,730	
On spot	3	Dug well with Hand Pump	1,296	1,296	100%	234	303,005	4.8%	25	7,709,732	
	4	Shallow well with hand pump	4,659	3,000	64%	260	779,328	12.4%	47	36,297,796	
	5	Shallow well with **solar** system (small on spot)	0	1,000		260	259,776	4.1%	47	12,099,265	
	6	Borehole with distribution (small on spot)	0	0		1,500	0		140	0	
	7	Borehole with distribution (on spot) + **solar**	0	0		1,500	0		140	0	
	8	Capped Spring	3,332	3,332	100%	287	955,729	15.3%	19	17,762,375	
	9	Rain Water harvesting	0	1,500		300	450,000	7.2%	45	20,134,228	
	10	Cistern	0	0		72	0		59	0	
	11	Hafir Dam	0	0			0			0	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	344	344	100%	1,445	497,208	7.9%	35	17,622,186	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,800	0		92	0	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		100		1,800	180,000	2.9%	52	9,395,973	rate from Tigray
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,800	0		51	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		10,200	0		32	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,800	0		68	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		10,200	0		38	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	534	534	100%	3,000	1,602,000	25.6%	107	172,026,846	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		50		3,000	150,000	2.4%	107	16,107,383	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	0	100		11,000	1,100,000	17.6%	51	55,928,412	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0	
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			127	0	
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0	
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		115	0	
		Other								0	
		Totals	**12,331**	**13,422**			**6,394,009**	**102.0%**		**367,585,925**	
				Adjust figures in col 4 based on best estimate to reach 100% in col 8							





A3-9 Oromiya Region adjusted

- Through this method the cost is increased to **USD 546 million** the number of schemes is nearly doubled and includes some larger projects, with a shift towards deeper boreholes, surface water and solar power.

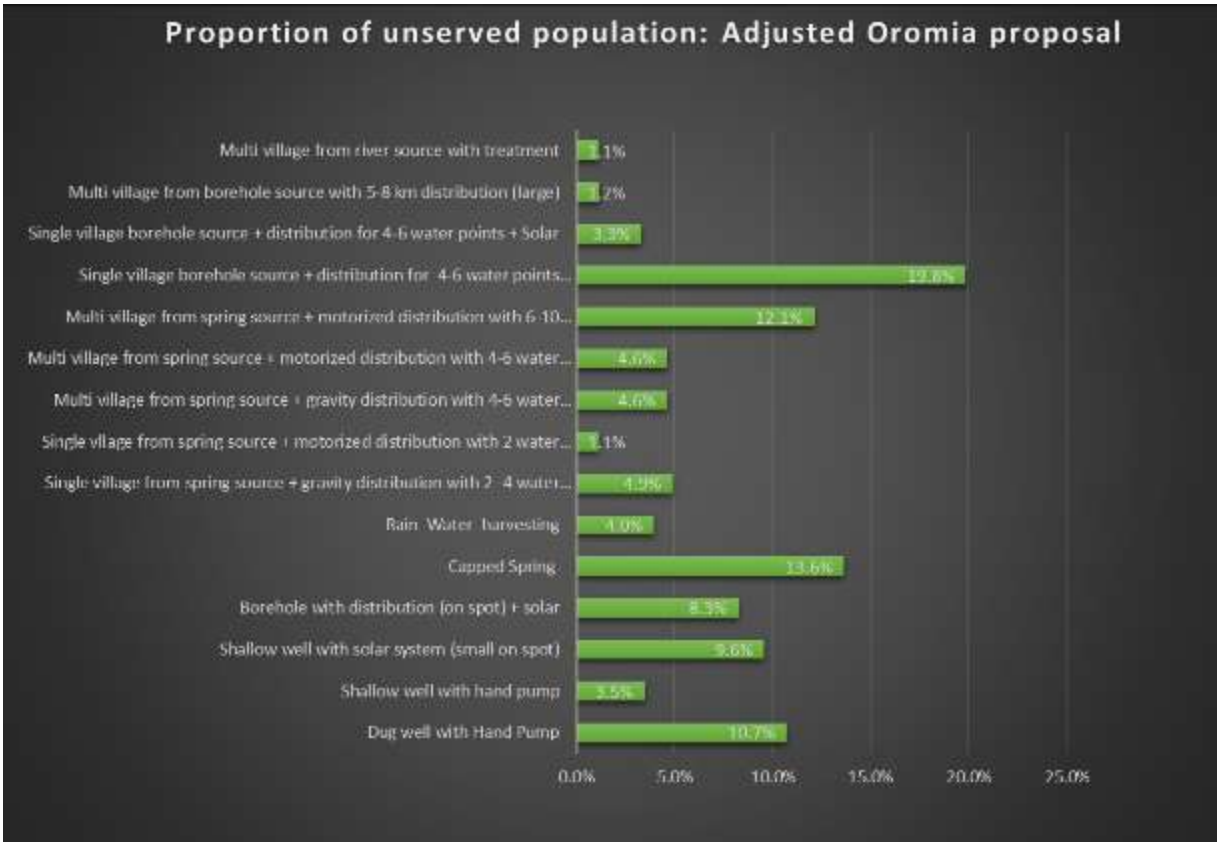
Technology mix for rural water

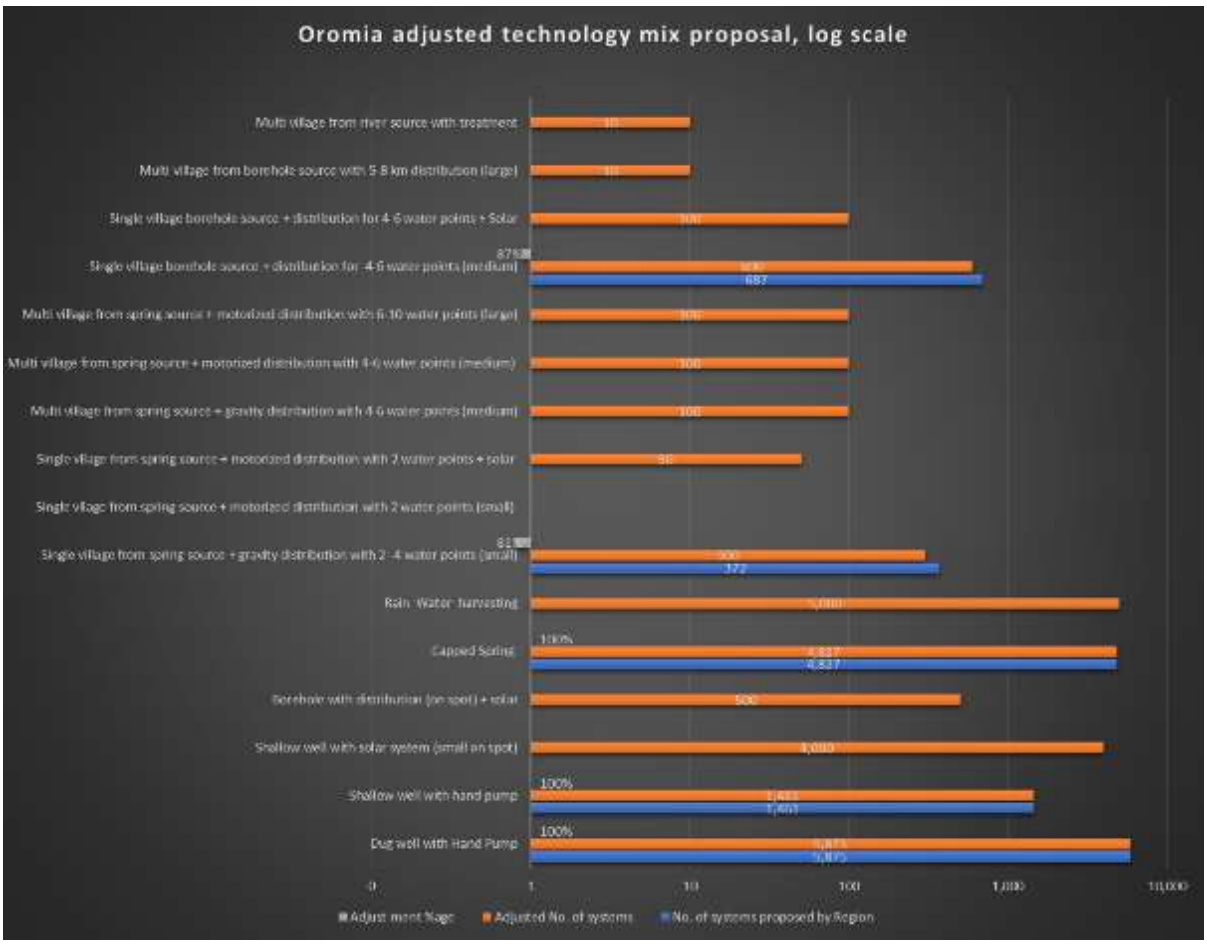
Oromia region - ADJUSTED

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**9,076,728**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	0	0		7	0		112	0	
	2	Community Dug well with Rope Pump	0	0		54	0		21	0	
On spot	3	Dug well with Hand Pump	5,875	5,875	100%	166	972,900	10.7%	23	22,372,502	
	4	Shallow well with hand pump	1,461	1,461	100%	217	316,953	3.5%	41	13,034,585	
	5	Shallow well with **solar** system (small on spot)	0	4,000		217	867,770	9.6%	41	35,686,749	
	6	Borehole with distribution (small on spot)	0	0		1,500	0		134	0	
	7	Borehole with distribution (on spot) + **solar**	0	500		1,500	750,000	8.3%	134	100,671,141	
	8	Capped Spring	4,827	4,827	100%	256	1,236,402	13.6%	20	24,881,648	
	9	Rain Water harvesting	0	5,000		72	360,000	4.0%	21	7,700,000	
	10	Cistern	0	0		72	0		90	0	
	11	Hafir Dam	0	0		359	0		59	0	
		Other	0	0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	372	300	81%	1,479	443,612	4.9%	35	15,469,239	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		2,000	0		81	0	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		50		2,000	100,000	1.1%	52	5,219,985	Unit rate from Tigray
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	100		4,200	420,000	4.6%	44	18,344,519	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		11,000	0		31	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		100		4,200	420,000	4.6%	60	25,055,928	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		100		11,000	1,100,000	12.1%	35	38,926,174	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	687	600	87%	3,000	1,800,000	19.8%	104	187,919,463	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		100		3,000	300,000	3.3%	104	31,319,911	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	0	10		10,500	105,000	1.2%	52	5,467,562	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0	
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			127	0	
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0	
17. Multi Village -	17	Multi village from river source with treatment	0	10		10,000	100,000	1.1%	115	11,511,256	
		Other								0	
		Totals	**13,222**	**23,033**			**9,292,637**	**102.4%**		**543,580,664**	

Adjust figures in col 4 based on best estimate to reach 100% in col 8


Proportion of unserved population: Adjusted Oromia proposal
Multi village from river source with treatment
Multi village from borehole source with 5-8 km distribution (large)
Single village borehole source + distribution for 4-6 water points + Solar
Single village borehole source + distribution for 4-6 water points...
Multi village from spring source + motorized distribution with 6-10...
Multi village from spring source + motorized distribution with 4-6 water...
Multi village from spring source + gravity distribution with 4-6 water...
Single village from spring source + motorized distribution with 2 water...
Single village from spring source + gravity distribution with 2 -4 water...
Rain Water harvesting
Capped Spring
Borehole with distribution (on spot) + solar
Shallow well with solar system (small on spot)
Shallow well with hand pump
Dug well with Hand Pump
1.1%
1.2%
3.3%
12.6%
12.1%
4.6%
4.6%
1.1%
4.3%
4.0%
13.6%
8.3%
9.6%
5.5%
10.7%
0.0%
5.0%
10.0%
15.0%
20.0%
25.0%


Oromia adjusted technology mix proposal, log scale
Multi village from river source with treatment
Multi village from borehole source with 5-8 km distribution (large)
Single village borehole source + distribution for 4-6 water points + Solar
Single village borehole source + distribution for 4-6 water points (medium)
Multi village from spring source + motorized distribution with 6-10 water points (large)
Multi village from spring source + motorized distribution with 4-6 water points (medium)
Multi village from spring source + gravity distribution with 4-6 water points (medium)
Single village from spring source + motorized distribution with 2 water points + solar
Single village from spring source + motorized distribution with 2 water points (small)
Single village from spring source + gravity distribution with 2 -4 water points (small)
Rain Water harvesting
Capped Spring
Borehole with distribution (on spot) + solar
Shallow well with solar system (small on spot)
Shallow well with hand pump
Dug well with Hand Pump
100%
100%
100%
0
1
10
100
1,000
10,000
Adjustment %age
Adjusted No. of systems
No. of systems proposed by Region

A3-10 Dire Dawa Region adjusted

- Through this method the cost is reduced to **USD 1.7 million**, the number of schemes is reduced to one fifth.

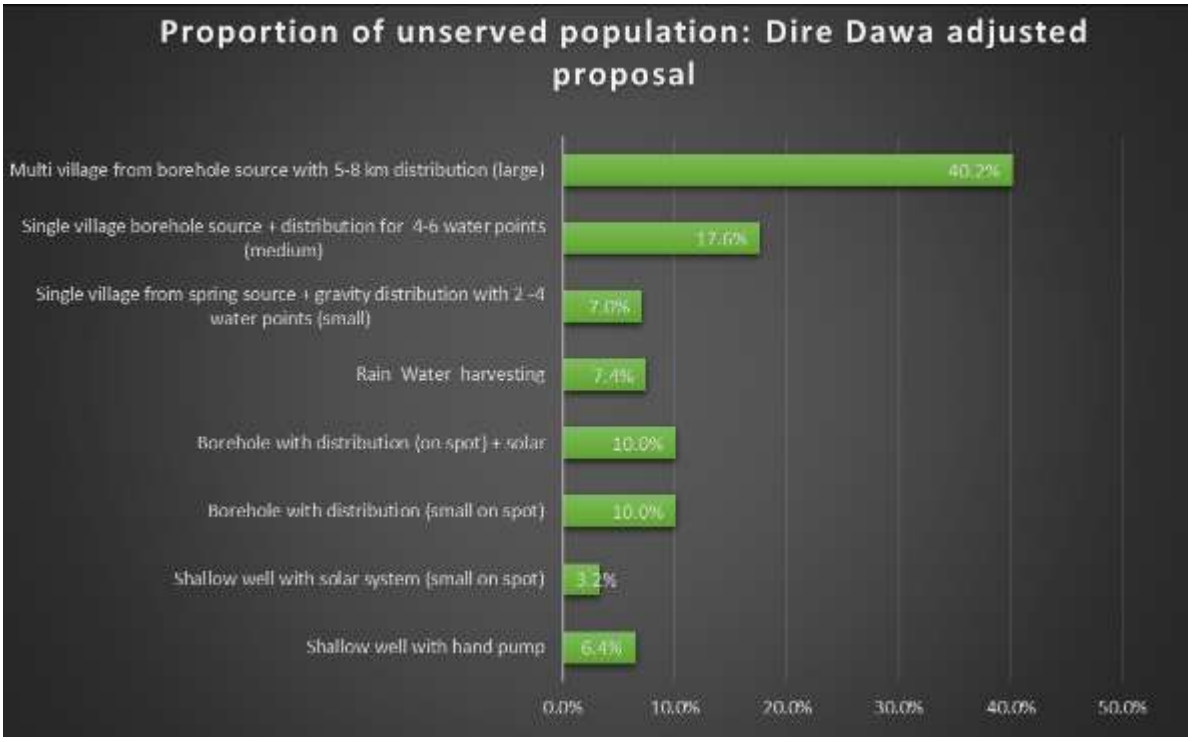
Technology mix for rural water

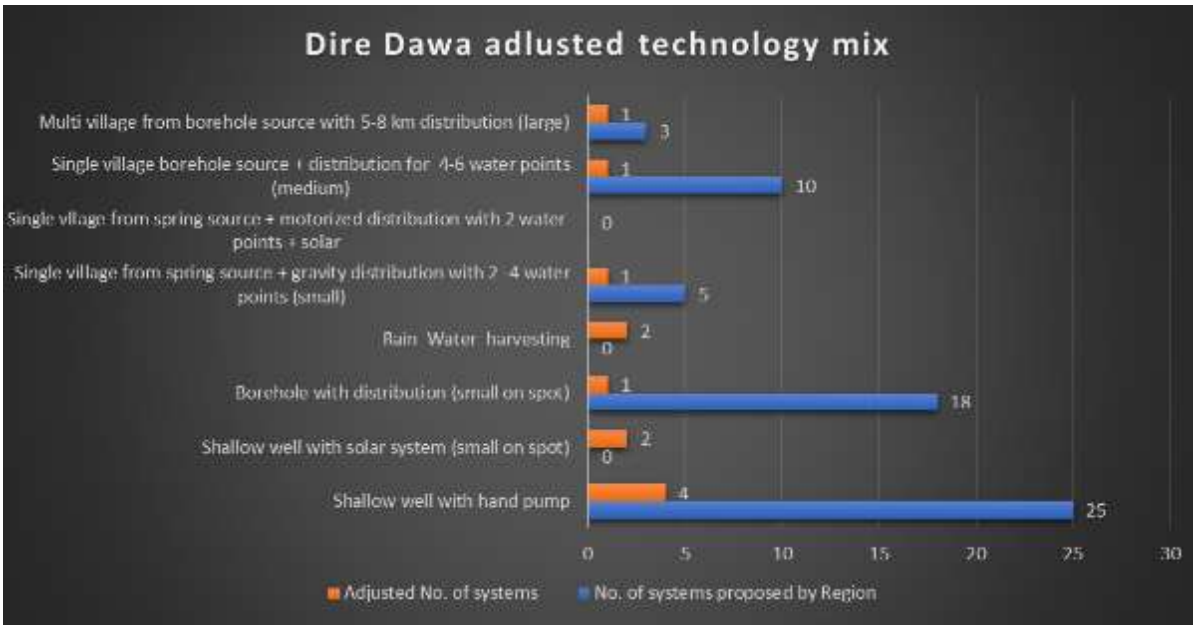
Dire Dawa rural - ADJUSTED

Unserved population to be served in the remaining three years according to data derived from draft MoWIE report 2009EFY	**19,923**

Type		Technology	No. of systems proposed by Region	Adjusted No. of systems	Adjust-ment %age	Av. population served per system in this region	Adjusted regional population to be served by this system	Proportion of unserved population	Unit cost per capita USD	Total cost USD	Notes
Self supply	1	Household Dug well with Rope Pump	0	0		6	0		133	0	
	2	Community Dug well with Rope Pump	0	0		42	0		32	0	
On spot	3	Dug well with Hand Pump	0	0		171	0		25	0	
	4	Shallow well with hand pump	25	4	16%	320	1,280	6.4%	127	162,058	
	5	Shallow well with **solar** system (small on spot)	0	2		320	640	3.2%	127	81,029	
	6	Borehole with distribution (small on spot)	18	1	6%	2,000	2,000	10.0%	110	219,239	
	7	Borehole with distribution (on spot) + **solar**	0	1		2,000	2,000	10.0%	110	219,239	
	8	Capped Spring	0	0		350	0		25	0	
	9	Rain Water harvesting	0	2		737	1,474	7.4%	29	42,452	
	10	Cistern	0	0		57	0		90	0	
	11	Hafir Dam	0	0		493	0		98	0	
		Other		0			0			0	
12. Single Village - spring	12a	Single village from spring source + gravity distribution with 2 -4 water points (small)	5	1	20%	1,400	1,400	7.0%	41	56,767	
	12b	Single vllage from spring source + motorized distribution with 2 water points (small)		0		1,444	0		130	0	
	12c	Single vllage from spring source + motorized distribution with 2 water points + **solar**		0		1,444			52	0	unit rate from Tigray
13. Multi Village - spring	13a	Multi village from spring source + gravity distribution with 4-6 water points (medium)	0	0		3,200	0	0.0%	55	0	
	13b	Multi village from spring source + gravity distribution with 6-10 water points (large)		0		8,100	0		38	0	
	13c	Multi village from spring source + motorized distribution with 4-6 water points (medium)		0		3,200	0		76	0	
	13d	Multi village from spring source + motorized distribution with 6-10 water points (large)		0		8,100	0		46	0	
	13e	Multi village from spring source + motorized distribution with 4-10 water points + **solar**		0						0	
14. Single Village - borehole	14a	Single village borehole source + distribution for 4-6 water points (medium)	10	1	10%	3,500	3,500	17.6%	101	353,468	
	14b	Single village borehole source + distribution for 4-6 water points + **Solar**		0						0	
15. Multi Village - borehole	15a	Multi village from borehole source with 5-8 km distribution (large)	3	1	33%	8,000	8,000	40.2%	74	590,604	
	15b	Multi village from borehole source with 5-8 km distribution + **Solar**		0						0	
	15c	Large multi village from one or more very deep boreholes with long km distribution		0		10,000			134	0	
16. Single Village - river	16	Single village from river source with treatment	0	0			0			0	
17. Multi Village -	17	Multi village from river source with treatment	0	0			0		115	0	
		Other								0	
		Totals	**61**	**13**			**20,294**	**101.9%**		**1,724,857**	

Adjust figures in col 4 based on best estimate to reach 100% in col 8





Summary of results for rural water hardware

As can be seen from **Table A3-11** below, there is reasonable correlation (in terms of overall cost but not the detailed make-up) between the regional proposals (Line 4) and the adjusted estimates (Line 14), except for Oromiya region which appears to have under-estimated the population to be served by a factor of 2 and the cost by a factor of 3.

