Development Cooperation of the Czech Republic in the Water Supply and Sanitation Sector in Southern Nations, Nationalities and Peoples Region in Ethiopia

Assessment report

30 September 2011

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National currency: Ethiopian Birr (ETB)

Inflation rate: 38.1 percent (June 2011)

Annual population growth in Loka Abaya and Aleta Chuko: 2.9% (sources: Woreda administrations)

Agro-ecologic zoning

Altitude (in Meters)	Terms
Below 500	Berha/Arid
500-1500	Kolla
1500-2300	Weyena Dega
2300-3200	Dega
3200-3700	Wurch
Above 3700	Kur/Frost

Source: UNOCHA July 2011

Acronyms and Abbreviations

ACF	Action Contre la Faim (French NGO)
ADLI	Agricultural Development lead Industrialization
AFD	French Development Agency
AfDB	African Development Bank
AMES-E	Access to Modern Energy Services – Electricity
BOFED	Bureau of Finance and Economic Development
CCRDA	Consortium of Christian Relief and Development Association *(previously CRDA)*
CDA	Czech Development Agency
CDF	Community Development Fund
CLTS	Community Lead Total Sanitation
CLTSH	Community Lead Total Sanitation and Hygiene
CRDA	Christian Relief and Development Association *(now CCRDA)*
CSO	Civil Society Organization
DAG	Development Assistance Group
DALY	Disability-Adjusted Life Year *(a unit measure for disease burden aggregating mortality and morbidity into a single measure)*
DC CZ	Czech National Official Development Assistance Programme
DFID	Department for International Development
ECC-SDCOH	Ethiopian Catholic Church Social and Development Coordination Office of Harar
EIB	European Investment Bank

EUWI	European Union Water Initiative
ETB	Ethiopian Birr
EU	European Union
FAO	Food and Agriculture Organization
FINIDA	Finish International Development Agency
GOAL	International Humanitarian Agency
GOE	Government of Ethiopia
GTF	Governance and Transparency Fund
GTP	Growth and Transformation Plan
HEP	Health Extension Program
HEW	Health Extension Worker
HH	Household
High-tech	High level technologies, in this report specifically (i) deep drilled wells with engine driven pumps with distribution systems; (ii) drilled shallow wells with hand or engine driven pumps and distribution system; (iii) springs with gravity systems (natural or engine driven) and distribution systems, (iv) solar energy systems
HSDP	Health Sector Development Plan
IEC	Information, Education, Communication
IFAD	International Fund for Agricultural Development
IRC	International Water and Sanitation Centre
JICA	Japan International Cooperation Agency
JTR	Joint Technical Review
KAP	Knowledge, Attitudes, Practices
KOICA	Korean International Development Agency
LARS	Access long-term action research studies
LPA	Learning and Practice Alliance
LVIA	Lay Volunteers International Association
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MFI	Micro-finance Institution
MIS	Management Information System
MOH	Ministry of Health
MOU	Memorandum of Understanding
MOW&E	Ministry of Water and Energy
MOWR	Ministry of Water Resources
MSF	Multi-Stakeholder Forum
NCA	National Construction Authority
NGO	Non-governmental organization *(used in this report interchangeably with SCO)*
NORAD	Norwegian Agency for Development Cooperation
NWCO	National Wash Coordination Office
NWSC	National Wash Steering Committee
NWTC	National Wash Technical Committee
O&M	Operation and Maintenance
ODA	Official Development Assistance
ODI	Overseas Development Institute
PASDEP	Plan for Accelerated and Sustainable Development to End Poverty
PIM	Program Implementation Manual (now WIF)
PIN	People in Need
PI	Project Implementer
PMU	Project Management Unit
PRSP	Ethiopia's Poverty Strategy Paper
RBE	Regional Bureau for Education
RHB	Regional Health Bureau
RBWM&E	Regional Bureau of Water, Mines and Energy

RiPPLE	Research-inspired Policy and Practice Learning in Ethiopia and the Nile Region
RWCO	Regional WASH Coordination Office
RWTT	Regional WASH Technical Team
RWSC	Regional WASH Steering Committee
RWSS	Rural Water Supply Scheme
SC	Steering Committee
SC USA	Save the Children USA
SDPRP	Sustainable Development and Poverty Reduction Program
SITAN	Situation Analysis
SNNPR	Southern Nations, Nationalities and People's Region
SOS Sahel Ethiopia	formerly the SOS Sahel UK programme in Ethiopia, an international NGO
SZDWM&E	Sidama Zonal Department of Water, Mines and Energy
TOR	Terms of Reference
TVET	Technical and Vocational Education and Training
TWG	Technical Working Group *(of the DAG)*
UAP	Universal Access Plan
UK	United Kingdom
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
USAID	United States Agency for International Development
USD	United States Dollar
WASH	Water Sanitation and Hygiene
WASHCO	Water Sanitation and Hygiene Committee
WB	The World Bank
WHO	World Health Organization
WIF	National Wash Implementation Framework *(previously PIM)*
WSDP	Water Sector Development Program
WSF	Water and Sanitation Forum
WSP	Water and Sanitation Program
WSP-AF	Water & Sanitation Program Africa Region
WSS	Water Supply Scheme
WSSDP	Water Supply and Sanitation Development Program *(of the WSDP)*
WWG	Water Working Group
WWT	Woreda WASH Team
€	Currency Unit of some member states of the European Union (EURO)

1 EXECUTIVE SUMMARY

1.1 Context of the assessment

This Assessment Report is the product of an assignment implemented by AKSES s.r.o. as a contractor to the Czech Development Agency (CDA). The purpose of the assessment was to obtain expert advice that will provide a precise focus of the Development Cooperation Programme of the Czech Republic (2011-2017) in the water and sanitation sector in Ethiopia. The conclusions of the assessment will be used by the Ministry of Foreign Affairs of the Czech Republic and the CDA for planning, identification and formulation of project activities.

The assignment has been conducted by a team comprised of Lead Expert Marie Körner, Technical Consultant Water Management and Water Structure Cherkos Tefera, Technical Consultant – Hydrogeology Jiri Pistora and Expert in International Synergies Ele Jan Saaf under the Management of AKSES Project Manager and with the support of Head Office Expert – Methodological Support and Quality Assurance.

The assignment started on 24 May with preparatory activities followed by field visit to Ethiopia including report drafting. The first draft was submitted to CDA on 14 August for review and comments. Presentation to the CDA was held at the premises of the Agency on 17 August. Written comments on the draft were received on the same day. The comments were incorporated in the second draft submitted on 31 August. On 14 September the CRA provided comments on the second draft incorporated in the draft report and complemented by a separate list of comments. These comments were incorporated in the final draft submitted on 30 September. The report is structured according to the Terms of Reference (TOR). Methodology for the assessment, based on the TOR and the Technical Proposal is described in section 2.

It should be noted that this report gives both practical recommendations as well as introduction of some key concepts necessary for sustaining Czech Development Co-operation interventions in the region. The intention is to provide a comprehensive argumentation as a result of the assessment for further formulation of particular projects.

1.1.1 Present state of affairs in water and sanitation

Ethiopia adopted an approach integrating water supply sanitation and hygiene (WASH) for stronger impact on health and environment. This is reflected in the current policies, strategies and plans governing the WASH sector as well as in the implementing and coordinating modalities. A WASH coordination mechanism with representation from water, health and education (in SNNPR also finance and economic development) institutions has been established and formalized by Memoranda of Understanding (MOU) at the National and Regional levels. This mechanism also includes donor and CSOs/NGOs WASH coordination entities. New plans, programs and strategies to enhance WASH implementation and monitoring, including the WASH Implementation Framework (WIF), have been drafted and are at different stages of review and approval. The present status of the mechanism is described in section 3.

Main conclusions: There is a need to further consolidate planning and to strengthen the WASH coordination mechanism. Roles and responsibilities related to WASH coordination at the local levels have yet to be clearly defined and formalized. The draft WIF presents an approach and methodology to achieve this. Consolidated, up to date information on the status of water supplies and sanitation is currently not available. The National Wash Inventory is being compiled and a National WASH MIS is under preparation. This will require strengthening monitoring and reporting links between the different levels.

1.1.2 Current situation in SNNPR

SNNPR is located in southern part of Ethiopia and covers an area of 112343 km^2, with a population of over 15 million. Sidama Zone, located in the eastern part of SNNPR covers about 6,538 km^2 and has population of about 3 million of whom 95% reside in rural areas. Population density is about 459. Capital city is Hawassa. Average land holding is about 0.38 ha per household (HH), with an average HH size of 5. High pressure on land leads to increasing migration to cities.

Major actors in the WASH include: *The Regional WASH coordination structure and government institutions* (MOW&E, MOH, MOE, National Construction Authority (NCA), RBWM&E, Regional Health Bureau (RHBs), Regional Bureau for Education (RBE), the SZDWM&E, and the Woreda WASH Teams (WWTs). *Donors, donor supported projects* (UNICEF, UNOCHA, the World Bank (WB), WB/DFID project RiPPLE). *NGOs/CSOs and their associations*: CRDA, GOAL, LVIA (Lay Volunteers International Association), NCA (Norwegian Church Aid), PIN (People in Need), Plan Ethiopia, SC USA, Water Action, WaterAid, WSF. *Private sector* (contractors, artisans, traders). *Educational Institutions*: Universities, colleges, technical and vocational education and training

institutions (TVETs). *Communities and water users*. Donors and NGOs have been increasingly focusing on capacity building.