Additional factors have been applied to the CR-WASH (CR-WASH) component (that is, using 2032 projected design population) in order to allow for anticipated population movements triggered by installation of reliable water supply. Overall rural water supply cost becomes **2,089 USD million,** of which **931 USD million** is for CR-WASH Program (Resilient and Sustainable Water Supply, Sanitation and Hygiene Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia), previously termed “CR-WASH”.

Table A3-11 Summary of results for rural water

	Rural water summary													
1	**Region**		**Tigray**	**Gambella**	**B. Gumuz**	**Harari**	**Somali**	**Amhara**	**Afar**	**SNNPR**	**Oromia**	**Dire Dawa**	**Addis A**	**Totals**
2	Original proposal from region	Number of schemes	4,924	1,216	796	45	6,418	25,620	631	12,331	13,222	61		65,264
3		population to be served, million	2.09	0.16	0.24	0.05	1.09	4.30	0.53	13.20	4.62	0.06		26.34
4		**cost, USD million***	**70.3**	**11.4**	**17.7**	**1.3**	**335.6**	**223.0**	**76.8**	**371.4**	**254.2**	**14.8**		**1,376.5**
5		Av unit rate USD/c	33.6	71.3	74.8	26.6	307.3	51.9	144.9	28.1	55.1	246.7		52.3
6	Recalcuated regional proposal based on average unit rates and population served per technology	Number of schemes	4,924	1,216	796	45	6,418	25,620	631	12,331	13,222	61		65,264
7		population to be served, million	1.72	0.16	0.25	0.11	1.80	6.25	0.56	4.69	5.14	0.11		20.78
8		cost, USD million*	112.3	14.1	12.5	9.1	223.2	141.2	64.8	274.0	294.6	10.5		1,156.3
9		Av unit rate USD/c	65.4	87.0	49.2	82.4	124.2	22.6	116.0	58.5	57.4	95.9		55.6
10	Adjusted target population and technology mix	Number of schemes	1,665	162	796	19	4,506	5,000	721	13,422	23,033	13		49,337
11		population to be served, million	0.78	0.05	0.25	0.03	1.24	2.04	0.66	6.27	9.08	0.02		20.41
12		cost, USD million*	63.4	2.6	12.5	2.7	160.1	111.1	85.2	367.6	543.9	1.7		1,350.7
13		Av unit rate USD/c	81	54	49	95	129	55	129	59	60	87		66
14		Factored cost totals, USD million	88.1	3.6	17.3	3.8	222.5	154.4	118.4	510.9	756.0	2.4	0.0	1,877.5
15	**Note 1 : To these figures have here been added factors for rehabilitation(3%),investigation,design and project management (12%) Environmental Safegurd, Water Safety Plans and Water Quality Mangment, , Catchment protection and Environmental management plansCatchment protection and Environmental management plans(6%?), inflation (10% for 3 years?) , combined 39%*													*1.39*
16	non-CR and CR WASH share estimates	Estimated %age mix of CR-WASH	20%	0%	0%	30%	100%	20%	100%	20%	30%	30%	0%	
17		Non CR-WASH %age	80%	100%	100%	70%	0%	80%	0%	80%	70%	70%	100%	
18		**Estimated non-CR WASH share, USD million**	**70.5**	**3.6**	**17.3**	**2.6**	**0.0**	**123.5**	**0.0**	**408.8**	**529.2**	**1.7**	**0.0**	**1,157.2**
19		Estimated CR WASH share, USD million	17.6	0.0	0.0	1.1	222.5	30.9	118.4	102.2	226.8	0.7	0.0	
20		Additional factor for 2032 design population to be used for large MV CR WASH schemes likely to trigger population movements	1.10	1.26	1.27	1.36	1.36	1.14	1.24	1.25	1.31	1.40		
21		**Total CR WASH, USD million**	**19.3**	**0.0**	**0.0**	**1.5**	**303.5**	**35.2**	**146.9**	**127.5**	**296.2**	**1.0**	**0.0**	**931.3**
22	**Final proposed totals**	*compare with Row 4 above*	**89.8**	**3.6**	**17.3**	**4.2**	**303.5**	**158.7**	**146.9**	**536.3**	**825.4**	**2.7**	**0.0**	**2,088.5**

Urban water supply

Urban population to be served under GTP2 by 2020 has been estimated as described in **Sub-section 16.7** and as summarized in the table, reproduced below:

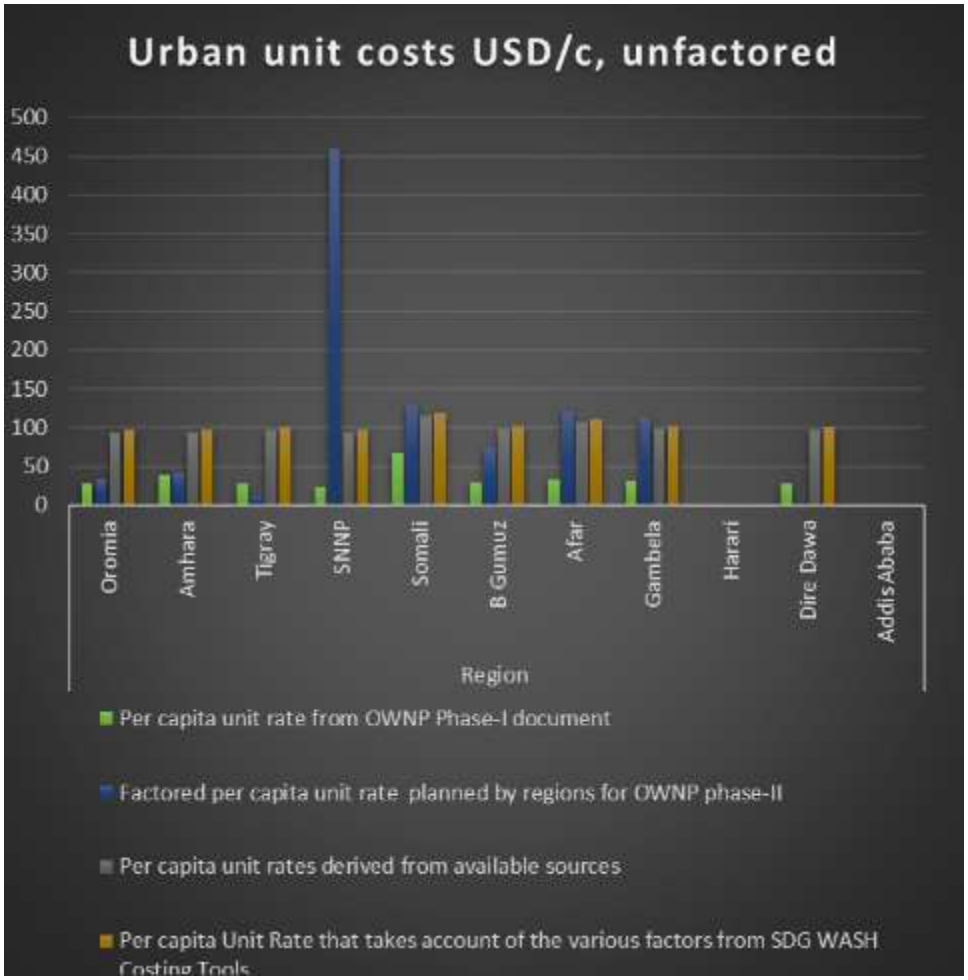
Unserved population to be served by 2020
432,321
143,914
708,479
1,883,051
94,922
1,199,688
72,874
22,194
149,770
77,912
863,777
5,648,901

Table A3-12 No of beneficiaries in urban areas to benefit in water supply access during Phase II

Per capita unit rates have been derived from all sources and variations are illustrated in the **Table A3-12** and figure below. Phase 1 estimates have proved to be too low and the recent rates used by the regions are considered to be unreliable. Hence limited information from other sources has been analyzed and is recommended for use.

Table A3-13 Urban unit water rates

	Urban water unit rates, USD per capita	Region										
2	Note: These rates are based on design population, assumed to be 2032	Oromia	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambela	Harari	Dire Dawa	Addis Ababa
3	Per capita cost national average of all category	91	91	91	91	91	91	91	91		91	
4	SDG WASH Costing Tools basic water estimate including price inflation for year 2017	94	94	94	94	94	94	94	94		94	
5	Regional Factor proposed in phase-I	1	1	1.05	1	1.25	1.1	1.25	1.1		1.05	
6	Regional factors developed from unit cost analyses of different NGOs and CWA project records	1.06	1.06	1.10	1.07	1.28	1.08	1.11	1.09		1.08	
7	Regional factors, average of above 2 rows	1.03	1.03	1.07	1.04	1.27	1.09	1.18	1.09		1.06	
8	Per capita unit rate from OWNP Phase-I document	28	39	28	23	67	30	33	31		28	
9	Factored per capita unit rate planned by regions for OWNP phase-II	34	43	11	459	130	74	122	113		1	
10	Regional unit rates from CR-WASH	127	127	133	127	145		145				
11	Per capita unit rates derived from available sources	94	94	98	94	115	99	107	100		97	
12	Per capita Unit Rate that takes account of the various factors from SDG WASH Costing Tools	97	97	101	97	119	102	111	103		100	
13	Average of above 2 rows recommended for use alongside CR-WASH figures	95	95	99	96	117	101	109	101		98	47
	Note: rates in Row 13 to be used, but supplemented by Row 10 according to proportion of very deep well schemes											



Urban technology mix

In order to achieve greater resilience and reliability, it has been decided to increase the mix of very deep boreholes in drought prone areas, both urban and rural. The funding source for the drought prone area interventions under CR-WASH (Resilient and Sustainable Water Supply, Sanitation and Hygiene Program in Arid and Semi-Arid Drought Prone Areas of Ethiopia) – previously termed "CR-WASH" - has been identified separate from other funding sources, so that the table below reflects this distinction.

The percentages of CR-WASH and non-CR-WASH are based on estimates from recent WASH Cluster reports: However, this will require inputs from both national experts and regional actors with local knowledge: The spreadsheet tool is designed to be user friendly so that this can be easily done.

Urban water costs

Table A3-14 below shows the calculations for urban water costs based on 75% population to be served under GTP2. Total costs are 1,832 million USD total of which 386 million USD falls under "CR-WASH". This compares with total 1,988 million USD total proposed by the regions. The differences include (a) a higher target population of 11.27 million used by the regions in aggregate compared with GTP2 target of 5.78 million (see **Table A3-12** above) and (b) while Oromiya region underestimated costs by half, SNNP region would appear to have overestimated urban costs by a factor of 7.

Note that the 1,832 million USD estimate is based on a standard 15-year (2032) design horizon which predicts around double the 2020 population to be served.

Table A3-14: Urban Water Supply Cost by Region

1	**Urban water costs to meet GTP2, USD million**	**Region**											
2	***Note**: These rates are based on design population, assumed to be that projected for 2032*	**Oromia**	**Amhara**	**Tigray**	**SNNP**	**Somali**	**B Gumuz**	**Afar**	**Gambela**	**Harari**	**Dire Dawa**	**Addis Ababa**	**Total**
3	**Unit rates from CR-WASH, USD/c**	**127**	**127**	**133**	**127**	**145**		**145**	**134**	**134**	**134**		
4	**Recommended for use for non CR-WASH, USD/c**	**95**	**95**	**99**	**96**	**117**	**101**	**109**	**101**	**123**	**98**	**319**	
5	Unserved population to be served by 2020, million	1.88	0.71	0.43	1.20	0.15	0.09	0.14	0.07	0.15	0.08	0.86	**5.78**
6	Estimated %age mix of CR-WASH to 2020, from latest	30%	20%	20%	20%	100%	0%	100%	0%	30%	30%	0%	**32%**
7	Non CR-WASH %age	70%	80%	80%	80%	0%	100%	0%	100%	70%	70%	100%	
8	Cost, USD million = Row 5 x (Row 3 x Row 6 + Row 4 x Row 7)	197.1	72.0	45.8	122.3	21.7	9.5	20.9	7.4	19.0	8.5	275.8	**800.0**
9	***Note**: To all these figures must be added factors for investigation, design and project management (15%),Environmental Safe guard(2%), Catchment Protection(2%), inflation (10% for 3 years) and risk (10%), combined 39%.*												*1.39*
10	**Totals**	**274.3**	**100.1**	**63.8**	**170.2**	**30.2**	**13.3**	**29.0**	**10.3**	**26.4**	**11.8**	**383.7**	**1,113.1**
11	**CR-WASH, USD million, without design factor**	82.3	20.0	12.8	34.0	30.2	0.0	29.0	0.0	7.9	3.5	0.0	**219.8**
12	**non-CR-WASH, USD million, without design factor**	192.0	80.1	51.0	136.2	0.0	13.3	0.0	10.3	18.5	8.3	383.7	**893.3**
13	*Factor to allow for use of 2032 design population compared with GTP2 2020 population for calculating costs*	1.76	1.92	1.85	1.90	1.46	2.19	1.85	2.03	1.44	1.40	1.33	
14	Totals with design factors USD million	483.3	192.5	118.2	323.4	44.0	29.1	53.8	20.8	38.1	16.5	512.1	**1,832**
15	CR-WASH, USD million, with design factor	145.0	38.5	23.6	64.7	44.0	0.0	53.8	0.0	11.4	5.0	0.0	385.9
16	non-CR-WASH, USD million, with design factor	338.3	154.0	94.6	258.7	0.0	29.1	0.0	20.8	26.7	11.6	512.1	1,445.8
17	Original regional proposal unserved population to be served by 2020, million	1.71	1.24	0.79	2.61	0.24	0.11	0.11	0.08	0.00	0.01	0.86	**7.77**
18	**Regional proposal, USD million**	**142.5**	**106.8**	**55.2**	**1242.2**	**57.0**	**16.5**	**39.1**	**50.3**	**0.0**	**2.7**	**275.8**	**1988.1**
19	Unit rate from regional proposal, USD/c	83	86	70	475	241	144	342	625		300	319	

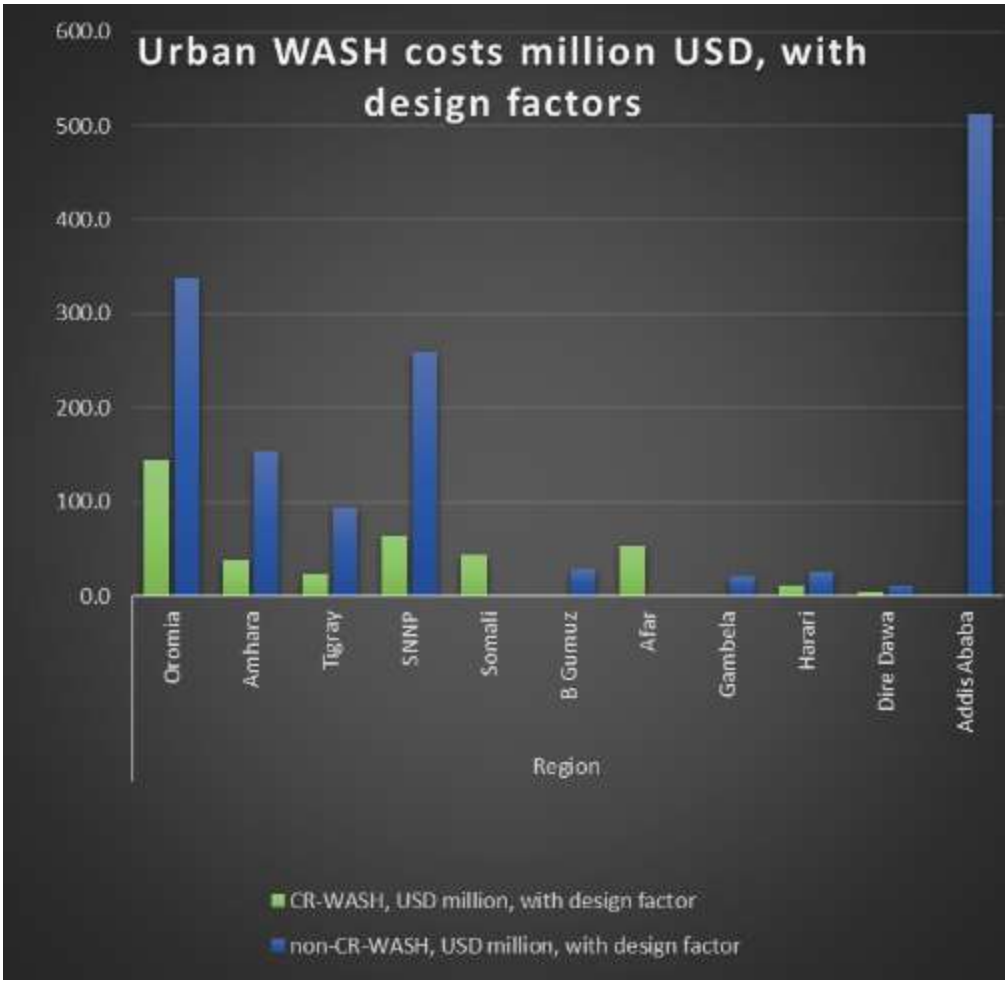

Urban WASH costs million USD, with design factors
600.0
500.0
400.0
300.0
200.0
100.0
0.0
Oromia
Amhara
Tigray
SNNP
Somali
B Gumuz
Afar
Gambela
Harari
Dire Dawa
Addis Ababa
Region
CR-WASH, USD million, with design factor
non-CR-WASH, USD million, with design factor

Table A3-15: Rural water supply summary program cost including other activity that are necessary for the component to function as intended by region and Year in Million USD