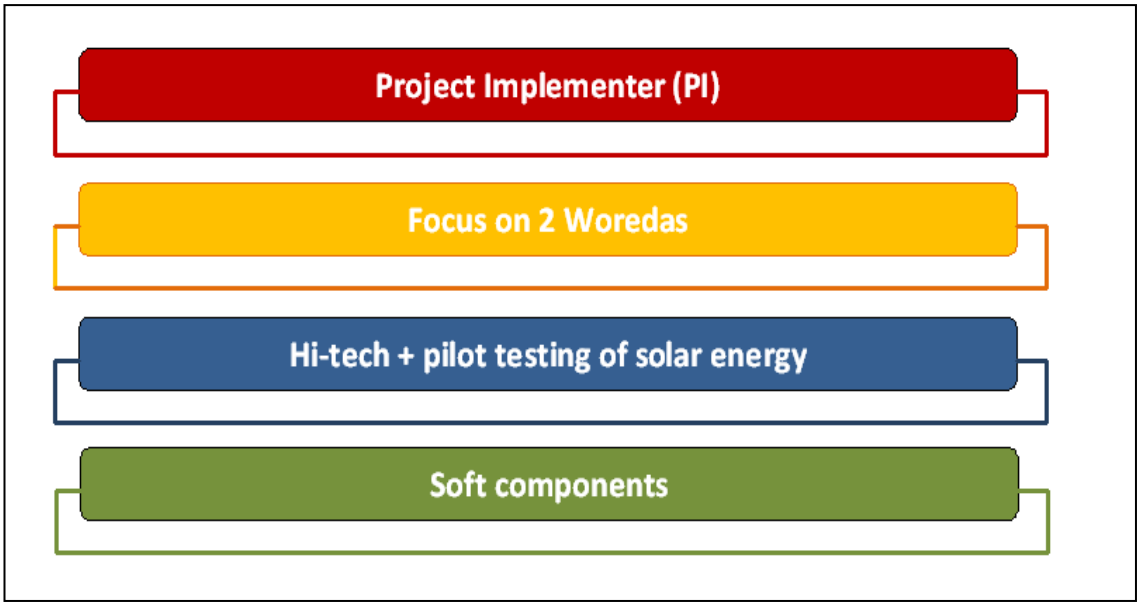
Drinking water coverage

Provision of access to clean water supply in Ethiopia has increased from 23% to 35% in rural and from 74% to 80% in urban areas during the period 2001/02 to 2004/05 according report issued by the Ministry of Finance[1]. It should however be noted that SNNPR and specifically Sidama zone has not been the main focus of water and sanitation activities in the past. Water and sanitation coverage in SNNPR is among the lowest in the world leading to high morbidity and mortality rates among the public in General, and children, women and the elderly in particular. Early 2011, the SZDWM&E collected secondary data from the 21 Woredas/towns on actual water access coverage (excluding non-functional schemes). According to this compilation, the average for Sidama Zone is 39%, for the rural Woredas about 33%[2] which is below the national average of 2005.

1.2 Main Conclusions and Recommendations

Main conclusions for future design of Czech DC interventions are depicted in the Figure below.

Figure 1.1: Main conclusions for project design



Justification

- Enhancing the role of project implementer (PI): Assessment confirmed that one of the most critical factors for successful project implementation is the ability and capability of project implementers to actively manage and integrate various components of project interventions which go beyond traditional engineering and project management approach. A comprehensive approach integrating “hard” and “soft” components is a prerequisite for sustainability of interventions. The estimated failure of some 50% of drinking water supply schemes in Ethiopia is to a high degree the consequence of neglecting “soft” components and participatory dialogue. It is strongly recommended that the Project Implementer (PI) will be located in the project area.
- Focusing on two Woredas: Reducing the scope would significantly increase effectiveness and efficiency as well as visible impact of Czech Development Co-operation in the region. Moreover such focus would enable to effectively monitor and evaluate project as well as broader socio-economic effects of water sector interventions financed by the Czech Development Cooperation. It is therefore recommended to reduce the scope to the kola areas of Loka Abaya and Aleta Chuko Woredas which both have a high priority for water supply development.
- Focus on lowland areas of Loka Abaya and Aleta Chuko calls for the deployment of hi-tech solutions (deep drilled wells with engine driven pumps with distribution systems, drilled shallow wells with hand or engine driven pumps and distribution system, springs with gravity systems (natural or engine driven) and distribution systems) where the Czech Republic with its extensive traditional and wide experience in regional hydrogeology has a comparative advantage; the assessment mission concluded that although hydrogeological surveys and drilling works are implemented in the SNNPR by private contractors and government organizations, there is a need for further transfer of know-how and on-the-job support and supervision of such surveys and drilling works if an adequate quality is to be assured. Paragraph detailing this comparative advantage is included in section 5.5.

[1] Ethiopia: Building on Progress: A Plan for Accelerated and Sustainable Development to End Poverty (PASDEP), 2009

[2] Water supply schemes in Ethiopia are officially divided in to 3 categories: functional, not functional but repairable, not functional and not repairable. The GOE official figures are based on functional + repairable unless specified otherwise.