Sr No	Activities	Tigray	Gambella	B. Gumuz	Harari	Somali	Amhara	Afar	SNNPR	Oromiya	Dire Dawa	Total
1	Construction of water supplies in communities	64.584	2.57	12.46	6.72	160.06	111.10	85.19	367.59	543.90	1.72	**1,356**
	2018	6.46	0.26	1.25	0.67	16.01	11.11	8.52	36.76	54.39	0.17	
	2019	25.83	1.03	4.98	2.69	64.02	44.44	34.08	147.03	217.56	0.69	**542**
	2020	32.29	1.29	6.23	3.36	80.03	55.55	42.60	183.79	271.95	0.86	**678**
2	Rehabilitation of water supplies in communities	9.15	0.36	1.73	1.03	30.35	15.87	14.69	53.63	82.54	0.27	**210**
	2018	0.91	0.04	0.17	0.10	3.04	1.59	1.47	5.36	8.25	0.03	**21**
	2019	3.66	0.14	0.69	0.41	12.14	6.35	5.88	21.45	33.02	0.11	**84**
	2020	4.57	0.18	0.87	0.52	15.18	7.94	7.35	26.81	41.27	0.13	**105**
3	Study, Design and Project Management including catchment / sub-catchment groundwater investigation	11.89	0.47	2.25	1.35	39.46	20.64	19.10	69.72	107.30	0.35	**273**
	2018	1.19	0.05	0.23	0.13	3.95	2.06	1.91	6.97	10.73	0.03	**27**
	2019	4.76	0.19	0.90	0.54	15.78	8.25	7.64	27.89	42.92	0.14	**109**
	2020	5.95	0.23	1.13	0.67	19.73	10.32	9.55	34.86	53.65	0.17	**136**
4	Environmental Safeguard	3.93	0.15	0.74	0.44	13.05	6.83	6.32	23.06	35.49	0.12	**90**
	2018	0.39	0.02	0.07	0.04	1.31	0.68	0.63	2.31	3.55	0.01	**9**
	2019	1.57	0.06	0.30	0.18	5.22	2.73	2.53	9.22	14.20	0.05	**36**
	2020	1.97	0.08	0.37	0.22	6.53	3.41	3.16	11.53	17.75	0.06	**45**
5	Water Safety Plans and Water Quality Management	4.57	0.18	0.87	0.52	15.18	7.94	7.35	26.81	41.27	0.13	**105**
	2018	0.46	0.02	0.09	0.05	1.52	0.79	0.73	2.68	4.13	0.01	**10**
	2019	1.83	0.07	0.35	0.21	6.07	3.17	2.94	10.73	16.51	0.05	**42**
	2020	2.29	0.09	0.43	0.26	7.59	3.97	3.67	13.41	20.64	0.07	**52**
6	Catchment protection and Environmental management plans	2.74	0.11	0.52	0.31	9.11	4.76	4.41	16.09	24.76	0.08	**63**
	2018	0.27	0.01	0.05	0.03	0.91	0.48	0.44	1.61	2.48	0.01	**6**
	2019	1.10	0.04	0.21	0.12	3.64	1.90	1.76	6.44	9.90	0.03	**25**
	2020	1.37	0.05	0.26	0.16	4.55	2.38	2.20	8.04	12.38	0.04	**31**
7	**G. Total Cost by Region**	91.49153	3.57871	17.318354	10.346594	303.5374	158.748	146.9451	536.2994	825.4135	2.686376	**2,096**
	2018	9.15	0.36	1.73	1.03	30.35	15.87	14.69	53.63	82.54	0.27	**210**

Sr No	Activities	Tigray	Gambella	B. Gumuz	Harari	Somali	Amhara	Afar	SNNPR	Oromiya	Dire Dawa	Total
	2019	36.60	1.43	6.93	4.14	121.41	63.50	58.78	214.52	330.17	1.07	**839**
	2020	45.75	1.79	8.66	5.17	151.77	79.37	73.47	268.15	412.71	1.34	**1,048**

A3-16 Rural sanitation program costs and targets including CR-WASH

Region Name	Taking villages to Primary ODF village status		Taking villages to Secondary ODF village status		Taking villages to Safely Managed sanitation village status		Fixed Costs for training; supervision and monitoring	Regional costs	Total Costs (ETB)	Total Costs (USD)
	Estimated Cost	Physical Target	Estimated Cost	Physical Target	Estimated Cost	Physical Target				
Afar										
2018	3,088,683	205	2,844,124	220	9,480,414	220	2,007,360	582,000	18,003,224	642,972
2019	12,354,730	818	11,376,496	879	37,921,654	879	8,029,440	2,328,000	72,012,898	2,571,889
2020	15,443,413	1,023	14,220,621	1,099	47,402,068	1,099	10,036,800	2,910,000	90,016,122	3,214,862
Total	**30,886,825**	**2,046**	**28,441,241**	**2,198**	**94,804,136**	**2,198**	**20,073,600**	**5,820,000**	**180,032,244**	**6,429,723**
Amhara										
2018	19,749,694	2,145	29,933,048	3,360	31,296,961	3,513	13,545,380	2,284,400	96,818,501	3,457,804
2019	78,998,776	8,582	119,732,190	13,440	125,187,844	14,052	54,181,518	9,137,600	387,274,003	13,831,214
2020	98,748,471	10,727	149,665,238	16,800	156,484,806	17,566	67,726,898	11,422,000	484,092,504	17,289,018
Total	**197,496,941**	**21,454**	**299,330,475**	**33,600**	**312,969,611**	**35,131**	**135,453,796**	**22,844,000**	**968,185,008**	**34,578,036**
Benshangul Gumuz										
2018	3,390,807	105	7,554,250	250	4,510,000	250	967,600	297,200	16,720,463	597,159
2019	13,563,230	421	30,217,000	1,000	18,040,000	1,000	3,870,400	1,188,800	66,881,851	2,388,638
2020	16,954,037	527	37,771,250	1,250	22,550,000	1,250	4,838,000	1,486,000	83,602,314	2,985,797
Total	**33,908,074**	**1,053**	**75,542,500**	**2,500**	**45,100,000**	**2,500**	**9,676,000**	**2,972,000**	**167,204,627**	**5,971,594**
Dire Dawa										
2018	3,760,245	35	3,841,048	38	2,293,163	38	447,720	130,800	10,473,087	374,039
2019	15,040,981	140	15,364,191	152	9,172,651	152	1,790,880	523,200	41,892,348	1,496,155
2020	18,801,227	175	19,205,239	191	11,465,814	191	2,238,600	654,000	52,365,435	1,870,194
Total	**37,602,453**	**350**	**38,410,477**	**381**	**22,931,628**	**381**	**4,477,200**	**1,308,000**	**104,730,870**	**3,740,388**
Gambella										
2018	2,907,590	77	2,059,512	91	2,059,512	91	48,380	225,200	7,300,452	260,730
2019	11,630,358	307	8,238,048	364	8,238,048	364	193,520	900,800	29,201,809	1,042,922
2020	14,537,948	384	10,297,560	455	10,297,560	455	241,900	1,126,000	36,502,262	1,303,652
Total	**29,075,896**	**767**	**20,595,120**	**910**	**20,595,120**	**910**	**483,800**	**2,252,000**	**73,004,523**	**2,607,304**
Harari										
2018	981,147	8	2,093,461	19	1,249,828	19	59,040	82,800	4,466,323	159,512
2019	3,924,590	34	8,373,845	76	4,999,310	76	236,160	331,200	17,865,291	638,046
2020	4,905,737	42	10,467,306	96	6,249,138	96	295,200	414,000	22,331,614	797,558
Total	**9,811,474**	**84**	**20,934,612**	**191**	**12,498,276**	**191**	**590,400**	**828,000**	**44,663,228**	**1,595,115**
Oromiya										
2018	205,546,854	10,416	277,323,462	14,977	166,124,529	15,027	42,318,947	4,060,400	695,414,611	24,836,236
2019	822,187,417	41,665	1,109,293,848	59,906	664,498,115	60,108	169,275,787	16,241,600	2,781,658,445	99,344,944
2020	1,027,734,271	52,081	1,386,617,310	74,883	830,622,644	75,135	211,594,734	20,302,000	3,477,073,057	124,181,181
Total	**2,055,468,542**	**104,162**	**2,773,234,620**	**149,765**	**1,661,245,288**	**150,270**	**423,189,467**	**40,604,000**	**6,954,146,113**	**248,362,361**
SNNP										

Region Name	Taking villages to Primary ODF village status		Taking villages to Secondary ODF village status		Taking villages to Safely Managed sanitation village status		Fixed Costs for training; supervision and monitoring	Regional costs	Total Costs (ETB)	Total Costs (USD)
	Estimated Cost	Physical Target	Estimated Cost	Physical Target	Estimated Cost	Physical Target				
2018	10,718,911	5,614	30,221,548	3,166	56,635,069	9,196	32,483,903	2,068,400	132,145,807	4,719,493
2019	42,875,644	22,458	120,886,191	12,664	226,540,276	36,784	129,935,614	8,273,600	528,583,230	18,877,972
2020	53,594,555	28,072	151,107,739	15,830	283,175,345	45,980	162,419,517	10,342,000	660,729,037	23,597,466
Total	**107,189,109**	**56,144**	**302,215,478**	**31,659**	**566,350,690**	**91,960**	**324,839,034**	**20,684,000**	**1,321,458,074**	**47,194,931**
Somali										
2018	10,234,119	438	8,932,250	446	7,325,357	447	5,800,683	1,422,000	33,715,740	1,204,134
2019	40,936,476	1,753	35,729,000	1,785	29,301,428	1,787	23,202,733	5,688,000	134,862,962	4,816,534
2020	51,170,595	2,191	44,661,250	2,231	36,626,786	2,234	29,003,416	7,110,000	168,578,702	6,020,668
Total	**102,341,190**	**4,382**	**89,322,499**	**4,462**	**73,253,571**	**4,468**	**58,006,832**	**14,220,000**	**337,157,404**	**12,041,336**
Tigray										
2018	18,118,150	95	39,586,942	221	27,843,667	261	4,015,335	508,400	90,073,070	3,216,895
2019	72,472,599	380	158,347,768	885	111,374,668	1,042	16,061,339	2,033,600	360,292,281	12,867,582
2020	90,590,749	475	197,934,710	1,106	139,218,335	1,303	20,076,674	2,542,000	450,365,352	16,084,477
Total	**181,181,498**	**950**	**395,869,420**	**2,212**	**278,436,670**	**2,606**	**40,153,347**	**5,084,000**	**900,730,703**	**32,168,954**
Grand Total in Eth Birr	**2,784,962,002**	**191,392**	**4,043,896,442**	**227,878**	**-3,088,184,991**	**290,614**	**1,016,943,476**	**116,616,000**	**11,051,312,795**	**394,689,743**
2018	278,496,200	19,139	404,389,644	22,788	-308,818,499	29,061	101,694,348	11,661,600	1,105,131,280	39,468,974
2019	1,113,984,801	76,557	1,617,558,577	91,151	-1,235,273,996	116,246	406,777,390	46,646,400	4,420,525,118	157,875,897
2020	1,392,481,001	95,696	2,021,948,221	113,939	-1,544,092,496	145,307	508,471,738	58,308,000	5,525,656,398	197,344,872
Grand Total Total in USD	**99,462,928.66**	**6,835.42**	**144,424,872.94**	**8,138.48**	**110,292,321.09**	**10,379.08**	**36,319,409.86**	**4,164,857.14**	**394,689,742.68**	

Note: *Source of information is from Sanitation Micro planning prepared by UNICEF; see the detailed activities and unit costs in the separate micro planning document when available*

Table A3-17: Urban water supply Program Physical plan by region and Year in Number

Fiscal Year	Activities	Number of planned activities by Region and year											Total
		Oromiya	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambella	Harari	Dire Dawa	Addis Ababa	
I	Urban Water Supply												
2018	Study and Design	50	19	12	32	4	3	4	2	0.10	0.10	0.10	126
	New Construction	11	4	3	7	1	1	1	0				28
	Rehabilitation and expansion	39	15	9	25	3	2	3	2	0.10	0.10	0.10	98
2019	Study and Design	201	76	46	128	16	10	16	8	0.40	0.40	0.40	503
	New Construction	45	17	10	29	4	2	4	2				113
	Rehabilitation and expansion	156	59	36	100	12	8	12	6	0.4	0.4	0.4	390
2020	Study and Design	252	95	58	160	20	13	19	10	0.5	0.50	0.50	628
	New Construction	56	21	13	36	4	3	4	2				140
	Rehabilitation and expansion	196	74	45	125	16	10	15	8	0.5	0.5	0.5	488
	Study and Design	504	189	116	321	40	26	39	19	1	1	1	**1256**
	New Construction	112.5	42.3	25.8	71.7	9.0	6.0	9.0	4.0	0.0	0.0	0.0	**280**
	Rehabilitation and expansion	391	147	90	249	31	20	30	15	1	1	1	**976**

Table A3-18: Urban water supply program cost by region and Year in Million USD

Sr No	Activities	Oromiya	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambella	Harari	Dire Dawa	Addis Ababa	Total
1	**Construction of water supplies**	**294.79**	**117.40**	**72.10**	**197.26**	**26.82**	**17.76**	**32.81**	**12.71**	**23.23**	**10.10**	**312.38**	**1,117**
	2018	29.48	11.74	7.21	19.73	2.68	1.78	3.28	1.27	2.32	1.01	31.24	112
	2019	117.92	46.96	28.84	78.90	10.73	7.11	13.13	5.08	9.29	4.04	124.95	447
	2020	147.40	58.70	36.05	98.63	13.41	8.88	16.41	6.35	11.62	5.05	156.19	559
2	**Study, Design and Project Management, including catchment and or sub-catchment groundwater investigation**	**67.66**	**26.95**	**16.55**	**45.27**	**6.16**	**4.08**	**7.53**	**2.92**	**5.33**	**2.32**	**71.69**	**256**
	2018	6.77	2.69	1.65	4.53	0.62	0.41	0.75	0.29	0.53	0.23	7.17	26

Sr No	Activities	Oromiya	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambella	Harari	Dire Dawa	Addis Ababa	Total
	2019	27.06	10.78	6.62	18.11	2.46	1.63	3.01	1.17	2.13	0.93	28.68	103
	2020	33.83	13.47	8.27	22.64	3.08	2.04	3.77	1.46	2.67	1.16	35.85	128
3	**Immediate service improvement**	**48.33**	**19.25**	**11.82**	**32.34**	**4.40**	**2.91**	**5.38**	**2.08**	**3.81**	**1.65**	**51.21**	**183**
	2018	4.83	1.92	1.18	3.23	0.44	0.29	0.54	0.21	0.38	0.17	5.12	18
	2019	19.33	7.70	4.73	12.94	1.76	1.16	2.15	0.83	1.52	0.66	20.48	73
	2020	24.16	9.62	5.91	16.17	2.20	1.46	2.69	1.04	1.90	0.83	25.60	92
4	**Environmental Safeguard**	**24.16**	**9.62**	**5.91**	**16.17**	**2.20**	**1.46**	**2.69**	**1.04**	**1.90**	**0.83**	**25.60**	**92**
	2018	2.42	0.96	0.59	1.62	0.22	0.15	0.27	0.10	0.19	0.08	2.56	9
	2019	9.67	3.85	2.36	6.47	0.88	0.58	1.08	0.42	0.76	0.33	10.24	37
	2020	12.08	4.81	2.95	8.08	1.10	0.73	1.34	0.52	0.95	0.41	12.80	46
5	**Water Safety Plans and Water Quality Management**	**24.16**	**9.62**	**5.91**	**16.17**	**2.20**	**1.46**	**2.69**	**1.04**	**1.90**	**0.83**	**25.60**	**92**
	2018	2.42	0.96	0.59	1.62	0.22	0.15	0.27	0.10	0.19	0.08	2.56	9
	2019	9.67	3.85	2.36	6.47	0.88	0.58	1.08	0.42	0.76	0.33	10.24	37
	2020	12.08	4.81	2.95	8.08	1.10	0.73	1.34	0.52	0.95	0.41	12.80	46
3	**Catchment protection and Environmental management plans**	**24.16**	**9.62**	**5.91**	**16.17**	**2.20**	**1.46**	**2.69**	**1.04**	**1.90**	**0.83**	**25.60**	**92**
	2018	2.42	0.96	0.59	1.62	0.22	0.15	0.27	0.10	0.19	0.08	2.56	9
	2019	9.67	3.85	2.36	6.47	0.88	0.58	1.08	0.42	0.76	0.33	10.24	37
	2020	12.08	4.81	2.95	8.08	1.10	0.73	1.34	0.52	0.95	0.41	12.80	46
7	**G. Total Cost by Region**	**483**	**192**	**118**	**323**	**44**	**29**	**54**	**21**	**38**	**17**	**512**	**1,832**
	2018	48.33	19.25	11.82	32.34	4.40	2.91	5.38	2.08	3.81	1.65	51.21	183
	2019	193.31	76.99	47.28	129.35	17.59	11.65	21.52	8.33	15.24	6.62	204.84	733
	2020	241.63	96.23	59.09	161.69	21.98	14.56	26.90	10.42	19.04	8.27	256.05	916

Table A3-19 Urban Sanitation Activity and Financial Plan by Year

Fiscal Year	Activities	Number of planned activities by Region and year											Total
		Oromiya	Amhara	Tigray	SNNP	Somali	B/ Gumuz	Afar	Gambella	Harari	Dire Dawa	Addis Ababa	
2018	Sanitation services Improvement	0.60	0.40	0.20	0.20	0.20	0.10	0.10	0.10	0.10	0.10	0.10	2
	Water supply and operational efficiency improvement (#Towns)	0.60	0.40	0.20	0.20	0.20	0.10	0.10	0.10	0.10	0.10	0.10	2
	Project management and institutional development	0.60	0.40	0.20	0.20	0.20	0.10	0.10	0.10	0.10	0.10	0.10	2
	Public Toilets Construction in 973 towns	32.40	12.20	7.50	20.60	2.60	1.60	2.50	1.30	0.40	1.30	14.90	97
	Communal Toilets Construction in 973 towns	32.40	12.20	7.50	20.60	2.60	1.60	2.50	1.30	0.40	1.30	14.90	97
	School Toilets Construction in 973 towns	32.40	12.20	7.50	20.60	2.60	1.60	2.50	1.30	0.40	1.30	14.90	97
	14 towns Study and design	0.90	0.60	0.40	0.40	0.40	0.20	0.20	0.20	0.10	0.10	0.10	4
	Rehabilitation	11.00	4.00	2.50	6.60	0.80	0.80	1.00	1.00	0.10	0.10	0.10	28
	Sub-Total planned for the year 2018 (Million USD)	**12.68**	**11.46**	**5.21**	**7.53**	**2.41**	**0.60**	**0.79**	**0.85**	**1.57**	**3.37**	**28.34**	**75**
2019	Sanitation services Improvement	2.40	1.60	0.80	0.80	0.80	0.40	0.40	0.40	0.40	0.40	0.40	8.80
	Water supply and operational efficiency improvement	2.40	1.60	0.80	0.80	0.80	0.40	0.40	0.40	0.40	0.40	0.40	8.80
	Project management and institutional development	2.40	1.60	0.80	0.80	0.80	0.40	0.40	0.40	0.40	0.40	0.40	8.80
	Public Toilets Construction in 973 towns	129.60	48.81	30.00	82.40	10.40	6.40	10.00	5.20	1.60	5.20	59.60	389
	Communal Toilets Construction in 973 towns	129.60	48.81	30.00	82.40	10.40	6.40	10.00	5.20	1.60	5.20	59.60	389
	School Toilets Construction in 973 towns	129.60	48.81	30.00	82.40	10.40	6.40	10.00	5.20	1.60	5.20	59.60	389
	14 towns Study and design	3.60	2.40	1.60	1.60	1.60	0.80	0.80	0.80	0.40	0.40	0.40	14.40
	Rehabilitation	44.00	16.00	10.00	26.40	3.20	3.20	4.00	4.00	0.40	0.40	0.40	112.00
	Sub-Total planned for the year 2019 (Million USD)	**50.72**	**45.83**	**20.85**	**30.14**	**9.64**	**2.42**	**3.18**	**3.40**	**6.29**	**13.46**	**113.36**	**299**
2020	Sanitation services Improvement	2.40	1.60	0.80	0.80	0.80	0.40	0.40	0.40	0.40	0.40	0.40	8.80
	Water supply and operational efficiency improvement	3.00	2.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	0.50	11.00
	Project management and institutional development	3.00	2.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	0.50	11.00
	Public Toilets Construction in 973 towns	162.00	61.02	37.50	103.00	13.00	8.00	12.50	6.50	2.00	6.50	74.50	487

Fiscal Year	Activities	Number of planned activities by Region and year											Total
		Oromiya	Amhara	Tigray	SNNP	Somali	B/ Gumuz	Afar	Gambella	Harari	Dire Dawa	Addis Ababa	
	Communal Toilets Construction in 973 towns	162.00	61.02	37.50	103.00	13.00	8.00	12.50	6.50	2.00	6.50	74.50	487
	School Toilets Construction in 973 towns	162.00	61.02	37.50	103.00	13.00	8.00	12.50	6.50	2.00	6.50	74.50	487
	14 towns Study and design	4.50	3.00	2.00	2.00	2.00	1.00	1.00	1.00	0.50	0.50	0.50	18.00
	Rehabilitation	55.00	20.00	12.50	33.00	4.00	4.00	5.00	5.00	0.50	0.50	0.50	140.00
	Sub-Total planned for the year 2019(Million USD)	**63.40**	**57.28**	**26.06**	**37.67**	**12.05**	**3.02**	**3.97**	**4.26**	**7.87**	**16.83**	**141.70**	**374**
Total Million USD in three years	**Grand Total Urban sanitation (Million USD)**	**126.81**	**114.56**	**52.13**	**75.34**	**24.09**	**6.04**	**7.95**	**8.51**	**15.73**	**33.65**	**283.40**	**748**

Note 1: For urban sanitation the planned activities in 22 towns implementation is started in the current year and for the remaining 14 towns study and design is expected to be executed in the coming two years of GTP-2 period. Other onsite urban sanitation activities like communal, public and school latrine are planned as per needs base study proposal of IUSHS&SSAP.