- The cost of diesel is rapidly increasing and global warming has tangible consequences also in Ethiopia. It is recommended to support the shift to modern energies in Ethiopia including SNNPR/Sidama by piloting solar energy in Loka Abaya administrative centre. It is proposed to leave the ownership with the Woreda Administration/Water Office with trained technicians and capacity to closely monitor and possibly disseminate this technology and to closely cooperate with the AMES-E project on transfer of know-how and capacity building (the mission understands that cooperation has already been agreed in principle between the Embassy of the Czech Republic in Addis Ababa and the GIZ).
- Integrating soft components: neglecting community development and hygiene & sanitation promotion leads to decreased sustainability and effectiveness of drinking water supply schemes. It is recommended to follow the WASH approach and to build up competence and capacities of communities to increase likelihood of schemes providing clean drinking water on a reliable basis.

The above mentioned comprehensive approach will enable Project Implementer (and thus Czech Development Cooperation) to establish an implementation structure covering all critical components of project implementation. Further due to on-going presence of Project Implementer on the site, higher transparency of actions as well as accountability for results will be ensured. Last but not least capacity building activities will allow hands-on training for both communities and public administration through transfer of experience directly from the Project Implementer and thus ensure that intervention effects will sustain.

1.3 Assessment questions

Table 1.1: Section of report addressing the assessment questions

Question	Section of the report
Which Woredas are recommended for DC CZ in the water sector until 2017, given its budgetary and time constraints?	5.1
What is the **relevance** of potential DC CZ interventions in proposed woredas: • What percentage of inhabitants of proposed woredas have access to safe water? • Are those woredas not sufficiently served by other donors in the water sector?	5.2
What is the **feasibility** of potential DC CZ interventions in proposed woredas: • What water supply systems and technologies are used? What is the current technical condition of these systems? What are the main reasons for malfunction? • How is water distribution provided for? • How does water resource management work? What is the technical level of maintenance and repair of existing sources within local administration? • What are the hydrogeological conditions in currently proposed/or alternative woredas for DC CZ interventions and how plausible is the construction of new water sources?	5.3
Which **other donors** operate in Sidama zone and specifically in the proposed woredas in the water and sanitation sector? What technical solutions do they apply, how do they provide for management of water sources, how sustainable are their interventions, and what lessons learned can be drawn from their activities?	5.4, Annex X
What **engineering solutions** are recommended in individual proposed woredas (e.g. new drills versus reconstruction of existing drills, design of new drills, approach to the reconstruction, etc.)?	5.5
Recommended **non-engineering solutions** (soft components)[3]	5.6
What form of plausible **water resource management** is recommended?	5.7
What are the **estimated costs** of engineering solutions proposed?[4]	5.8
How do **local communities** perceive water supply and, consequently, how can DC CZ take local traditions into account to **maximize local ownership**?	5.9
How can DC CZ best **integrate cross-cutting principles of ensuring environmental sustainability and promoting gender equality** into its approach in the sector and area in question?	5.10
What principles should be observed in DC CZ's approach	5.11, 5.12

Scope (section 5.1)

The four proposed Woredas[5] are relatively large in terms of numbers of Kebeles (the lowest administrative level). Numbers of people without access to water and sanitation in each Woreda exceeds 70,000. Preliminary estimates indicate that the proposed project can provide access to drinking water to some 80,000 people. Reducing the scope to 2 Woredas would significantly increase effectiveness and efficiency as well as visible impact of the proposed project. The selection has been narrowed and Loka Abaya and Aleta Chuko selected as proposed priority Woredas on the basis of following criteria: demonstrated perceived need/pro-active demand – contributes to likelihood of sustainability; current levels of access; existing work of donor community complementing and creating a niche for the CDA interventions; construction of water supply schemes and related

[3] This assessment question has not been included in the TOR but has been addressed by the assessment because community development and sanitation and hygiene education are integral components of rural water supply projects.

[4] This section includes both the estimated cost of engineering and the estimated cost of non-engineering solutions to make the budgetary estimates complete.

[5] Loka Abaya (in replacement of Hula which is already covered by an NGO), Aleta Chuko, Aleta Wondo, Hawassa Zuria

WASH activities by NGOs and donors; and technological requirements. This has been discussed and agreed with the Zonal and Regional authorities as well as with the MOW&E.

The intervention can most likely be justified in terms of complementarities to engineering solutions currently used in the project area and bringing solutions particularly relevant for communities located in lower elevations. According to available information, activities by NGOs in both Woredas are very limited and that there are currently no plans for increased interventions by other donors. The proposed project is therefore considered relevant for both Woredas.

Feasibility (section 5.3)
Assessment results indicate that accessing of new water sources is technically the most feasible way to increase availability of drinking water in the proposed project area. The proposed project will improve access to clean water supply and support interventions aiming at changes in sanitation and hygiene behavior, as well as at proper sanitation around the newly constructed WSSs. It will thus contribute to decreased incidences of water borne diseases and of DALYs lost due to these disease. Resulting direct and indirect socio-economic impacts will subsequently improve socio-economic situation of the intended beneficiaries.

Relation and coordination with major stakeholders (section 5.4)
Possible areas of cooperation with the different stakeholders have been assessed and include: Hydrogeological and engineering surveys; implementation of construction works; improving sustainability; implementation on socio-economic needs survey and on basic KAP (Knowledge, Attitudes, Practices) study; alternative sources of energy; community development; sanitation and hygiene promotion; M&E, MIS; capacity building and training; supply of spare parts; sharing information, education and training materials, guidelines and manuals; improving convergence and coordination.

Recommended engineering solutions (section 5.5)
Recommended engineering solutions in selected priority Woredas Loka Abaya and Aleta Chuko are focused, in accordance with hydrogeological conditions, water resources situation and existing local experiences, especially to groundwater sources, which seem to be the best solution from both quantitative and qualitative point of view. In Loka Abaya, recommended solutions are deep wells with motorized pumps, pilot schemes powered by solar energy in the Woreda Administrative Centre, shallow wells fitted with India Mark II hand pumps and rainwater harvesting in schools and health facilities, and Kebele centers (where there is appropriate size and type of roof) may complement the above. In Aleta Chuko, recommended solutions are similar - deep wells with motorized pumps, shallow wells fitted with India Mark II, spring development with distribution system and rainwater harvesting in schools and health facilities, and Kebele centers (where there is reasonable size roof and proper type) may complement the above. The option of rehabilitating existing water source can be considered after detailed technical and socio-economic investigations that determine the cause of failure and whether it is cost effective, groundwater quality is satisfactory and whether technical rehabilitation will result in future sustainability.

Recommended non-engineering solutions (Section 5.6)
Recommended non-engineering solutions reflect the integrated approach and need for improved sustainability and include: (i) Socio-economic need assessment and reconsideration of interventions in areas where perceived need is low. Results from assessments would serve as a basis for formulating IEC (Information Education Communication) interventions. (ii) Community development activities for improved effectiveness and sustainability. (iii) Simple KAP study as basis for interventions in sanitation and hygiene promotion. (v) Plan for phasing out community development and sanitation & hygiene promotion interventions by the project to wean local partners (including WASHCOs, authorities, private sector or NGOs) off and facilitate sustainability. (vi) Self-monitoring mechanism based on dialogue and feed back for increased awareness, empowerment and ultimately for improved sustainability (checklists and self-scoring).

Form of water resource management[6] (Section 5.7)
Adoption of community management concepts for rural water supply is now an official policy. The appropriate implementation of this concept needs to be emphasized if the objective of scheme sustainability is to be addressed. Water resources management includes: Transparent management of funds; protection to prevent contamination; technical maintenance; provision of service to ensure optimal water resource utilization and as agreed with the water users; guarding against misuse, conflict resolution. Responsibility should rest with the legal owner. Some functions can be outsourced against payments. Attention needs to be paid to developing capacities adequate to implement the management tasks. A mechanism should be in place for periodic external and independent financial audit, controls and monitoring. The project should support the preparation of guidelines, manuals and check lists for such external audits and inspections.

Estimated cost of proposed solutions (Section 5.8)
The cost estimate is based on current prices. The final preliminary cost are calculated on the basis of June 2011 exchange rates; Actual budget depends on specifications resulting from technical survey and quotations and the

[6] In this report water resource management is understood to be the management of the water supply schemes

date of implementation (inflation rate in June 2011 was 38%). Cost of community development +sanitation and hygiene promotion is calculated at about 30% of the construction cost.

Scenario 1

Scenario 1 presents a five year project including solar energy pilot and preparatory phase to be completed by the same Project Implementer. Estimated cost: 74,080,000 ETB or 2,996,764 € Assuming 30% community plus Woreda contribution to construction, cost to the donor is € 2,482,808.

Scenario 2

Scenario 2 presents on 2.5 year project that can be completed by one implementer, including solar energy pilot and excluding most preparatory activities. Estimated cost: 34,100,000 ETB or 1,379,450 €. Assuming 30% community plus Woreda contribution to construction, cost to the donor is € 1,145,833.

Scenario 3

Scenario 3 presents a 2.5 year project that can be completed by one implementer, excluding solar energy pilot and most preparatory activities. Estimated cost: ETB 33,800,000 or 1,367,314 €. Assuming 30% community plus Woreda contribution to construction, cost to the donor is € 1,145,833.

Scenario 4

Scenario 4 presents a 3 year project that can be completed by one implementer, excluding solar energy pilot and most preparatory activities, Estimated cost: ETB 14,010,000 or 566,748 €. Assuming 30% community plus Woreda contribution to construction, cost to the donor is € 473,301.