Note 2: Some of the planned activities described above are presented in decimal points since project activities may not be complete within one year: For overall GTP2 target budgeting purposed it is assumed that 10%, 40% and 50% will be completed in 2018, 2019 and 2020 respectively.

Table A3-20: Institutional WASH: Health Center WASH Facility including Rehabilitation by Region and year in (USD)

Region	Health Center WASH Cost in rural areas (USD)			Heath Center in urban areas (USD)			Total Cost (USD)
	2018	2019	2020	2018	2019	2020	
Addis Ababa	0	0	0	90,000	360,000	450,000	900,000
Afar	136,351	545,404	681,755	197,857	791,429	989,286	3,342,080
Amhara	427,939	1,711,758	2,139,697	780,000	3,120,000	3,900,000	12,079,394
Benshangul Gumuz	0	0	0	38,500	154,000	192,500	385,000
Dire Dawa	0	0	0	14,500	58,000	72,500	145,000
Gambella	0	0	0	189,679	758,714	948,393	1,896,786
Harari	5,624	22,496	28,120	25,750	103,000	128,750	313,740
Oromiya	651,242	2,604,969	3,256,212	7,036	28,143	35,179	6,582,781
SNNP	535,360	2,141,440	2,676,800	1,331,464	5,325,857	6,657,321	18,668,243
Somali	101,364	405,457	506,821	686,214	2,744,857	3,431,071	7,875,786
Tigray	375,771	1,503,086	1,878,857	85,786	343,143	428,929	4,615,571

Table A3-21 Institutional WASH: Health Post WASH Facility including Rehabilitation by Region and year in (USD)

No	Region	Health Post WASH Cost in rural areas (ETB)			Total (USD)
		2018	2019	2020	
1.	Addis Ababa	-	-	-	-
2.	Afar	201,971	807,886	1,009,857	2,019,714
3.	Amhara	1,659,397	6,637,589	8,296,986	16,593,973
4.	Benshangul Gumuz	180,992	723,967	904,959	1,809,918
5.	Dire Dawa	-	-	-	-
6.	Gambella	66,497	265,988	332,485	664,969
7.	Harari	-	-	-	-
8.	Oromiya	1,615,259	6,461,036	8,076,295	16,152,589
9.	SNNP	2,197,407	8,789,628	10,987,035	21,974,069
10.	Somali	784,188	3,136,752	3,920,940	7,841,879
11.	Tigray	270,283	1,081,131	1,351,414	2,702,827
12.	**Total**	**6,978,012**	**27,905,995**	**34,881,990**	**69,759,939**

Table A3-22 Institutional WASH: Primary School WASH Facility including rehabilitation by Region and year in (USD)

Region	Primary schools rural areas			Primary schools urban areas			Total Cost (USD)
	2018	2019	2020	2018	2019	2020	
Addis Ababa	0	0	0	226,529	906,114	1,132,643	2,265,286
Afar	1,690,976	6,763,905	8,454,881	0	0	0	16,909,763
Amhara	12,908,971	51,635,885	64,544,857	97,743	390,971	488,714	130,067,142
Benshangul Gumuz	913,723	3,654,891	4,568,614	0	0	0	9,137,227
Dire Dawa	52,638	210,551	263,189	14,429	57,714	72,143	670,664
Gambella	318,088	1,272,353	1,590,441	0	0	0	3,180,883
Harari	95,484	381,935	477,419	55,484	221,937	277,421	1,509,680
Oromiya	22,060,104	88,240,418	110,300,522	9,703	38,811	48,514	220,698,073
SNNP	16,448,770	65,795,080	82,243,850	722,464	2,889,857	3,612,321	171,712,342
Somali	5,770,497	23,081,987	28,852,483	0	0	0	57,704,967
Tigray	663,399	2,653,595	3,316,993	40,432	161,726	202,158	7,038,302
Total	**60,922,650**	**243,690,600**	**304,613,250**	**1,126,351**	**4,505,405**	**5,631,756**	**620,894,329**

Table A3-23 Institutional WASH: Secondary School WASH Facility including rehabilitation by Region and year in (USD)

Region	Secondary schools (both rural and urban)			Total WASH in schools (US$)
	2018	2019	2020	
Addis Ababa	242,544	970,176	1,212,720	**2,425,440**
Afar	38,105	152,421	190,526	**381,052**
Amhara	384,257	1,537,026	1,921,283	**3,842,566**
Benshangul Gumuz	1,561,929	6,247,715	7,809,643	**15,619,287**
Dire Dawa	397,375	1,589,500	1,986,875	**3,973,750**
Gambella	144,360	577,441	721,802	**1,443,603**
Harari	680,036	2,720,144	3,400,180	**6,800,360**
Oromiya	86,958	347,831	434,789	**869,578**
SNNP	12,123	48,494	60,617	**121,234**
Somali	153,691	614,763	768,454	**1,536,908**
Tigray	13,575	54,300	67,875	**135,750**
Total	**3,714,953**	**14,859,811**	**18,574,764**	**37,149,528**

Table A3-24: Capacity Building and. Program Management Costs by Region and Year (million USD)

No.	Activity	Oromiya	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambella	Harari	Dire Dawa	Federal	Total (million USD)
1	**Program management**												**34**
	2018	0.81	0.48	0.25	0.43	0.27	0.13	0.17	0.13	0.07	0.00	0.66	3
	2019	3.25	1.92	0.99	1.72	1.06	0.53	0.68	0.51	0.29	0.00	2.64	14
	2020	4.07	2.41	1.24	2.14	1.33	0.67	0.85	0.63	0.37	0.00	3.29	17
	Total	8.14	4.81	2.48	4.29	2.66	1.34	1.70	1.26	0.74		6.59	34
2	**Advocacy**												**12.0**
	2018	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.06	
	2019	0.46	0.46	0.46	0.46	0.46	0.46	`	0.46	0.46	0.46	0.24	
	2020	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.30	
	Total	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	0.60	12.00
3	**Capacity Building Costs including TVETCs and HSCs, Training Manual Preparation, Procurement of Software, Motor Bikes and Vehicles**												**100**
	2018	3.83	1.44	0.88	2.44	0.30	0.19	0.29	0.15	0.31	0.16	0.00	10
	2019	15.33	5.77	3.52	9.77	1.22	0.77	1.17	0.59	1.22	0.63	0.00	40

No.	Activity	Oromiya	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambella	Harari	Dire Dawa	Federal	Total (million USD)
	2020	19.16	7.21	4.40	12.21	1.52	0.97	1.46	0.74	1.53	0.79	0.00	50
	Total	38.33	14.42	8.80	24.42	3.05	1.93	2.93	1.48	3.06	1.59	0.00	100
4	**Training of Key Utility staffs on water governance such as asset management, leakage management, customer management etc.**												**20**
	2018	0.77	0.29	0.18	0.49	0.06	0.04	0.06	0.03	0.06	0.03	0.00	2
	2019	3.07	1.15	0.70	1.95	0.24	0.15	0.23	0.12	0.24	0.13	0.00	8
	2020	3.83	1.44	0.88	2.44	0.30	0.19	0.29	0.15	0.31	0.16	0.00	10
	Total	7.67	2.88	1.76	4.88	0.61	0.39	0.59	0.30	0.61	0.32	0.00	20
5	**Establish Water supply quantity and quality monitoring system**												8
	2018	0.31	0.12	0.07	0.20	0.02	0.02	0.02	0.01	0.02	0.01	0.00	1
	2019	1.23	0.46	0.28	0.78	0.10	0.06	0.09	0.05	0.10	0.05	0.00	3
	2020	1.53	0.58	0.35	0.98	0.12	0.08	0.12	0.06	0.12	0.06	0.00	4
	Total	3.07	1.15	0.70	1.95	0.24	0.15	0.23	0.12	0.24	0.13	0.00	8
7	**Capacity Building, Software, Procurement Vacuum suction trucks and other seed money for research, promotion etc. for urban sanitation program**												**70**
	2018	2.69	1.01	0.62	1.72	0.21	0.14	0.21	0.10	0.21	0.11	0.00	7
	2019	10.77	4.05	2.47	6.86	0.86	0.54	0.82	0.42	0.86	0.45	0.00	28
	2020	13.46	5.06	3.09	8.58	1.07	0.68	1.03	0.52	1.07	0.56	0.00	35
	Total	26.92	10.13	6.18	17.15	2.14	1.36	2.06	1.04	2.15	1.11	0.00	70
9	**Support to Supply Chains**												**14**
	2018	0.54	0.20	0.12	0.34	0.04	0.03	0.04	0.02	0.04	0.02		1
	2019	2.15	0.81	0.49	1.37	0.17	0.11	0.16	0.08	0.17	0.09		6
	2020	2.68	1.01	0.62	1.71	0.21	0.14	0.21	0.10	0.21	0.11		7
	Total	5.37	2.02	1.23	3.42	0.43	0.27	0.41	0.21	0.43	0.22		14
11	**Self-Supply Technical Assistance**												**15**
	2018	0.57	0.22	0.13	0.37	0.05	0.03	0.04	0.02	0.05	0.02	0.00	2
	2019	2.30	0.87	0.53	1.47	0.18	0.12	0.18	0.09	0.18	0.10	0.00	6
	2020	2.87	1.08	0.66	1.83	0.23	0.14	0.22	0.11	0.23	0.12	0.00	8
	Total	5.75	2.16	1.32	3.66	0.46	0.29	0.44	0.22	0.46	0.24	0.00	15
13	**Post construction Support**												**12**
	2018	0.46	0.17	0.11	0.29	0.04	0.02	0.04	0.02	0.04	0.02	0.00	1
	2019	1.84	0.69	0.42	1.17	0.15	0.09	0.14	0.07	0.15	0.08	0.00	5
	2020	2.30	0.87	0.53	1.47	0.18	0.12	0.18	0.09	0.18	0.10	0.00	6
	Total	4.60	1.73	1.06	2.93	0.37	0.23	0.35	0.18	0.37	0.19	0.00	12
14	**M&E, MIS and Data Management**												**159**
	2018	3.80	2.25	1.16	2.01	1.24	0.62	0.80	0.59	0.34	0.00	3.08	16

No.	Activity	Oromiya	Amhara	Tigray	SNNP	Somali	B Gumuz	Afar	Gambella	Harari	Dire Dawa	Federal	Total (million USD)
	2019	15.22	9.00	4.64	8.02	4.97	2.50	3.18	2.37	1.38	0.00	12.33	64
	2020	19.02	11.25	5.80	10.03	6.22	3.12	3.98	2.96	1.72	0.00	15.41	79
	Total	38.05	22.50	11.59	20.06	12.43	6.25	7.95	5.91	3.44		30.81	159
	Grand Total												**444**

Table A3-25: Technical Assistance - Pastoralist WASH million USD

N0	Technical Assistance	Number	2018	2019	2020	Total USD million
1	Resource mapping and feasibility study for WASH facility	6		3.60	5.40	9.00
2	Appropriate water supply and sanitation Technology	6		2.16	3.24	5.40
3	Establishment of Scheme management System and Build capacity (For Spot supply and MVS) of water supplies	6		1.44	2.16	3.60
	Total			**7.20**	**10.80**	**18.00**

Note: The technical assistance for pastoralist WASH is planned in six regions; Somali, Afar, Oromia, Amhara, SNNP and Tigray

Table A3-26: Support to Research and technical assistance for regional water bureau and private institute million USD

It.No	Description of activities	Years			
		2018	2019	2020	Total(Million US$)
1	Support to Research and Water Technology institute	-	2.00	3.00	5.00
2	Technical assistance for Regional bureau & Local Drilling private institute	-	4.00	6.00	10.00
	Total		**6.00**	**9.00**	**15.00**

Table A3-27 CR-WASH Program for all components in million USD

No.	Activity	Oromiya	Amhara	Tigray	SNNP	Somali	Afar	Harari	Dire Dawa	Total USD million
1	**Rural Water Supply**									
	2019	140	23	14	61	110	64	5	2	**418**
	2020	171	29	17	74	135	78	6	2	**511**
	Total	**311**	**52**	**30**	**135**	**245**	**141**	**11**	**4**	**929**
2	**Urban Water Supply**									
	2019	58	10	6	25	45	26	2	1	**173**
	2020	71	12	7	31	56	32	2	1	**211**
	Total	**128**	**21**	**13**	**56**	**101**	**58**	**4**	**2**	384
3	**Rural Sanitation**									
	2019	19	3	2	8	15	9	1	0	**57**
	2020	23	4	2	10	18	11	1	0	**69**
	Total	**42**	**7**	**4**	**18**	**33**	**19**	**1**	**1**	126
4	**Urban Sanitation**									
	2019	36	6	4	16	28	16	1	0	**107**
	2020	44	7	4	19	34	20	2	1	**131**
	Total	**80**	**13**	**8**	**35**	**63**	**36**	**3**	**1**	238
5	**For school and Health facility**									
	2019	38	6	4	16	30	17	1	1	**112**
	2020	46	8	5	20	36	21	2	1	**137**
	Total	**84**	**14**	**8**	**36**	**66**	**38**	**3**	**1**	250
6	**Capacity Building and Program Management**									
	2019	22	4	2	10	18	10	1	0	**67**
	2020	27	5	3	12	22	12	1	0	**82**
	Total	**50**	**8**	**5**	**22**	**39**	**23**	**2**	**1**	149
7	**Monitoring and evaluation**									
	2019	11	2	1	5	9	5	0	0	**34**
	2020	14	2	1	6	11	6	0	0	**41**

No.	Activity	Oromiya	Amhara	Tigray	SNNP	Somali	Afar	Harari	Dire Dawa	Total USD million
	Total	**25**	**4**	**2**	**11**	**20**	**11**	**1**	**0**	74
8	**Program management 0.5%**									
	2018									**1.08**
	2019									**4.84**
	2020									**5.38**
	Total									**11**
	Grand Total	**719**	**120**	**71**	**313**	**566**	**327**	**25**	**10**	**2161**

Table A3-28 Program cost summary of all five program components million USD

Sr No	Program Components	Total	
		USD million	share %age
1	**Rural WASH**	**1431**	22%
1.1	Rural water	1162	
1.1	Rural sanitation and hygiene	269	
2	**Urban WASH**	**1955**	30%
2.1	Urban water	1446	
2.2	Urban sanitation	509	
3	**Institutional WASH**	**534**	8%
4	**Capacity Building and Program Management**	**477**	7%
4.1	Capacity Building and Program Management	318	
4.2	Monitoring and Evaluation	159	
5	**CR-WASH**	**2161**	33%
5.1	Rural water	934	
5.2	Rural sanitation and hygiene	126	
5.3	Urban water	386	
5.4	Urban sanitation	239	
5.5	Institutional WASH	251	
5.6	Capacity Building and Program Management	150	
5.7	Monitoring and evaluation	75	
	Total	**6,557**	**100%**

Annex 4: Sanitation and Hygiene Implementation in Rural and Pastoralist Areas: 2018-2020

1. Introduction

Sanitation and hygiene issues are the most important and yet the list prioritized activities in the world and more so in Ethiopia. Politicians, artists, environmentalists and many other prominent people don't advocate for sanitation and hygiene. Sanitation is not an appealing word like water, medicine, clinic, hospital, school, economy etc. But,

- Water can be useless if handled in unsanitary conditions,
- expensive drugs has to be imported to treat sicknesses caused by unsanitary conditions,
- students cognitive power, healthy height and weight, nutrition etc is affected by parasitic infections
- The economy of a country is compromised due to sickness, absence from work, medical cost etc.

Box 1

Why Community Centred Approach?

1. If people can forward their opinion on processes that affect them in this case the problem of sanitation and hygiene and make them part of the change process it will give them an intrinsic
   Satisfaction and power. "Community action is valid if the aim of community involvement in thinking, planning, deciding, acting and evaluating is taken seriously"

2. When local population fully participate in planning and decision making and accomplish a project the community collectively consider it as their own project completed to satisfy their desire which make them proud of their accomplishment and commit to sustain it.

3. When communities are involved to form one common ground for change it means they have made their decision for a cause and inherently they will respect and follow the actions they planned and the process they help create.

4. Involving the community will help in tapping indigenous knowledge and skills which are well adapted and respected.

5. One way of communicating to communities on poverty and the relationship of sanitation and hygiene as a cross cutting issue for development and poverty alleviations is only when the center of planning and action are the communities. Reaching out to the bottom 40% of people is much easier if communities are empowered to lead WASH programs and change processes at their level

According to many studies, malnutrition, environmental conditions and infectious diseases are highly associated and affect children under five years of age. Childhood malnutrition is associated with, according to Caulfield with diseases, poor mental development and reduced learning ability (Alderman and others, 2006).

In a study by World Bank titled "repositioning nutrition as central to development "placed nutrition as a central issue and established that malnutrition is not due to lack of food only but also the result of environment risk factors. A recent ESI desk review conducted by WSP[82]with consent from FMOH indicates that poor sanitation costs Ethiopia Birr 13.5 billion each year, equivalent to about Birr 170 per person per year or 2.1% of the national GDP. In order to deal with WASH related infectious diseases, nutritional disorders and improve the national economy the government of

[82] WSP (2015) Desk review on Economics of Sanitation (ESI) for Ethiopia, unpublished

Ethiopia together with development partners, have paid substantial attention to rural hygiene and sanitation improvement through the Health Extension program (since 2004). Therefore, In view of the risks and behaior and practice deficits prevailing in the country at large the focus areas for intervention are the following

It is therefore high time that there is a need for a paradigm shift from business as usual approach we have been following in the past to a more pragmatic methods or approaches to achieve a sustainable change. The approach is to make the communities responsible for improved sanitation and hygiene through "Community Centerd" approach which would empower communities through training of prominent, respected, influential people such as religious leaders, women groups, elders, teachers and students.(see box)

2. Objectives of the Community Centerd Approach

The main objective of the strategy is to delineate the ways and means of achieving the National target through organizing a community centerd approach, providing guidelines and capacity building on life skills by addressing key barriers, identifying and involving key sector stakeholders and strengthening enabling conditions
The specific objectives are:

a. Introduce the community Centerd approach to 100% of all concerned Regional, Woreda and kebele level leaders, other stakeholders and partners by April 2008.
b. Increase awareness and knowledge for attitudinal change to 80% of the population in Ethiopia by 2020.
c. Increase the availability and consistent use of improved latrine to 82% by the end of 2020.
d. Increase the number of households practicing hand Washing with soap at all critical moments by 70% by the end of 2020.
e. Establish sanitation marketing to provide improved and affordable sanitation options in at least 40% of woredas by 2020.
f. Reduce feco-oral disease transmission through the promotion of hygiene and sanitation behavior change in 70% of communities in Ethiopia by 2020.
g. Mobilize communities in rural and urban areas to use animal dung, chicken waste and human excreta to produce biogas plants for collective use in 30% of households in communities by 2020.
h. Support the establishment of a simple and practical approach for small towns so that solid, liquid and human excreta disposal problem currently prevailing in small towns will be improved in at least 80% of small town municipalities by 2020.
i. Establish a robust rural and urban water quality monitoring mechanism to inform One WASH National Program Steering Committee members three times a year.
j. Strengthen and support water, sanitation and hygiene monitoring and reporting System.