Scenario 5

Scenario 5 presents a 3 year project that can be completed by one implementer, including solar energy pilot and most preparatory activities. Estimated cost: ETB 14,430,000 or 583738 €. Assuming 30% community plus Woreda contribution to construction, cost to the donor is € 486,650.

Maximizing local ownership (Section 5.9)

Two major issues need to be resolved: (i) Legal ownership by the communities represented by WASHCOs; and (ii) formalizing the duties and responsibilities of WASH partners at the local levels, based on actually available funds and capacities of the partners.

Cross cutting issues (Section 5.10)

Environmental sustainability: attention needs to be paid to groundwater quality protection based on geological and hydro-geological mapping; catchment protection and environmental safeguards; qualitative protection as environmental sustainability tool; quantitative protection (verification of input assumptions and feed back for future exploitation).

Gender equality: Water-related tasks are typically divided between women and children who are responsible for fetching and transporting water on the one hand and men who are making decisions about WSSs including their management and operation on the other hand. The project can contribute to equalizing the roles in several ways: Involving women in decision making (this may also improve sustainability); increasing women's share in WASHCOs; ensuring that women have a voice and that the voice is heard; facilitating women's direct involvement in implementation and financial management; women in existing WASH coordination structures or in related institutions should be encouraged to closely work with the project.

Sustainability (Section 5.11)

Issues presenting potential threats to sustainability have been identified in four factors influencing sustainability at the local level. The major threats include: organizational (WASHCOs) (WASHCOs are not a legal entity), cooperation with partners (identification of partners, definition of tasks and responsibilities); economic (tariff calculation and collection); and technical (spare parts, preventive maintenance and shortage of skilled technicians at the local level). It is proposed to set up a participatory monitoring and planning mechanism for timely identification of major threats and introduction of mitigation measures.

Recommendations for upcoming DCCZ (Section 6.1)

Focus should remain mainly on the lowlands of the two neighboring proposed priority Woredas and on high technology solutions where the Czech Republic with its extensive traditional and wide experience in regional hydrogeology has a comparative advantage compared to Ethiopian private and governmental organizations implementing hydrogeological surveys and drilling works. The mission assessed this aspect and concluded that although there are private contractors and government providers of such services, there is a need for further transfer of know-how and on-the-job support and supervision of such surveys and drilling works if an adequate quality is to be assured. Section 5.5 Proposed Engineering Solutions provides an explanation what is meant by "comparative advantage" of Czech expertise.

Possible synergies: For the hardware component, synergies are perceived mainly in exchange of know-how and capacity building except for the solar energy where close cooperation with GIZ is recommended. This is different for the software component. There are few competent hands-on capacity builders and implementers; these are typically NGOs. This is particularly true for sanitation and hygiene promotion. It is recommended, during the project formulation, to assess the potential, capacities and competence of potential partners identified in section 5.4 and to explore different cooperation modalities and options for possible co-funding.

Sustainable management, operation and maintenance: Focus on community development and sustainability support activities is a key pre-requisite. Close monitoring of the likelihood of sustainability and feed back with MIS is recommended.

Proposed implementation modalities (Section 6.2)
Channelling of funds: The mission recommends that CDA selects, through a proper procedure a company – Project Implementer (PI). Funds for project implementation will be channelled through the PI. Procurement can follow either GOE or donor CDA procedures.

It is recommended to *cover both Woredas under one and the same project* of 5 years duration to streamline and simplify implementation and the MOU. If necessary because of CDA guidelines and procedures, the 5 years can be divided in two projects each of 2.5 years duration.

The following implementation modalities are recommended (see 6.2.3 for details):
Project management and coordination is contracted to a company – PI. (ii) PI will select and QA (quality assure) a suitable sub-contractor to implement detailed technical surveys[7]. (iii) PI will prepare detailed designs (preliminary designs will be prepared by the CDA during preparatory phase) and documentation and supervise the works. (iv) PI will select and QA Ethiopian sub-contractor to implement the construction works including training of local technicians; (v) The PI will engage qualified and experienced staff to implement community development activities in close cooperation with local partners. While the initial information campaign, community mobilization and organization and socio-economic needs assessment will be implemented by the CDA during the preparatory phase the PI will, on the basis of the results define and implement community development and capacity building/training activities. (vi)The CDA will implement a KAP survey. The PI will identify and engage an experienced reputable and good NGO established in SNNPR for sanitation and hygiene promotion, based on the KAP survey results. PI will provide implementation support, methodological guidance and QA. Additional competences and capacities can be provided by the project in the form of seconding qualified staff.

Phasing: The project could start in Loka Abaya. After establishing the PI office and completing inception activities, implementation could start in Loka Abaya and inception activities in Aleta Chuko.

Other suggestions (Section 6.3)
CDA should closely monitor and supervise the project implementation and activities (supervision visits by a technical expert) throughout, but in particular at the early stages, when decision are taken about selection of sites.

The project should follow the integrated WASH approach for improved impact and sustainability.