3. Goals of the Community Centerd Approach

Reach out to all (100%) of households and mobilize communities with a view for a rapid change in improved sanitation, water safety and hygienic practice by everyone in all communities in Ethiopia by 2020 and beyond.

4. The Guiding Principles for Community Centerd Approach

a. Empower communities and make the communities (households) the center of planning, action and follow up for sustainable hygiene and environmental health/sanitation behaior change by way of which enhance local involvement, using local aspiration, knowledge and skill and local motivation and action.
b. Engaging political leaders and key local residents from federal, regional and local levels and key influential people such as religious leaders, women groups, youth at the regional, woreda, kebele and community levels
c. Catalysing "the multiples"

- Using a multi-level (national, Regional, Zonal, Woreda, Kebele and Community levels) advocacy and planning
- Engaging multi–sectoral partners (health, education, water, development partners youth, women, private commercial),
- multi-communication channel (face-to-face, community events, religious institutions, school curriculum, mass media, advocacy, IEC, mobile film shows, drama, soap opera, etc)

d. Aligning all Hygiene and Environmental Health Programs with the Health Extension program emphasizing the role of Health Extension Workers (HEWs)and Women Health development Army (WHDA)

e. Base all Hygiene and sanitation interventions on the local context (existing beliefs, norms aspirations and practices and behaior approximations)

f. Focus on feasible behaior than jumping direct to ideal behaior. Environmental health/Sanitation improvement program should address the problem incrementally basing the intervention program on do-able actions using local skill and available local material at the beginning and build up there to introduce a more robust and ideal systemy.

g. g. Advocacy for WASH as a barrier of disease. From an epidemiological perspective, safe water, clean sanitation and proper hygiene practices are the first barrier to many WASHand behaior related diseases,

h. Promoting consistent and correct practice of Hygiene and Environmental Health /Sanitation related key behaiors through a focus on benefits beyond health benefits (honour, beauty, Godliness, privacy, dignity, comfort, safety)

i. Supporting the expansion of sanitation marketing for affordable, technically feasible key sanitation and hygiene technologies and supplies.

j. Developing and implementing a behaior-based monitoring and improvement system for refining the intervention

k. Environmental Health/sanitation program focus on needs Sanitation program should equally address the needs, preferences, and behaiors of children, women, men and persons with disabilities.

5. Strategic Component

Based on the evidence base, behavioral analysis and country experience, the strategy is composed of several **cross-cutting strategic components (or axis).**

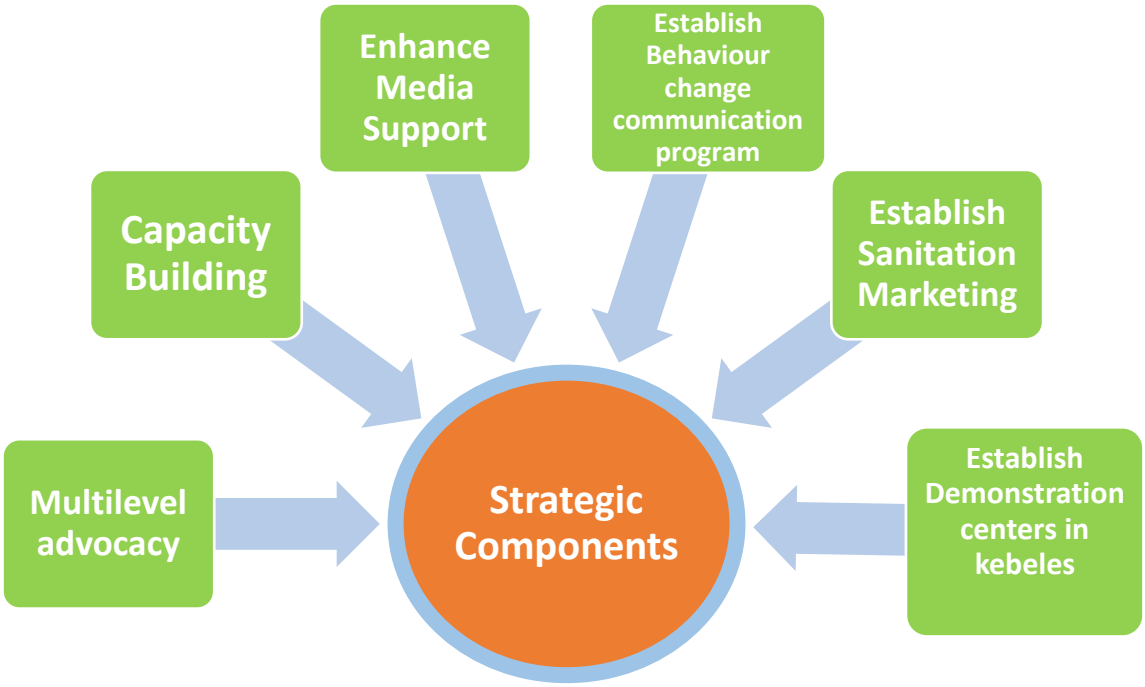


Figure A5.1

SC1: Multi-Level Advocacy
Advocacy activities will be multi-level. National, regional and local authorities will be targeted to promote Hygiene and Sanitation Improvement, acknowledging some and inviting others for specific actions, programs, support and enforcement. Officials at all appropriate levels will be guided to understand the role they can play in achieving the National strategic goals.

SC 2: Strengthening Household and Community hygiene and sanitation/environmental health conditions.
Community mobilization and household visits are essential for hygiene behaior change. This will be achieved by coordinated and independent activities of government and NGO partners. The Health Extension Worker together with trained community resource people and the development armies organized at community levels are to be the primary promoters on domestic hygiene and sanitation in all communities.
Environmental Health workers/ Sanitarians, WASH Volunteers, WASHCOs, other community based organizations specially working on child survival, agricultural extension agents, NGO home-visitors will expand and follow household and community outreach.

SC 3 Capacity building
Program will use cascade training methods to master trainers at regional level and implementers training at woreda, Kebele and village levels to all sector actors such as Environmental Health workers, Health Officers, Health

Extension workers, Health Extension Program supervisors, WASHCOs, Health development army and other Primary Health Care staffs at the PHCUs and community resource people..

SC 4: Media Support

While access to listening to radios is by no means universal or equally accessible to all family members, a radio is the best medium for wide reach into communities and households especially in the Ethiopian context where TV is not widely used in rural communities. Various programming, from public announcements to radio dramas/theatre to games and contests can provide credibility, popularity and support to more intensive community and household behaior change efforts. They magnify impact and increase the number of contacts with householders, a factor known to catalyse change. Equally useful nowadays is the mobile phone which is a source of information and that which can be a medium for sanitation, water and hygiene behave our change promotion.

SC 5 Behaior Change Communication Strategy

The Communication and Messaging Strategy will make practicing WASH behaiors seem "fun, easy and popular", and 'promise" benefits that are appreciated by most households. However, a well-designed methods and tools will be necessary for effectiveness *(see number 8 below for details*).

SC 6: Increasing Availability and Affordability of Hygiene and Sanitation Products through Private Sector Initiative

The strategy must not only build demand for products, but support the private sector provide (supply) of affordable quality products. As gaps in key products are identified through regional, woreda, and household "analysis", the behaior change strategy then responds by identifying or if necessary, by building public and private sector networks to provide affordable access.

SC 7: Demonstration Latrines, Hand Washing Stations, and other Hygiene-related products.

Creating model" showrooms" of hygiene and sanitation products allows people to see, touch and try hygiene, safe water, and sanitation products. They can actually try various options, and understand the related costs, benefits, and upkeep.

6. Key Critical Success factors (Barrier Analysis)

Table A5-1: Hygiene and Sanitation/Environmental Health Behavior analysis

Existing H and EH Behavior	Feasible or do-able-behavior	Ideal behavior
1. Human Excreta Management		
Many people still defecate in the open	♦ People can use simple methods (cat method) and cover their feces to prevent any access by flies and animals	♦ Everyone in a community use an improved latrine which is cleanable and that which lasts longer, protect the users from disease provide adequate privacy and
Most of the existing Latrines are unimproved, not providing adequate privacy	♦ Even if people can't construct improved latrine with slabs or concrete available latrines can be transformed to have the features of an improved type with local materials	
People in urban and rural communities don't dispose child feces properly	♦ People can help child defecate on leaves, paper, broken clay and dispose it in latrine or cover it with soil to deny fly access.	
Those who own and use latrine don't keep their latrine clean, cover squat holes and maintain it regularly	• Latrine floors can be made with dung or mud to make it smooth and cleanable and • latrine squat holes can be covered with any available discarded household materials • Pot makers in the community can easily shape clay cover for squat holes	
Latrine is not considered part of the living house	• Households can use their house building skill to also construct proper latrine • Housewives and children can make the latrine floor, walls etc. cleanable and comfortable using local materials that will not cost them money but only their time.	• Latrine floor and walls can be constructed from durable materials such as cement, brick or blocks and covered with tin sheet
2. Hand Washing practice		
People who own latrines have no hand Washing facility arrangement by the latrine and if they have it has no water and if there is water there is no soap or substitute.	• Compared with latrine construction tasks hand Washing arrangement is so simple and cheaper to be motivated	• Hand Washing facility with running water and soap or soap substitute or soap dispenser available ideally by the toilet and kitchen
People don't practice proper hand Washing even if they have the facility and water	• People can be made aware about the critical moments and encouraged to WASH their hand with soap or ash	
3. Solid and Liquid Waste Management		
The immediate housing environment in communities are littered with animal waste	• People has to be encouraged to do daily cleaning,	

Existing H and EH Behavior	Feasible or do-able-behavior	Ideal behavior
(dung and urine), farm (crop chaffs) and other solid waste	• Practice proper storage that discourage fly breeding or other animals harborage • use the organic wastes such as house sweepings and dung waste for composting, land reclamation, soil conditioning or plastering of walls and floors.	• Use cow dung together with human feces for biogas production • Compost all organic waste and use it for soil conditioning.
Liquid waste from cloth Washing, food utensil Washing, bathing, animal urine are indiscriminately thrown outside the house	• People should be made aware of the health effects of such wastes and encouraged to dispose in a seepage pit or use the waste water to water plants	
4. Water safety measures		
People are still using an unprotected water source	• Water boiling is a simple and cheap method of making water safe for drinking • Use water guard which is simple to use, accessible and affordable	• All people rural/urban use improved water source in at least at intermediate access level
Water transport, storage containers and water drawing utensils are largely unclean	• Water container should be cleaned every time when water is fetched or whenever water is finished from storage	
People don't practice Point of Use treatment for water	• Chlorine solutions such as wuha agar which is available in local pharmacies and affordable can be used for disinfection	

Table A5-2 Stakeholders Analysis Important for Community Center Programming

Stakeholders	What we expect from Stakeholders	Stakeholders expectation
1.Private sectors	• Their involvement in sanitation marketing • Robust plan to reach out to rural communities with appropriate water treatment methods • Participate in demand creation for sanitation and water quality improvement	Government initiate to lead the development and to take responsibilities in organizing and facilitating financial inputs.
2.Faith based/religious organizations	• Their understanding and commitment to support hygiene and sanitation changes as stated in the scriptures. • Guide their followers according to the scriptures by organizing the communities towards achieving a clean and health environment. • Act as change agents in their communities	• Capacity building on prescribed sanitation and hygiene facts in the bible and Koran. • Introduce construction skills in latrine construction
3.NGOs	NGOs who are frontline community supporters are expected to be part of: • Community mobilization process.	• Aligned plan • Receive inputs

Stakeholders	What we expect from Stakeholders	Stakeholders expectation
	• Follow government approved strategies and directions • Adopt designed tools • Be part of the monitoring and evaluation process in the communities	• Motivation and feedback
4.Micro and small enterprise development agencies, micro finances at federal, regional and woreda levels	• Organizing private sectors to take up sanitation and hygiene as a business. • Rendering capacity building to newly established sanitation business private sectors • Support in making available the much-needed seed money and necessary tools to the private sectors • Align their plans with sectors	• Consultation • Support to facilitate capacity building efforts • Expert support • Guarantee for financial repayment
5.Community members	• Community participation in the change process • Trust, involvement, cooperation, attitudinal change • Cooperation in allocating their time, local resources and skill for sanitation and hygiene improvement.	• Capacity building • Regular follow up and encouragement • Technical support
6.Teachers	• School teachers being the most educated members of a community should lead and support the hygiene and sanitation behavior change process, • take active part in involving school children in promoting improved sanitation in their households and immediate neighbor. • Enhance and support the construction of improved latrines and support efforts for ODF achievement in their communities • Create a positive public image by transforming the school environment	• Recognize their importance as change agents in their settings • Capacity building • Follow up support • Printed materials such as guides and manuals
7.School children and parents	• Agree that School children are the future generation. • Behavior changed at this stage will be sustained for life. • Cooperate to involve for a rapid behavior change in their households and neighborhood.	• Capacity building in Hygiene and sanitation • Hands-on training on latrine construction • Support their community mobilization effort • Introduce simple child friendly behavior change communication methods such as dramas, skit
8.Women organizations	• Understanding the fact that Behavior transformation starts at household level.	• Involvement in initial intervention program

Stakeholders	What we expect from Stakeholders	Stakeholders expectation
	• Awareness creation that children and women are the most vulnerable and most exposed to adverse sanitation and hygiene related adverse effects • support women empowerment and make them part of the solution • mobilizing Women for behavior change • awareness creation to take lead in promoting positive sanitation and hygiene behaviors.	• Invitation to workshops, • participating in campaigns • Training
9.Community level organizations such as Idir, development team (limat budin)	• Understand that Empowering and enhancing community involvement will support rapid changes in sanitation and hygiene behaviors. • Create awareness for communities to believe in themselves and enhance their self-esteem. • Follow up progress and support efforts by households and community members	• Hands on Training • Motivation and feedback

Areas of Focus in Sanitation and Hygiene in communities

Risk evaluation studies and critical factor analysis (Table 1above) made by national and other researchers using qualitative study (community dialogue, environmental surveys and Focus Group Discussion and literature review on five environmental health domains which include water, sanitation and hygiene, indicate risky behaviors in all domains.

Rural and pastoralist sanitation: The effort rendered by Health Extension Workers have resulted in gaining substantial change especially in un improved sanitation in rural agrarian regions but not so in pastoralist regions. However, improved sanitation is still low and ODF attained is not sustained. The didactic method of communication by health extension workers should be strengthened through the enhancement of community empowerment. (see Box 1)

Just as with adult sanitation, safe disposal of children's feces should ensure separation of the stool from human contact and an uncontaminated household environment. Although some people think that children's feces are less harmful than adults', this is untrue. Due to higher prevalence of diarrhoea and pathogen counts (e.g. for entero viruses, hepatitis A, rotavirus, E-coli, shigella, vibrio cholerae) and other tropical diseases such as soil transmitted helminthes (STH) child stool often poses a greater health risk than adults'.[83] A 2010 study on child faeces disposal conditions in Ethiopia found that 69% reported that the faeces of their youngest child under three were not deposited into a toilet/latrine – i.e. that the child feces were unsafely disposed. Also poorer households rural, and those without improved sanitation or any type of sanitation system – consistently reported higher rates of unsafe child feces disposal.

Urban sanitation: The present urban and small-town sanitation conditions in Ethiopia are very alarming. Solid waste is disposed anywhere as long as it is out of site; liquid waste of any kind (domestic, industrial, institutional, flood etc), and human excreta are dumped to pollute the rivers, the land and the atmosphere through the rots and methane gas that is produced in the pile. If there was a recycling program the waste produced in urban areas would have been economically viable.

Globally, the great majority of urban dwellers, especially poor people, rely on non-sewered systems that generate a mix of solid and liquid wastes generally termed "fecal sludge." In poor and rapidly expanding cities, fecal sludge management (FSM) represents a growing challenge, generating significant negative public health and environmental risks.

Most sanitation facilities (about 91%) in Addis Ababa are onsite sanitation that requires pit emptying services. Nevertheless, 85.4% of the residents are dissatisfied with the pit emptying services. As a result of the severe constraints of pit emptying and FSM services, most toilet facilities (about 50%) were full.The general situations in small and big cities require a pragmatic and sustained approach for solid and liquid waste management and enforcement. [84].

Water Quality: Water quality monitoring is an essential environmental Health program aiming at Preventing water borne diseases such as diarrhoea. A recent study by EPHI indicate that 43 % of water sources [85] considered improved are contaminated with e coli. Even some samples indicate the contamination of water with lead and

[83]Feachem, R., D Bradley, H Garelick, et al. *Sanitation and Disease: Health Aspects of Excreta and Wastewater Management. World Bank Studies in Water Supply and Sanitation 3*. Chichester, UK: John Wiley & Sons, 1983.

[84] Abebe B. gtafere A et al (2014) Situational analysis of access to improved sanitation in the capital of Ethiopia and the urgency of adopting an Integrated Fecal Sludge management System

[85] EPHI: Water Quality assessment in SNNPR

iron. Although there are few regional lab oratories and partner supported field monitoring kits being used for water quality surveillance, there is a need to strengthen the program at all levels.

Disease Burden: Poor sanitation and unhygienic practices, malnutrition, and acute respiratory infections prevailing in the country are major contributors to ill health and mortality especially of infants and children.

The MDG report (2010)[86] clearly states that 23% of the causes of under-five mortality in Ethiopia is due to diarrhea resulting from poor sanitation and hygiene. The recent Health Sector Transformation Plan (HSTP) [87] also indicated that diarrhea is the second biggest killer for under five children next to acute respiratory infection.

The facts and figures, therefore indicate the need to strengthen the water, sanitation and hygiene program so that healthy, productive and vibrant citizens prevail. In order to take sanitation, hygiene and water safety forward the following strategy which would support the "Community Centerd Approach is designed.