Speeding up project formulation and signing of MOU before the GOE may express strong priority on channeling funds through the common fund.

[7] Both preliminary and detailed technical surveys were originally proposed for the PI. In a meeting on 17 August 2011, the CDA advised that all preparatory activities will be implemented by the Agency.

2 INTRODUCTION

2.1 Purpose of the Assessment

This ex-ante assessment was implemented to provide expert advice on focusing the forthcoming DC CZ programme (2011-2017) in the water and sanitation (WASH) sector and to guide decision-making of DC CZ in other ways in Ethiopia.

The scope of this assessment includes provisions of drinking water in integration with hygiene and sanitation (integrated WASH approach) for rural inhabitants of Sidama zone in Southern Nations, Nationalities and People's Region (SNNPR), with emphasis on Woredas identified as priority by the Regional Bureau of Water, Mines and Energy (RBWM&E), in comparison with neighboring Woredas.

Findings and recommendations will be used by the Ministry of Foreign Affairs of the Czech Republic and Czech Development Agency (CDA) for project planning and formulation including planning, identification and formulation of project activities.

2.2 Methodology

Methodology of assessment developed to answer assessment questions posed by the TOR was largely based on the consultant's Technical Proposal, taking into account, as much as possible, requirements for evidence based assessment. All information and data include reference to source. Participatory methods of information gathering were used where appropriate. The methods are described below, methodological tools including debriefing presentations and summaries are provided in Annexes.

Information related to the same assessment questions was gathered by different methodological tools from different primary and secondary sources and the data compared. Where information from different sources widely varied, all sources are mentioned; if one source has been chosen as most appropriate for this assessment, it is explained why.

2.2.1 Secondary data

Secondary data was gathered during the inception as well as during and after the field mission. Data was collected from the internet, from stakeholders and from libraries. Where possible, information on the same issue was collected from different sources and compared. List of documents and websites consulted is provided in Annex A.

2.2.2 Primary data

Meetings were held with stakeholders in Prague, Addis Ababa, Hawassa and selected Woredas in Sidama Zone.

Meetings in Prague
Meetings were held with the CDA, People in Need (active in WASH within the region) and with Aquatest (hydrogeological mapping of Ethiopia). For each stakeholder a checklist of issues and document has been prepared. Information on issues for discussion has been communicated to the stakeholders prior to the meetings. Information from the meetings was used to contact newly identified stakeholders, to organize work in Ethiopia and for drafting this report. List of meetings with checklists for each meeting is attached in Annex B.

Meetings in Addis Ababa
Meetings in Addis Ababa were held prior to departure to SNNPR (between 06 – 12 June) and after returning from Sidama (between 27 June – 01July). The team met with the Embassy of the Czech Republic in Addis Ababa, government organizations, and donors, local and international NGOs as well as with private sector representatives. For each meeting a checklist of issues has been prepared in consultation with the team and the Head Office Project Manager; their comments and suggestions were reflected in the final checklists. Proposed issues for discussion were communicated to the stakeholders prior to meetings along with the introductory documents provided by the CDA and the Embassy of the Czech Republic in Addis Ababa in Ethiopia. Information and documents from the meetings were used to revise the meeting schedule and issues for discussion in Addis Ababa, to prepare/follow up on meetings and field work in Sidama as well as for drafting this report. List of meetings with checklists for each meeting is attached in Annex C.

A briefing meeting with the Embassy of the Czech Republic in Addis Ababa held on 09 June provided valuable information and guidance for the assessment concept and the missions work. Notes from this meeting are attached in Annex D.

A debriefing meeting with the MOWM&E was held on 01 July. Presentation prepared for the debriefing is attached in Annex E, signed summary of the proceedings in Annex F.

Meetings in Hawassa
Meetings in Hawassa were held between 13 – 23 June with regional authorities and NGOs. A semi-structured questionnaire developed for gathering information from NGOs working in WASH sector in SNNPR is attached in Annex G. This questionnaire was meant to guide the discussion; usually only selected issues were addressed, depending on the NGO's focus and time available. Some NGOs however including Goal, LVIA and People in Need (PIN) extended additional support and completed the electronic version.

An introductory meeting was held on 13 June with representatives from the Regional Bureau of Water, Mines and Energy (RBWM&E) and the Sidama Zonal Department for Water, Mines and Energy (SZDWM&E). A copy of signed summary is attached in Annex H.

Debriefing meetings were held with the SZDWM&E on 22 June (presentation attached in Annex I, summary in Annex J) and with the RBWM&E on 23 June (presentation attached in Annex K, signed summary in Annex L).

List of meetings with checklists for each meeting is attached in Annex M.

Visits to Woredas
The team visited six Woredas: four proposed priority and two neighboring Woredas. Woreda visits itinerary is provided in Annex V.