7. Strategic Approaches

a. Establish common ground with WASH member institutions, sector staff, NGOs and others at all level on the need to make the hygiene and environmental health transformation approach a community centered program.

b. Design tools, procedures, manuals and guidelines with all its principles, print and distribute to all kebeles

c. Develop simple, replicable and affordable sanitation and hygiene technology options with steps and pictures to be included in the community manual

d. Conduct capacity building program and create critical mass of trained sector actors at regional, woreda and Kebele level who in turn, train Community Resource People (CRP) who would be recruited from each community.

e. Recruit community action team (CRP) from religious organizations, teaching institutions (teachers and students), women and youth groups to play the roles and and take responsibilities of community mobilization in hygiene and environmental health behavior change process.

f. Establish a monitoring, reporting review, value, learning and knowledge sharing and benchmarking mechanisms.

g. Establish a kebele hygiene and environmental health planning tool and make it a biannual procedure and exercise.

h. Develop IEC materials and BCC tools to promote hygiene and sanitation/environmental health behaior and enhance a continuous and mass public engagement process

i. Capacity building to Health Extension workers and Women Health Development Armies on:

a. **Community dialogue** which is needed to communicate do-able-actions at household level .using job aides. Do-ables are first level actions that are simple but useful and which can be upgraded as community level behavior changes. It also helps to have persistent contacts and dialogue for more simple intervention methods

[86] MDG report (2010), MOH

[87] Health Sector Transformation Plan (HSTP) 2015, MoH publication.

b. **CLTSH and SLTS facilitation skills**: There has never been CLTSH training for HEWs as such except very short training in the integrated Refreshment training which was not adequate. Facilitation of CLTSH demand motivation, skill, tactic and commitment. HEWs are the immediate contact to the communities enabling them to have the skill will be useful and make them independent.

c. **The Planning process** should be a continuous exercise by all sectors especially to start behaior change activities at the community level. Planning will include what, why, when and by whom.

d. **Conducting surveys, analysing data and presentation:** One of the main gaps in the health sectors is the lack of true, reliable and up-to-date data. The sector should establish a monitoring system based on baselines. Sector staff should be able to collect and collate data to have evidences on where to start and what to accomplish.

e. **Reporting:** True report at the right time is useful for planning and evaluation

8. Communication for Social and Behaior Change (SBCC)

Box 2

Behaviour Approximations

1. The white **traditional Ethiopian cloth** now adopted by all tribes is the white cotton dress for male and females. This reflects clean looking appearances to keep their **dignity** in public.
2. Ethiopians have **fly whisks** that they hold at the time of eating because they don't want flies on their food.
3. Ethiopians use different types of sticks for tooth brushing.
4. Ethiopians wants to have at least **their fingers wetted** with water before they eat and use soap after eating than before.
5. Ethiopian women use **ash to clean greasy cooking** utensils, or that which is contaminated with smelly staff such as gasoline or kerosene
6. In Ethiopia Muslims especially after they have made themselves ready for salat will not shake hands fearing that **peoples hand can be contaminated with anything including fecal matter.**
7. Ethiopians clean their house and compound and burn all trash once a year on November (HIDAR 12).
8. Ethiopians know the benefits of organic waste. They want families to defecate or dump ash on their farms especially the backyards which is usually reserved for vegetable farming.

Behaior change and practice for sanitation and hygiene may become more productive if it is based on knowledge on key aspects of what people KNOW, DO AND WANT. Starting with positive aspect of hygiene is much preferable than to use the germ theory and disease. Would our result change if we include behavior approximations (see box 1) that are cultural in Ethiopia? Basing our behavior change approach on the existing approximate behavior that are cultural norms and qualifying it further may be an easy means of discussing the ***issue than tell people what to do as if they don't know about it.*** For example, telling people to WASH their hand before eating is not new for Ethiopians because it is a cultural practice to WASH hands before eating although not proper. Some of the pertinent approximate behaviors for Ethiopia are listed in box 2.

Table 5. Strategic Objectives and Strategic Action Plan and Time Line to Enhance sustainable behavior change in WASH

Objectives	Responsibility	When	Resources (material, human, financial)
Strategic Objectives 1: Introduce the community Centerd approach to 100% of all concerned Federal, Regional, Woreda and kebele level leaders, other stakeholders and partners by December 2019.			
Task 1.1 Introduce the new approach to Regional and zonal staff, local NGOs and other stakeholders and partners	NWCO, RWCO, RPMUs	September 2018	• Stationary • Venue rent • Transport and • Perdiem
Task 1.2 Introduce the new approach to all WWT members, PHCU and kebele leaders and agree on the composition.	1. Regional WCO 2. RPMUs 3. ZPMUs 4. Partners-NGOs	September 2018	• Stationary • Venue rent • Transport and • Per diem
Strategic Objective 2: Establish Community Centered Program in 50% of communities in Ethiopia by 2020.			
Task 2.1 Training of trainers to selected sector staff to create a critical mass of trained sector staff and partners at woreda level	1. Regional WCO 2. RPMUs 3. ZPMUs 4. Partners-NGOs	October-2018	• Stationary • Venue rent • Transport and • Per diem
Task 2.2 Recruit CRP members from each community	1. WWT members, 2. Kebele leaders 3. Health Extension Workers 4. Primary Health care unit staff	November 2018	• Transport and • Per diem
Task 2.3 Train Community Resource people on the merits of the new approach, roles and responsibilities, the religious doctrines on sanitation and hygiene,	1. WWT members Woreda HEP supervisors 2. PHCU staff 3. HEWs	December 2018 to - May 2019	• Printed Pictorial job aides, training materials and Guides
Task 2.4 Introduce action planning templates	1.WWT Kebele leaders 2. Woreda HEP supervisors 3. PHCU 4. HEWs	December 2018	• Stationary
Task 2.5 Construct a model demonstration latrine, hand Washing device and a model house in each community	1. Kebele leaders 2. CRP 3. WHDA 4. HEWs 5. PHCU	January to February 2019	• Hand tools/digging equipment • Stone, wood, mud/dung
Strategic Objective 3: Increase awareness, knowledge for attitudinal change to 70% of the population in Ethiopia by 2020.			
Task 3.1 Mobilize all community members through CLTSH triggering	1. 1.Woreda HEP supervisors 2. PHCU 3. 3. HEWs	February to March2019	• Printed Pictorial job-aides training materials and guides
Task 3.2 Mobilize all schools through SLTSH triggering tool	1.Woreda HEP supervisors 2. PHCU 3. HEWs	February to March 2019	• Printed Pictorial jobaides training materials and guides

Objectives	Responsibility	When	Resources (material, human, financial)
Strategic Objective 4: Increase the availability and consistent use of improved latrine to 82% by the end of 2020.			
Task 4.1 Organize a community action to support improved latrine construction including from the old, persons with disability and poor households.	1. Community members led by CRP 2. HEP supervisors 3. PHCU staff 4. HEWs 5. WHDA	January 2019 to June 2010	♦ Labor cost ♦ local materials ♦ Nails ♦ Wood
Task 4.2 Follow up on to strengthen: ▪ Behavior change and practice ▪ proper utilization of the latrines Proper cleanliness and maintenance of the latrine	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	J January 2019 to June 2010uly	♦
Strategic Objective 5:Increase the number of households practicing hand Washing with soap at all critical moments by 77% by the end of 2020.			
Task 5.1 The importance of Washing hands at all critical times will be the first task for the trained community resource people (CRP) to communicate	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	January 2019 to June 2010	♦
Task 5.2 Promotion of hand Washing containers and how to make them easily using local materials will be one of the important activities at household level.	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	January 2019 to June 2020	♦
Task 5.3 installation of hand Washing container with water and soap or substitute is part of the Improved latrine construction program**.**	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	JJanuary2019 to June 2020	♦
Task 5.4 Regular follow up using check list including proxy indicators, availability of water in the container, availability of hand cleansing agent by the water container.	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	January 2019 to June 2020	♦
Strategic Objective 6: Establish sanitation marketing private sectors providing improved and affordable sanitation options in at least 50% of woredas by 2020			
Task 6.1 CRPs and others continue to create demand for sanitation options	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	January 2019 to June 2020	♦
Task 6.2 cooperate with private sectors in promoting available technology options, negotiate and registering individuals buyers	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	January 2019 to June 2020	♦
Strategic Objective 7: Reduce feco-oral disease transmission through the promotion of hygiene and sanitation behavior change in 100% of communities in Ethiopia by 2020.			

Objectives	Responsibility	When	Resources (material, human, financial)
Task 7.1 Conduct behavior change program through household outreach through the introduction of do-able actions that are within the household limit (skill, economy etc)	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	January2019 to June 2020	♦
Promote safe water handling, storage and use through use of point of use water treatment,	PHCU staff 2. CRP 3. HEWs 4. WHDA	January 2019 to June 2020	♦
Task 7.2 Facilitate mass campaigns, shows, benchmarking that helps to motivate households change to a better behavior**.**	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	January 2019 to June 2020	♦
Task 7.3 Distribute leaflets, posters, banners and other communication materials	1. PHCU staff 2. CRP 3. HEWs 4. WHDA	January2019 to June 2020	♦

9. Source of Funds

Community centerd hygiene and environmental sanitation/health program did not require direct funding other than what is allocated for rural and urban programs. The reasons are:

a. The community centerd program is a program where households in communities are mobilized to decide on their own to change the hygiene and environmental conditions for a lasting healthful living.

b. The people that are directly involved in community mobilization process are:
   - Community Resource People (CRP) which includes religious leaders, teachers, students, women health development army, women and youth group who are permanent residents of the community which are not paid.

   - Frontline health staff from Primary Health Care Unit, Health Extension workers, kebele political leaders at kebele level and Woreda WASH Team members at woreda level are paid by government to support the Community Centerd Program (CRP)

c. Funding may be necessary to cover the cost for capacity building, community triggering, mass BCC campaign, printing of IEC materials, such as posters, stickers, banners, purchasing air time for radio shows etc. The source of fund for these software activities are:
   - Government allocation
   - Partner organizations who supports the program but who are not directly contributing to the One WASH National program.
   - Consolidated WASH Account.
   - NGOs operating in the specific areas within the regions could also support.

Annex 5: OWNP Result Framework-2018-2020

Table A5-1: Results Framework

Parameter	Outcome	Indicator
Outcome	• serve 85% of the total rural population with access to 25 l/c/d water supply source within a distance of 1 km from the delivery point (20.4 million more rural people will need to be served) • Decrease RWS Non-Functionality rate of water supply system from 11.2% to 7% • serve 75% of the total urban population (5.7 million more urban people will need to be served) from 40l/c/d for category 5 towns to 100l/c/d to category 1 towns/cities • Decrease Non-Revenue Water for urban communities from the 39% to 20% for UWS utilities of category 1-3 • increase use of improved latrine from the present 28% to 82% In rural areas • Increase proportion of ODF communities In kebeles from 18 to 82% • increase hand Washing with soap and water households from 17% to 82% • Improve full package WASH access from the present 3.2% to at least 40% of schools including MHM • 100% of health facilities with full package of WASH facilities including MHM facilities 100% • Increase proportion of households using correct and consistent water treatment and safe storage from 10 to 35%	• % of population with access to 25 l/c/d water supply source within 1 km radius for rural • Percent of Non-Functionality Rate • % of population with access from 40l/c/d for category 5 towns to 100l/c/d to category 1 towns/cities in urban areas • Number of UWS utilities of category 1-3 that decrease Non-Revenue Water • % of rural and urban population with improved latrine • % of rural population with ODF • % of households hand Washing with soap and water • % of schools and health institution with access to full package of WASH • % of health facilities with full package of WASH services • % of households practicing point of use (POU) water treatment
Outputs 1) Improved water supply increased in rural, pastoralist and urban areas,	**Rural and Pastoralist WASH**	
	49, 877 water supply schemes constructed [2,987 conventional and of 46, 890 non-conventional:4,366 self-supply and 42,524 on spot]	Number of water supply schemes constructed, as % of target
	5,871 water schemes rehabilitated Improved functionality of water supplies	Number of water supply systems rehabilitated, as % of target
		% increase in functionality of rural water supplies
	Urban WASH	
	1,256 feasibility study and design reports prepared	Number of feasibility study and design reports prepared/approved
	280 new water supply system constructed for category 4 and category 5 towns **976** water supply systems rehabilitated/expanded	Number of new urban water supply systems constructed for Category 4 and category 5 towns Number of urban water supply systems extended and or rehabilitated for all category of towns
2) Improved WASH facility with full	**Institutional WASH**	

Parameter	Outcome	Indicator
package for institution	**17,874**WASH facilities with full minimum package (Safe water system, Latrine construction and MHM facilities with hygiene promotion and training on WASH facility management and O&M) provided in schools	Number and % of schools having access to WASH facility with full minimum packages
	8, 306 WASH facilities with full minimum (Inclusion safe water system and Latrine construction with hygiene promotion and training on WASH facility management and O&M) provided in health institution	Number and % of health institution having access to WASH facility with full minimum packages
2) Sanitation access and hygienic practices increased in rural, pastoralist, and urban areas	**Rural and Pastoralist WASH**	
	improved sanitation facilities constructed	Number of improved latrines constructed Sanitation coverage in communities where CLTSH is launched
	ODF kebeles increased	Number and % of ODF kebeles
	Sanitation marketing introduced	No. of sanitation markets established
	% of HHs practicing hand Washing with soap at critical times increased	% of HHs practicing hand Washing with soap at critical times
	Household water treatment and safe storage promoted	Number and % of households practicing safe water treatment and storage
	Unimproved latrines upgraded to improved latrines	No. and % of HH latrines upgraded in rural areas
	Urban WASH	
	1201 Public Toilets Constructed in 973 towns	Number (%) of public latrine built in --#of towns
	2237 Communal latrine Constructed in 973 towns	Number (%) of communal latrines built---#of towns
	1946 School Toilets Constructed two per each town in 973 towns	Number(%) of school toilet constructed in --# of towns
	100% Communal and Public Latrine rehabilitated in all regional/town administration level	Number (%) of rehabilitated public and communal latrines constructedin --# of regions
	48 Procurement of 8 m3 capacity Vacuum Trucks for 50 towns and surrounding cities	Number (%) of vacuum track supplied
	25 Procurement of 5 m3 capacity Vacuum Trucks for 50 towns and surrounding cities	
	1 Procurement of 3 m3 capacity Vacuum Trucks for 50 towns and surrounding cities	
	Procurement of 184 pumps and 97 Generator for waste water management system for Addis Ababa town	Number (%) of pump and Generator supplied and installed
	100% of Study, Design and Construction of wastewater management for Addis Ababa	Number (%) of wastewater/septage systems constructed
	100% Study, Design and Construction of wastewater management for 22 towns	Number (%) r of wastewater/septage systems design prepared and constructed
	Feasibility study and design for wastewater management for 14 towns	No. of feasibility studies and designs prepared
3) Enabling environment and	WASHCOs have legal status	Number and % of WASHCOs with legal status
	WASHCOs and Water Boards have 50% women members	% of WASHCO and Water Boards with 50% women members

Parameter	Outcome	Indicator
good governance in the WASH sector	Geographical equity increased	% of woreda/regions geographical equity within acceptable limits
	-- Program launch workshops held	Number of Program launch workshops held
	CSOs and emergency programs reporting to WASH structure on their plan, budgets, reports on expenditure and costs	Number % of CSOs/NGOs and emergency programs reporting to WASH structures on their WASH plans, budgets, costs and expenditure
	WASHCO, woreda, zonal RWCO, NWCO and federal staff trained in data collection and database management (WASH MIS, HMIS and EMIS)	Number of staff trained in data collection, database management, (WASH MIS, HMIS and EMIS) and reporting formats
	WASH data collected/analyzed using key performance indicators/NWI updated	% of standardized WASH data collection/analyzed using key performance indicators
	KWT, WWT, RWCO and NWCO prepare consolidated WASH progress reports monthly, quarterly and annually	% of consolidated reports prepared at all levels on a regular basis
	WASH review meetings held quarterly at all levels as per the WIF recommendations, including JSR and MSF, followed up	Number and % of quarterly WASH review meetings held by level JTR and MSF meetings held annually and biannually, respectively
	Technical and financial audits carried out	Number of technical and financial audits carried out/year
	No- functionality rate of Rural water scheme reduced to from 11.2% to 7%	% of non-functional rural water supply schemes
	Non-Revenue of water of all towns in all regions reduced from 39% to 20%	% of non-revenue water
	Category 1 to category III of towns reached 80% of full cost recovery, Category IV towns reached 60% and category V towns reached 50% and all towns cover 100% O&M	% of full cost recovery % of O&M recovery
	100% water safety plan prepared and monitored for at least category 1,2 and 3 towns	% of water safety plan prepared
	100% Establish groundwater monitoring and catchment protection system around water supply sources implemented by Urban Water Supply Utilities	% established groundwater monitoring
4) Efficient use of resources	Capacity in groundwater knowledge and siting strengthened	% successful BHs/wells
		% reduction in drilling unit cost
	Sub-regional operation and maintenance units and supply chain outlets established	% increase in functioning rate of water supply systems in rural areas
		% of TWU supplying water more than 16 hours a day to all customers for category 1 ,2 and 3
	Per capita cost for urban water supply: Category 1 USD 319 Category 2 USD 74, Category 3 USD59, Category 4 USD 95, Category 5 USD 136 and for rural water supply per capita cost USD 89, USD 74 and USD 85 for self-supply, Spot supply and Piped Water supply respectively.	% reduction in per capita investment costs in town, cities and rural areas
	Per capita cost for urban sanitation: USD 342 for AAWSA, USD 162 for other towns and for rural sanitation USD 19.	
	Monitoring data analyzed and used in decision-making	
	Pilot/demonstration activities documented and scaled up	No. and type of pilot/demonstration activities scaled up
	Water supply in drought-prone areas prioritized to reduce water delivery by tanker	% reduction in water delivery by tankers

Parameter	Outcome	Indicator
5) Strengthened capacity of WASH sector actors for achieving and sustaining results	Woreda/zonal/regional staff trained in:	No. of trainees by gender
	2,655 High Level Professionals trained (600 water engineer, 240 geologist, 420 hydro-geologist, 75 hydrologist, 510 electromechanical engineer, 420 sociologist, 90 economist, 150 chemist and 150 biologists	
	7,800 Medium Level Professionals trained (4,050 water supply technicians, 3,390 E&M technicians and 360 drillers)	
	6,300 artisans and 320,000 caretakers	
	Standard bidding/contract management/supervision documents prepared	No. of manuals for tendering, contract management and supervision
	75 TVETCs/HSCs supported to offer WASH courses	No. (%) TVETCs and HSCs offering relevant WASH courses/No. of graduates
	11 women and youth-led entrepreneur groups established and linked to suppliers	No. and % increase women and youth-led suppliers of WASH products and services
	280 post-construction support units established/functioning for category 4 and 5 towns	% of post-construction support units established and functioning
	Health clubs established in schools	% of schools with active WASH/health clubs
	Water Boards established in Category III towns; capacity of TWBs in business planning, asset management, planning, monitoring operators, oversight of Program implementation, strengthened.	No. of category III towns establishing Water Boards No. (%) of TWBs in category I & II towns with adequate capacity to fulfill their roles in urban water supply
	TWUs trained in routine O&M, asset and financial management, customer relations, reducing UAW, etc.	% of TWU recovering full costs % of TWU recovering O&M and replacement cost
	1000 Vehicles and 74 vacuum trucks/carts, tool sets, office equipment, water quality testing equipment procured	No. of vehicles, vacuum trucks/carts, tool sets, office equipment, water quality equipment, etc. procured and distributed
	11 water quality laboratories supported at regional level	No. (%) water quality laboratories supported and operational
	Trained personnel in water and wastewater quality testing	% of water quality tests meeting Ethiopian water quality guidelines and discharge from wastewater treatment plant meeting WHO guidelines for agriculture use.

Annex 6: Low-cost Fecal sludge management in Ethiopia

Examples of Improvements in Liquid Waste Management in Bure Towns Amhara Region (Water Aid Ethiopia)

Urban sanitation (solid and liquid waste management) is a relatively recently included component in the 20 towns project, and WAE has supported this in various ways. Consultants were provided to undertake solid waste management surveys in each of the towns, allowing (often first-time) data to be availed on waste generation rates, compositions, coverage of collection services, etc.

For liquid waste, training was provided (to utilities, health department and municipality staff) by Leeds University (UK) on the 'Shit. The following pictures shows low-cost FSM uses of suction tri cycle for emptying in the congested and urban pro poor area piloted in selected 20 towns projects. It is cost effective the service capacity for a single emptying volume of septic is not more than $3m^3$ whereas the vacuum suction truck service provided by the town administration is $8m^3$ which is not affordable for low income community.

Septic Tank Suction Tri-Cycle picture on duty in Bure Town

The picture shows under emptying service in Bure Town residence house

Examples of Improvements in Solid Waste Management in Finote Selam and Adigrat

In Finote Selam waste collection used to be undertaken only for households that directly paid the MSEs for collection services. This meant that only the better off paid, the system lacked economies of scale, thus increasing the cost for the customer, and collection rates were low across the town. Following the WAE supported study and training, the town administration and other stakeholders have made key changes to the SWM system.

Now all households in the town are charged a flat fee of ETB 20(around GBP £0.66) per month for waste collection. The water utility has provided then MSE's with office space in their compound, so that when customers come to pay their monthly water bill, they also pay their waste collection bill. This has led to considerable increases in revenue streams for waste management in the town.

Waste collection coverage has raised to 96%, and collection is now every two days, bringing major improvements in environmental health, and also satisfaction of the town's residents. Employees of the MSEs are generally students and/or from vulnerable households. The number of employees of the MSEs has increased considerably, and their income has doubled. In Adigrat, the town's MSEs involved in waste management has 65 members, 75% of which are female.

The MSE's have been allocated space in the landfill for waste segregation, composting and recycling, with the revenues from sales adding to the income from the customers they collect from. The town administration and Health Department have also collaborated on 'healthy home' initiatives, with competitions for the cleanest homestead. Domestic level composting of organic waste is being demonstrated in 'model homes' across the town. Adigrat has recently won an award for the cleanest town in the Tigray Region.

Solid waste dump tricycle truck on duty in Fenote selam Town

Low cost recycles Biogas pilot project to be scale up already piloted by SNV – Transforming the lives of families in rural Ethiopia

Technical overview of SNV household biodigester

The SNV household biodigester needs at least four heads of cattle, stabled during the night, to get at least 20kg of fresh dung per day, for adequate cooking and lightning energy. Liquid input in 1:1 ratio with dung is needed for biogas production. Liquid can be either water or urine. There are many areas in case study countries, especially in Ethiopia, where this amount of excess water is not available. (Encyclopædia Britannica, Laos, 2011)

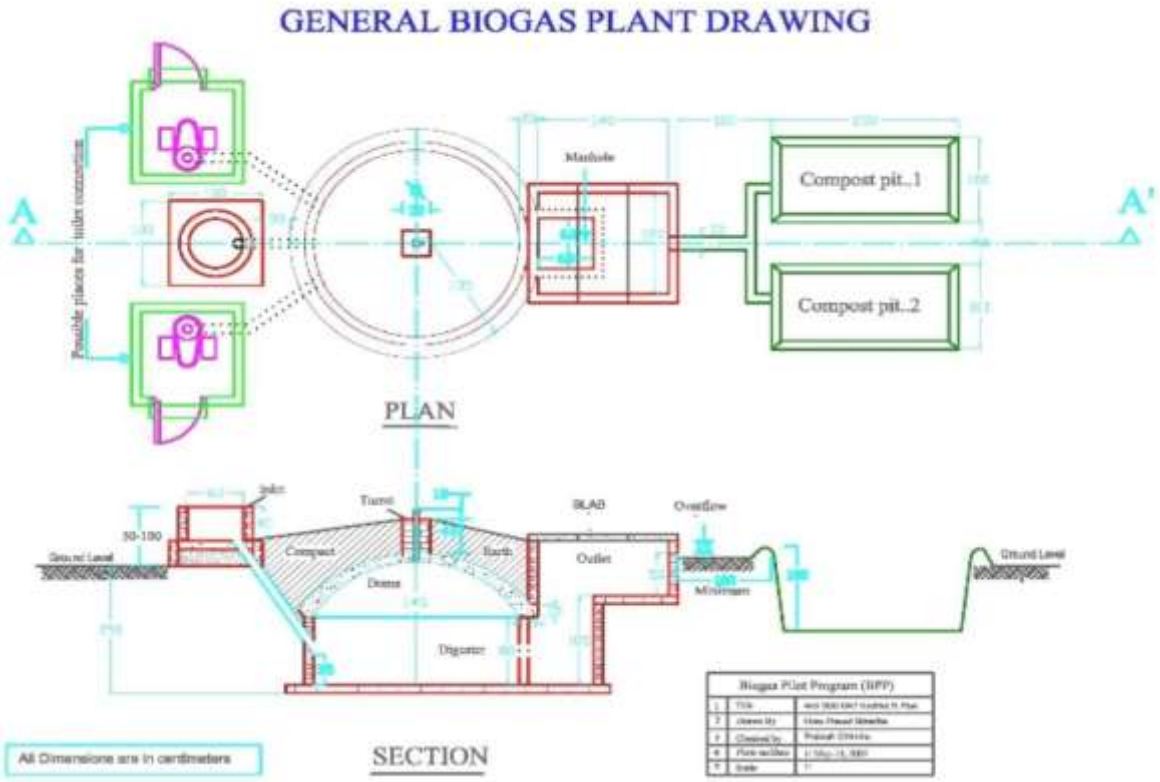
Biodigester as fuel

According to a survey made for the NBP in target provinces most households owns cows, 41% own pigs and 17,3% own buffalos. In average, the rural households own 8,33 animals, which produce enough dung to operate a biogas digester. According to NBP, production of at least 20 kg of dung on daily basis is the minimum requirement of bio-digester operation. For example, two cows and five pigs would provide enough dung to operate a small plant. (UNDP, 2004; NBP Cambodia, 2009 b) The plants come in four different sizes: 4, 6, 8 and 10 cubic meters. The required daily inputs are presented in the following table:

Daily required input, gas production and fuel wood equivalent per plant volume. (Source: NBP Cambodia, 2009 b)

Biodigester size	Daily dung feeding (kg)	Daily gas production (m3)	Use of Biogas Stove (hour)	Use if Biogas Lamp (hour)	Fuel wood replacement value (kg)*
4	20 to 40	0.8 to 1.6	3.5 to 4	8-10	4 to 8
6	40 to 60	1.6 to 2.4	5.5 to 6	12-15	8 to 12
8	60 to 80	2.4 to 3.2	7.5 to 8	16-20	12 to 16
10	80 to 100	3.2 to 4.0	9.5 to 10	21-25	16 to 20

Note: * Based on a commonly used, low tech, woodstove with a 10% efficiency rate. 1 m^3 biogas will replace about 5kg of fuel wood.


GENERAL BIOGAS PLANT DRAWING
Compost pit..1
Compost pit..2
A
A'
PLAN
SECTION
All Dimensions are in centimeters

Annex 7: WASH sector reform example

transition from existing implementation routes as described in the Phase I OWNP and modalities as described in **Sub-section 4.1.2** (rural) and **4.3.2** (urban) and can be used to strengthen such routes (for instance, the WRDF). By way of example, a possible new implementation and operational modality to include urban WASH and MVWS schemes may be tentatively illustrated, for initial discussion purposes, by **Figure A8-1** below (for illustrative purposes only – not an official government proposal).

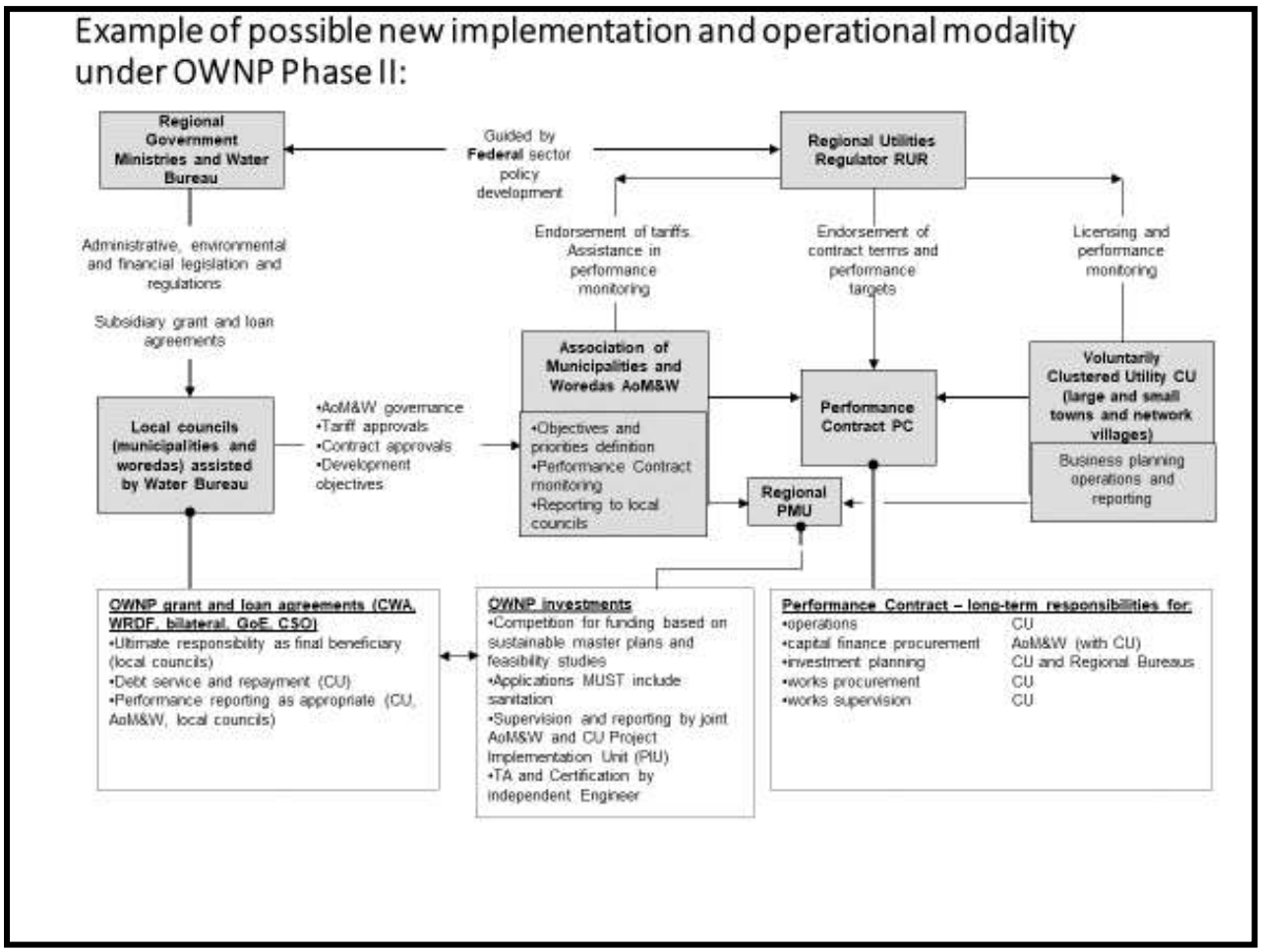


Figure A8-1: Example of possible new implementation and operational modality to include urban WASH and MVWS schemes *(based on voluntarily implemented model first introduced in Romania 2005 and currently serving over 50% of the country*)

Annex 8: Rural technology mix

Table A 3, 29: Recommendation/Remark on each technology mix

No	Technology Type	Recommendation/Remark
1	Household dug well with rope pump	• It appears that, in practice, the unit rates used in the OWNP 2013 document were too low, due to the low number of people served • Averages of the reported figure for other sources, although limited, should be used • This is self-help and therefore does affect the overall budgeting
2	Community dug well with rope pump	• As can be seen in the Annex there is a wide variation in reported values and that are too few data points • It is therefore recommended to use the OWNP 2013 rates until better information is available and apply inflation factors in final budgets • This is self-help and therefore does affect the overall budgeting
3	Dug well with hand pump	• There is sufficient information from the various sources to be able to use the "average excluding OWNP 2013" • There is reasonable correlation with OWNP 2013 figures, but actual costs appear to be lower overall
4	Shallow well with hand pump	It can be seen that there is reasonable correlation between the averages of figures from various sources and the OWNP 2013, except for high figures used by regional plans and CWA in Somali and SNNPR which should be ignored in budgeting work (See annex …)
5	Borehole with distribution (small on spot)	The UNICEF supported project data would appear to be reliable and consistent for this technology type region by region across the country.
6	Capped spring	• There is reasonable agreement between figures from various sources and the OWNP 2013 figures • Except for regional plan figure for Harari and COWASH figure for Amhara; unless good reason can be found then these figures should be rejected as untypical for overall budgeting use (see Annex…)
7	Rain water harvesting	There is insufficient data but there are indications that the OWNP 2013 figures were reasonable and appropriate for use
8	Cistern	There is insufficient data from various sources to make any comment The OWNP 2013 figures should therefore be used
9	Hafir Dam	• There is insufficient data from various sources to make any comment • The OWNO 2013 figures should therefore be used • However, the rates for Somali need to re confirmed: in the meanwhile use averages for Somali as a cautionary approach
10	Single village from spring source + gravity distribution with 2-4 water points (small)	• The data from various sources appears to be reasonable and appropriately ranged across the regions and the averages could be used in preference to the OWNP 2013 figures for overall budgeting purposes • These figures are significantly lower that the OWNP 2013 figures

No	Technology Type	Recommendation/Remark
		• Additionally, the high population per technology figures used by OWNP 2013 for Tigray, Amhara, SNNPR and Oromiya do not appear to have not been verified in practice
11	Single village from spring source + motorised distribution with 2 water points (small)	• The UNICEF supported project data would appear to be more reliable and consistent for this technology type region by region across the country, and are therefore recommended for use for overall budgeting purposes • However, this results in a 4-fold increase in rates compared to the OWNP 2013 figures
12	Multi village from spring source + gravity distribution with 4-6 water points (medium)	The UNICEF supported project data would appear to be representative (for instance high unit rates for Somali and Afar) and should therefore be used until other data becomes available
13	Multi village from spring source + gravity distribution with 6-10 water points (large)	The UNICEF supported project data would appear to be representative (for instance high unit rates for Somali and Afar) and should therefore be used until other data becomes available
14	Multi village from spring source + motorized distribution with 4-6 water points (medium)	• Except for Afar, the UNICEF supported project data would appear to be representative and should therefore be used until other data becomes available • The UNICEF figure for Afar may be based an error or based on a non-typical project. For Afar the SNNPR figure might be appropriate
15	Multi village from spring source + motorized distribution with 6-10 water points (large)	The UNICEF supported project data would appear to be representative (for instance high unit rates for Somali and Afar) and should therefore be used until other data becomes available
16	Single village borehole source + distribution for 4-6 water points	• It can be seen that the regional plans as submitted by B Gumuz, Amhara and Afar include unit rates that are more than double the average values derived from all sources; this offers the opportunity to re-adjust the regional costs downwards. • The UNICEF supported project data would appear to be more reliable and consistent for this technology type region by region across the country (for instance, significantly higher rates for Somali and Afar).
17	Multi village from borehole source with 5-8 km distribution (large)	• It can be seen that the regional plans as submitted show wide variations in unit rates that cannot be relied upon • The UNICEF supported project data would appear to be more reliable and consistent for this technology type region by region across the country (for instance, significantly higher rates for Somali and Afar).

Annex 8: OWNP Result Framework-2018-2020

Table A5-1: Results Framework

Parameter	Outcome	Indicator
Outcome	• serve 85% of the total rural population with access to 25 l/c/d water supply source within a distance of 1 km from the delivery point (20.4 million more rural people will need to be served) • Decrease RWS Non-Functionality rate of water supply system from 11.2% to 7% • serve 75% of the total urban population (5.7 million more urban people will need to be served) from 40l/c/d for category 5 towns to 100l/c/d to category 1 towns/cities • Decrease Non-Revenue Water for urban communities from the 39% to 20% for UWS utilities of category 1-3 • increase use of improved latrine from the present 28% to 82% In rural areas • Increase proportion of ODF communities In kebeles from 18 to 82% • increase hand Washing with soap and water households from 17% to 82% • Improve full package WASH access from the present 3.2% to at least 40% of schools including MHM • 100% of health facilities with full package of WASH facilities including MHM facilities 100% • Increase proportion of households using correct and consistent water treatment and safe storage from 10 to 35%	• % of population with access to 25 l/c/d water supply source within 1 km radius for rural • Percent of Non-Functionality Rate • % of population with access from 40l/c/d for category 5 towns to 100l/c/d to category 1 towns/cities in urban areas • Number of UWS utilities of category 1-3 that decrease Non-Revenue Water • % of rural and urban population with improved latrine • % of rural population with ODF • % of households hand Washing with soap and water • % of schools and health institution with access to full package of WASH • % of health facilities with full package of WASH services • % of households practicing point of use (POU) water treatment
Outputs 1) Improved water supply increased in rural, pastoralist and urban areas,	**Rural and Pastoralist WASH**	
	49, 877 water supply schemes constructed [2,987 conventional and of 46, 890 non-conventional:4,366 self-supply and 42,524 on spot]	Number of water supply schemes constructed, as % of target
	5,871 water schemes rehabilitated	Number of water supply systems rehabilitated, as % of target
	Improved functionality of water supplies	% increase in functionality of rural water supplies
	Urban WASH	
	1,256 feasibility study and design reports prepared	Number of feasibility study and design reports prepared/approved
	280 new water supply system constructed for category 4 and category 5 towns **976** water supply systems rehabilitated/expanded	Number of new urban water supply systems constructed for Category 4 and category 5 towns Number of urban water supply systems extended and or rehabilitated for all category of towns
	Institutional WASH	

Parameter	Outcome	Indicator
2) Improved WASH facility with full package for institution	**17,874**WASH facilities with full minimum package (Safe water system, Latrine construction and MHM facilities with hygiene promotion and training on WASH facility management and O&M) provided in schools	Number and % of schools having access to WASH facility with full minimum packages
	8, 306 WASH facilities with full minimum (Inclusion safe water system and Latrine construction with hygiene promotion and training on WASH facility management and O&M) provided in health institution	Number and % of health institution having access to WASH facility with full minimum packages
2) Sanitation access and hygienic practices increased in rural, pastoralist, and urban areas	**Rural and Pastoralist WASH**	
	improved sanitation facilities constructed	Number of improved latrines constructed Sanitation coverage in communities where CLTSH is launched
	ODF kebeles increased	Number and % of ODF kebeles
	Sanitation marketing introduced	No. of sanitation markets established
	% of HHs practicing hand Washing with soap at critical times increased	% of HHs practicing hand Washing with soap at critical times
	Household water treatment and safe storage promoted	Number and % of households practicing safe water treatment and storage
	Unimproved latrines upgraded to improved latrines	No. and % of HH latrines upgraded in rural areas
	Urban WASH	
	1201 Public Toilets Constructed in 973 towns	Number (%) of public latrine built in --#of towns
	2237 Communal latrine Constructed in 973 towns	Number (%) of communal latrines built---#of towns
	1946 School Toilets Constructed two per each town in 973 towns	Number(%) of school toilet constructed in --# of towns
	100% Communal and Public Latrine rehabilitated in all regional/town administration level	Number (%) of rehabilitated public and communal latrines constructedin --# of regions
	48 Procurement of 8 m3 capacity Vacuum Trucks for 50 towns and surrounding cities	Number (%) of vacuum track supplied
	25 Procurement of 5 m3 capacity Vacuum Trucks for 50 towns and surrounding cities	
	1 Procurement of 3 m3 capacity Vacuum Trucks for 50 towns and surrounding cities	
	Procurement of 184 pumps and 97 Generator for waste water management system for Addis Ababa town	Number (%) of pump and Generator supplied and installed
	100% of Study, Design and Construction of wastewater management for Addis Ababa	Number (%) of wastewater/septage systems constructed
	100% Study, Design and Construction of wastewater management for 22 towns	Number (%) r of wastewater/septage systems design prepared and constructed
	Feasibility study and design for wastewater management for 14 towns	No. of feasibility studies and designs prepared
3) Enabling environment and	WASHCOs have legal status	Number and % of WASHCOs with legal status
	WASHCOs and Water Boards have 50% women members	% of WASHCO and Water Boards with 50% women members

Parameter	Outcome	Indicator
good governance in the WASH sector	Geographical equity increased	% of woreda/regions geographical equity within acceptable limits
	-- Program launch workshops held	Number of Program launch workshops held
	CSOs and emergency programs reporting to WASH structure on their plan, budgets, reports on expenditure and costs	Number % of CSOs/NGOs and emergency programs reporting to WASH structures on their WASH plans, budgets, costs and expenditure
	WASHCO, woreda, zonal RWCO, NWCO and federal staff trained in data collection and database management (WASH MIS, HMIS and EMIS)	Number of staff trained in data collection, database management, (WASH MIS, HMIS and EMIS) and reporting formats
	WASH data collected/analyzed using key performance indicators/NWI updated	% of standardized WASH data collection/analyzed using key performance indicators
	KWT, WWT, RWCO and NWCO prepare consolidated WASH progress reports monthly, quarterly and annually	% of consolidated reports prepared at all levels on a regular basis
	WASH review meetings held quarterly at all levels as per the WIF recommendations, including JSR and MSF, followed up	Number and % of quarterly WASH review meetings held by level JTR and MSF meetings held annually and biannually, respectively
	Technical and financial audits carried out	Number of technical and financial audits carried out/year
	No- functionality rate of Rural water scheme reduced to from 11.2% to 7%	% of non-functional rural water supply schemes
	Non-Revenue of water of all towns in all regions reduced from 39% to 20%	% of non-revenue water
	Category 1 to category II of towns reached 80% of full cost recovery, Category 4 towns reached 60% and category 5 towns reached 50% and all towns cover 100% O&M	% of full cost recovery
	100% water safety plan prepared and monitored for at least category 1,2 and 3 towns	% of water safety plan prepared
	100% Establish groundwater monitoring and catchment protection system around water supply sources implemented by Urban Water Supply Utilities	% established groundwater monitoring
4) Efficient use of resources	Capacity in groundwater knowledge and siting strengthened	% successful BHs/wells
		% reduction in drilling unit cost
	Sub-regional operation and maintenance units and supply chain outlets established	% increase in functioning rate of water supply systems in rural areas
		% of TWU supplying water more than 16 hours a day to all customers for category 1 ,2 and 3
	Per capita cost for urban water supply: Category 1 USD 319 Category 2 USD 74, Category 3 USD59, Category 4 USD 95, Category 5 USD 136 and for rural water supply per capita cost USD 89, USD 74 and USD 85 for self-supply, Spot supply and Piped Water supply respectively.	% reduction in per capita investment costs in town, cities and rural areas
	Per capita cost for urban sanitation: USD 342 for AAWSA, USD 162 for other towns and for rural sanitation USD 19.	
	Monitoring data analyzed and used in decision-making	
	Pilot/demonstration activities documented and scaled up	No. and type of pilot/demonstration activities scaled up
	Water supply in drought-prone areas prioritized to reduce water delivery by tanker	% reduction in water delivery by tankers

Parameter	Outcome	Indicator
5) Strengthened capacity of WASH sector actors for achieving and sustaining results	Woreda/zonal/regional staff trained in:	No. of trainees by gender
	2,655 High Level Professionals trained (600 water engineer, 240 geologist, 420 hydro-geologist, 75 hydrologist, 510 electromechanical engineer, 420 sociologist, 90 economist, 150 chemist and 150 biologists	
	7,800 Medium Level Professionals trained (4,050 water supply technicians, 3,390 E&M technicians and 360 drillers)	
	6,300 artisans and 320,000 caretakers	
	Standard bidding/contract management/supervision documents prepared	No. of manuals for tendering, contract management and supervision
	75 TVETCs/HSCs supported to offer WASH courses	No. (%) TVETCs and HSCs offering relevant WASH courses/No. of graduates
	11 women and youth-led entrepreneur groups established and linked to suppliers	No. and % increase women and youth-led suppliers of WASH products and services
	280 post-construction support units established/functioning for category 4 and 5 towns	% of post-construction support units established and functioning
	Health clubs established in schools	% of schools with active WASH/health clubs
	Water Boards established in Category III towns; capacity of TWBs in business planning, asset management, planning, monitoring operators, oversight of Program implementation, strengthened.	No. of category III towns establishing Water Boards No. (%) of TWBs in category I & II towns with adequate capacity to fulfill their roles in urban water supply
	TWUs trained in routine O&M, asset and financial management, customer relations, reducing UAW, etc.	% of TWU recovering full costs % of TWU recovering O&M and replacement cost
	1000 Vehicles and 74 vacuum trucks/carts, tool sets, office equipment, water quality testing equipment procured	No. of vehicles, vacuum trucks/carts, tool sets, office equipment, water quality equipment, etc. procured and distributed
	11 water quality laboratories supported at regional level	No. (%) water quality laboratories supported and operational
	Trained personnel in water and wastewater quality testing	% of water quality tests meeting Ethiopian water quality guidelines and discharge from wastewater treatment plant meeting WHO guidelines for agriculture use.

ANNEX 9: Preliminary Strategy Action Plan

This sub-section is termed "preliminary" since the iterative Phase 2 development process described **in Sub-section 7.3** may result in changed short to medium term targets and/or years to achieve the targets.

Table 7.6 Preliminary Strategy Action Plan, Phase II, OWNP-2018-2020

Goal 1: ***By 2020 provide safe and adequate water supply to rural communities with minimum service level of 25 l/c/d within a distance of 1 km from the water delivery point. Coverage to reach 85 % of the rural population of which 20% is with RPS***							**Achievement level**		
Result	**Core activities**	**Indicators**	**Baseline**	**Targets by Year**			**2018**	**2019**	**2020**
				2018	**2019**	**2020**			
1. Rural communities in woredas are provided with adequate and safe water with well-established governance system ensuring sustainability	• Regions map woredas by service levels and prioritize woredas to provide improved and safe water supply • Woredas involve and mobilize communities to participate in planning, construction and management • Organize governance mechanism (WASHCOMs) with at least 50% women members. • Train WASHCOMs on O&M, water handling, book keeping and reporting	1.1 Percent of households in rural communities served with conventional, clean, safe and adequate water supply access at a rate of 25 l/c/d within 1 km. with on spot supply and RPS	68.5	70	77	85			

Goal 2*: By 2020 Provide safe and adequate water service to urban communities*									
Towns/cities are provided with safe and adequate water as per their category	• Regions map and categorize towns and provide adequate and safe water • Towns establish utilities and utility management mechanism • Towns or town water board set tariffs for water usage • Towns/water boards establish O&M program, tools and spare parts • Towns/water board conduct continuous capacity building on O&M, water treatment, preventive maintenance, record keeping, water safety plan to sector staff	2.1 Percent of category 1 towns/cities provided with 100 l/c/d	54.7	61	70	75			
		2.2 Percent of category 2 towns/cities provided with 80 l/c/d							
		2.3 Percent of Category 3 towns/cities provided with 60 l/c/day							
		2.4 Percent of Category 4 towns/cities provided with 50 l/c/d up to the premises							
		2.5 Percent of Category 5 towns/cities provided with 40 l/c/d within a distance of 250 m from piped system							
Goal 3: *By 2020 Carry out study and design for urban waste water management system*									
Undertake 36 urban waste water management	• Towns/water boards/city administrations identify and document background information on the problem	3.1 Number of study and design of urban waste management system for Category 1,2,3 towns and cities		4	14	18			

system study and design.	• Set budget and time line to conduct feasibility studies on WWM program • Organize/hire professionals to design appropriate WWM system for the selected town/city								
Build wastewater management infrastructure for 6 towns/cities		3.2 Number of built WWM infrastructures for towns /cities with a population of 200,000 and more		1	2	3			
Goal 4: ***By 2020 decrease RWS Non-functionality rate of water supply system in rural communities***									
Number of nonfunctional water systems are decreased from 11.2% to 7%	• Regions together with woredas map non-functional water systems by category • Identify common problems • Design mechanism/budget and organize manpower and rehabilitate un functional water systems • Woredas with support from regions and NGOs etc. set a maintenance crew with tools and spare parts and communication system to maintain pumps and reduce downtime and non-functionality rates	Percent achievement of NFR from the present 11.2 % to the target of 7%	11.2	9	8	7			
Goal 5: ***By 2020 Empower women in WASHCOs management including in decision making***									
WASHCOMs are established with 50% women members	• Woredas involve communities including women in the planning process • Discuss with communities on roles and responsibilities in WS management	Number of WASHCOMs that increase membership to 50% and more		4,551	18,204	22,756			

	• Establish WASHCOMs with women participation of at least 50% • Train WASHCOMs on book keeping, O&M, setting tariffs etc.								
Goal 6. By 2020 Strengthen RWS community management through legalization of WASHCOs									
100% of WASHCOMs in all regions are legalized	• Regions register the number of • WASHCOMs • Regions advocate on the importance of legalizing WASHCOMs so that they function legally following government rules • Regions continue on capacity building to WASHCOMs to strengthen their water management roles	Number of RWS that legalize WASHCOMs by region		4,551	18,204	22,756			
Goal 7. By 2020 Establish supply chain for low cost WS technologies and spare parts									
Regions have motivated private sectors and established 20 supply chains for water supply	• Contact with Micro and Small Enterprise Agency and discuss Private sectors need for water supply • Discuss with TVET to develop curriculum for private sectors training • Establish systems, linkage mechanisms of the private sectors to funding agencies	Number of private sectors involved in water supply by category established in each region/ woredas		2	8	10			
Goal 8. By 2020 Establish WS extension supporting system at kebele level to enhance implementation of household and communal level self-supply water and improve O&M of RWS									

8. Establish 2000 water supply extension system to enhance implementation of household and communal level self-supply water and improve O&M of RWS	• Woredas discuss the advantage of self-supply and the support they can get from woredas • Woredas organize kebeles and communities to undertake enhancing self-supply water supply system • Woredas with support from regions prepare O&M manuals • Establish water safety mechanism from the source to use with community using self-supply and other on spot water systems	Number of WS extension supporting system established		200	800	1000			
9. By 2020 Ensure rural water supply safety through water quality monitoring and water safety planning and implementation									
9. Prepare 45,551 water safety plans	• Train selected water surveillance officers from among the staff • Purchase portable water analysis kits with adequate supply of reagents • Prepare a protocol on frequency of testing, recording and reporting • Have in stock water disinfecting chemicals	Number of water safety plans prepared		4,551	18,204	22,756			
10. By 2020 Establish ground water monitoring and catchment protection system around water supply sources to be implemented by rural WASHCOs.									
Establish ground water monitoring and catchment protection system	• Conduct surveys on all water systems and identify areas of concern	Percent of woredas who have established catchment protection and monitoring	.	10	40	50			

in regional woredas	• Plan and design protection mechanisms such as protecting from flood, animals, open defecation etc.	mechanism in woredas in each region							
11. By 2020 Decrease Non-Revenue Water for urban communities									
Non-revenue water for urban areas is decreased.	Establish a water policing mechanism to identify NRW hot spot areas	Decrease NRW from the 39% to 20% by 2020 for UWS utilities of category 1-3	39	37	29.5	20			
Goal 12. By 2020 improve water service hours in the 24 hours in urban areas									
Water service hours is increased to 16 hours per day within the 24 hours	• Assess possibilities of raising service hours • Enhance capacity to meet the plan.	Percent of towns that have improved UWS continuity to 16 hrs. per day excluding WS delivery through public taps for UWS utilities of category 1 to 3	.	10	40	50			
Goal 13. By 2020 enable cost recovery mechanism for urban water supply system									
Urban towns/cities utilities have established reasonable tariffs	• Prepare an advocacy statement to enable the establishment of cost recovery mechanism • Discuss the issue with water board and beneficiaries • Involve communities/beneficiaries before setting tariffs	Percent of towns that enable category 1, 2 and 3 towns recover their investment cost at least by 80%, Category 4 by 60%, Category 5 by 30 % and O&M cost by 100% for all towns		10	40	50			

Goal 14. By 2020 Ensure UW safety through water quality monitoring system and water safety planning and implementation for UWS utilities of category 1 to 3									
Urban utilities have established a regular water quality monitoring plan	• Train selected water surveillance officers from among the staff • Purchase portable water analysis kits with adequate supply of reagents • Prepare a protocol on frequency of testing, recording and reporting • Have in stock water disinfecting chemicals	Percent of urban utilities that established water quality monitoring and reporting program in woredas		10	40	50			
Goal 15. By 2020 Establish ground water monitoring and catchment protection system around WS sources to be implemented by urban WS utilities									
Utilities have made ground water monitoring and catchment protection a well-organized routine activity	• Establish groundwater monitoring unit with the necessary tools • Conduct surveys on all water systems and identify areas of concern • Plan and design monitoring and protection mechanisms such as protecting from flood, animals, open defecation etc.	Percent of water utilities in urban areas that establish urban water catchment protection mechanisms	.						
Goal 16. By 2020 Conduct capacity building to higher and middle level professional, artisans and caretakers									
Capacity building is conducted to higher, middle WASH	• Design training manuals for higher, medium professionals and artisans • Prepare the necessary supporting training materials • Use trained trainers for effectiveness	Number of higher level professionals trained		885	885	885			
		Number of medium level professionals trained		2,600	2,600	2,600			

professionals and artisans.		Number of artisans and caretakers trained of which 25% are women		112,100	107,100	107,100			
Goal 17. By 2020 Establish independent WS and Wastewater service regulatory agency to ensure high service quality									
Water and waste water management regulatory agency is established	• Design policy or identify existing policy to establish regulatory agencies • Advocate that higher political leaders agree and endorse to establish the agency as per government regulation	Number of regions that has processed the establishment of regulatory agency for water supply and waste water services.			11				
Goal 18. By 2020 enable category 1,2, 3, and 4 water supply utilities to have in their organizational structure responsible section for Waste water management									
A unit for waste water management within the utilities for category 1,2,3,4 towns is established	• Establish a unit for waste water management • Establish an integrated and coordinated mechanism with other institutions	Percent of 1,2,3,4 category water utilities who have established organizational structure		10	40	50			
Goal 19. By 2020 Increase the involvement of the private sector in the WS activities particularly in O&M of urban water supply utilities									
20 Private sectors are organized for water supply	• Map existing private sectors who would take the business	Number of new private sectors in water utilities who are engaged in water supply and O&M							

O&M in urban utilities	• Advocate about the business and attract private sectors to take up the business of O&M • Design a capacity building program for the private sectors								
Goal 20. By 2020 Strengthen WASH integration to meet the objectives of OWNP and establish coordination with the Ministry of Urban Development and Construction Affairs at all levels in all urban WASH interventions									
20. OWNP has integrated its national WASH plan with like ministries	• Advocate the health, development and economic impact of WASH with like ministries • Discuss ways and means to integrate the program and for coordinated action for WASH in urban areas • Establish standing committees of professionals overlooking design and intervention program • Establish forums for wider learning and sharing	Number of regions who established WASH integration with ministry of urban development.		11					
21. By 2020 Implement national ICT based M&E and MIS system for the subsector which enables to capture, collect, analyze and report the data of the sub-sector staffs and service beneficiaries disaggregated in sex and age									
21. ICT for M&E is established at all levels in Ethiopia	• Learn and share experiences of regions and NGOs and bilateral organizations who have started ICT based monitoring in Ethiopia • Speed up the ICT based national program and record real time information in the MIS	Number of regions that establish a functional ICT based M&E and MIS system		11					

	• Establish mechanism for reviewing and learning								

Table 7.7: Preliminary Strategy Action Plan for Sanitation in Phase II OWNP-2018-2020

Goal 1. By 2020 introduce community centered approach to sector staff at all levels particularly to woreda level (Primary Health Care Unit staff, Kebele WASH team, Kebele leaders, HEWs, HDAs, WASHCOS and Agricultural Extension Agents in all Kebeles in the country)									
Result	**Core activities**	**Indicators**	**Baseline**	**Targets by year**			**Achievements level**		
				2018	**2019**	**2020**	**2018**	**2019**	**2020**
Common ground with sectors and stakeholders and community members established.	• Prepare advocacy package prepared to suit the level of local residents, sector staff and officials • Include in the advocacy meetings stakeholders such as local NGOs, religious leaders and schools • Conduct a number of meetings to form common ground on the need of involving communities for behavior change program	Percent of woredas who advocate initiatives undertaken to establish common ground with sector staff and other stakeholders.		10	40	50			
Goal 2: By 2020 Increase the availability and consistent use of improved latrine from the present 28% to 82% In rural areas.									
Improved sanitation system with hand Washing increasing in all regions	• Identify respected, trusted and prominent residents, teachers and women affairs of a community together with HEW, WHDA • Create awareness on the problem of poor sanitation and hygiene to health and development • Train them on how successfully they carry out and sustain changes if committed and make their community ODF	Percent of improved sanitation coverage in each region by woreda	28	33	55	82			

	• Demonstrate simple improved sanitation construction and hand Washing devise using job • aides/pictures • Select community chairperson preferably women or religious leader and secretary (preferably HEW) for the committee Design an action plan on the way forward								
Goal 3: By 20 20 Increase proportion of ODF communities In kebeles from 18 to 82%									
ODF Kebeles are increasing in number in all woredas in Ethioia.	Design a follow up mechanism and a support program to the committee established in communities in all kebeles	Percent of kebeles in each region who have achieved ODF	18	24	50	82			
Goal 4. By 2020 increase hand Washing with soap and water from the present 17% to 82%									
Hand Washing with soap has increased in all Kebeles/ woredas in Ethiopia	.Design a follow up mechanism and a support program to the committee established in communities in all kebeles	Percent of households in kebeles who have achieved hand Washing with soap in each region	17	24	50	82			
Goal 5. By 2020 Establish supply chain for sanitation components and low cost WS technologies and spare parts									
Supply chains for sanitation established in all woredas in Ethiopia	• Map existing private sectors who would take the business • Advocate about the business and attract private sectors to take up the business of O&M • Design a capacity building program for the private sectors	Number of private sector companies established and started supply chain activities for WASH products		2	8	10			
Goal 6. By 2020 100% of schools will have hand Washing promotional materials in their schools									

Hand Washing promotional materials are made available and displayed in 100% 0f schools in Ethiopia	• Design simple interactive hygiene messages and distribute to all schools in woredas • Advise schools to use all walls, latrine shades, trees to be talking walls and trees with appropriate behavior change messages *(Use soap to WASH your hands after toilet etc)* • Prepare print materials such as posters to communicate WASH	Percent of schools in each region with hand Washing facilities with adequate provision of running water and soap		10	50	100			
Goal 7. By 2020 Improve full package WASH access from the present 3.2% to at least 40% of schools including MHM									
Institutions, donors and government support full package WASH service to schools.	• Advocate to funding agencies and government about the importance of providing full package WASH for schools than only one or two interventions • Arrange the construction of a functional MHM facility in schools even using local materials	Percent of schools in each region that have been provided with complete package of WASH services in Schools	3.2	6.9	21.6	40			
Goal 8. By 2020 Provide improved and gender segregated sanitation facilities with hand Washing from the present 36% to 75% of primary schools and 100% of high schools including MHM									
Gender separated improved sanitation and MHM facilities are increasing in all schools	• Organize parents and teachers association to participate and support to construct separate latrine for boys, girls, teachers • Organize fund raising festivals, or school days to raise money to support latrine construction • Plan to use revenues usually from coffee, crop, grass, and wood sales to support latrine **construction.**	Percent of schools in each region with adequate and gender segregated and improved sanitation systems	36	40	56	75			
Goal 9. By 2020 100% of health facilities with full package of WASH facilities including MHM facilities 100%									

Institutions, donors and government support full package WASH service to schools	• Advocate for the need of providing full package to health facilities	Percent of health facilities with full package of WASH services		10	50	100			
Goal 10. By 2020 Increase proportion of households using correct and consistent water treatment and safe storage from 10 to 35%									
Point of use treatment of water is practiced in households in Ethiopia	• Discuss the need of enhancing point of use treatment with the community centered committee • Discuss with water safety supply chains to make water disinfectant available to the locality	Percent of households practicing point of use (POU) water treatment.	10	13	23	35			
Goal 11. By 2020 prepare and provide pictorial job aides, operational manuals, implementation guidelines for use by Health Extension Workers to support facilitation of behavior change in communities									
Outreach do-able behavior change program is enhanced using job aides in Kebeles in Ethiopia.	• Explore WASH communication materials availability in the sector ministries • Evaluate the content and determine whether to use it or not • Design new or additional communication products • Kebele level HEW will need pictorial job aides which are available in the ministry of health	Percent of Kebeles provided with set of job aides including latrine construction, hand Washing, water safety measures, personal and environmental hygiene materials		10	40	50			