In each proposed **priority Woreda** (Aleta Chuko, Aleta Wondo, Loka Anaya and Hawassa Zuria) the following meetings and discussions were held:

- Meeting with the Woreda Wash Team (WWT) where it has been established or with the Woreda Administration and relevant technical Offices where WWT has not yet been established.
- Visit to an existing water supply, meetings with
    - Representatives from Kebele and elders
    - WASHCOs
    - Health Extension Workers (HEW) and women
    - Transient walk and observations
- Visit to a location proposed for the project intervention
    - Meeting with representatives from Kebele and elders
    - Meeting with HEWs
    - Transient walk and observations
      (Meetings with communities in the proposed locations were not sought so as not to awake expectations.)

The team, strengthened by SZDWM&E specialist assigned by the Department Dead and Woreda Water Mines and Energy Office representative (one was assigned to accompany the team in each Woreda), divided in 2 groups: Two persons stayed in the Woreda office to finalize discussion and "inventory" of access to water supply and sanitation; the second group (including at least one Technical Consultant) proceeded to visit proposed locations or sites with existing water supplies. Later the team re-united and proceeded to visit the remaining location (s).

Due to time constraints the meetings could not be organized prior to the team's arrival; schedule for meetings was finalized and the SZDWM&E started to contact the Woredas on 13 June. Subsequently the groups we met were not always complete and/or not strictly limited to the intended participants. In such cases the consultant attempted to seek information from each defined group of informants separately. It worked quite well; usually representatives from each group were present and people were very cooperative.

Visits to non-priority Woredas
In Hula meeting was held with the Woreda administration and the respective technical Offices; the same semi-structured questionnaire was used as for meetings with proposed priority Woredas.

In Shebedino, the team met and discussed with the Woreda Water, Mines and Energy Office Head and proceeded to survey the spring protection scheme with gravity distribution system to be powered by solar energy (the scheme is under construction).

For each group, a **methodological tool** has been developed and applied; for the Woreda inventory a matrix has been designed. An overview of types of meetings, methodological tools used and Annex where to find the respective methodological tool is provided in the Table below.

Table 2.1: Methodological tools used during field work

Stakeholder	Methodological tools	Annex #
Meeting with WWT/Woreda Administration and Offices	Semi-structured questionnaires	Annex N (template)
	Structured matrices	Annex O (as completed by the Woredas)
Completed schemes		
Representatives from kebele and elders	Semi-structured questionnaire	Annex P (template)
WASHCOs	Checklist	Annex Q (template)
HEWs and women	Checklist	Annex R (template)
Proposed locations		
Representatives from Kebele and elders	Semi-structured questionnaire	Annex S (template)
HEWs	Checklist	Annex T (template)
Transient walks and observations	Checklist	Annex U (template)

3 PRESENT STATE OF AFFAIRS IN WATER AND SANITATION

3.1 Policy and strategic framework

3.1.1 National programs and plans

Poverty reduction has been the core objective of the Ethiopian Government. Ethiopia's Poverty Strategy Paper (PRSP), the *Sustainable Development and Poverty Reduction Program* (SDPRP), was approved by the Government in July 2002 and covers the period 2002/03-2004/05[8]. The strategy was build on four pillars: (i) ADLI (Agricultural Development Led Industrialization) & Food Security; (ii) the Justice System and Civil Service Reform; (iii) Governance, decentralization and empowerment; and (iv) capacity building with broad thrust on rural growth, accelerating private sector growth in the modern economy creating employment and incomes, and strengthening of public institutions to deliver services. Program's objective for the national water resources management was to enhance and to promote efforts towards an efficient, equitable, and optimum utilization of the available water resources on a sustainable basis to contribute to the country's socioeconomic development.

Plan for Accelerated and Sustained Development to End Poverty (PASDEP) prepared for the five year period 2005-2009/10 as the guiding strategic framework for the five-year period. The Plan represents the second phase of the Poverty Reduction Strategy Program (PRSP) process, which has begun under the Sustainable Development and Poverty Reduction Program (SDPRP). The main objective of the PASDEP is to lay out the directions for accelerated, sustained, and people-centered economic development as well as to pave the groundwork for the attainment of the Millennium Development Goals (MDGs) by 2015. The investment needed to achieve the goal is about US$ 300 million per year, compared to actual investments of US$ 39 million in 2001-2002.

Currently the Government of Ethiopia has embarked on a *Growth and Transformation Plan* (GTP), 2010/11-2014/15. The GTP is a strategic framework with the overriding development agenda to sustain rapid and broad-based growth path and eventually end poverty. It aims to foster broad based development in a sustainable manner to achieve the Millennium Development Goals and envisages a major transformation of the economic structure, seeking to double agricultural production and to significantly increase the share of industry in the economy. The plan seeks to achieve total access to electricity and safe water by 2015. The UAP (Universal Access Plan, 2009 revision), water and sanitation are included as sections. The implementation strategies of GTP for water supply are:

- Ensure dependable and sustainable water supply based on demand, supply and efficiency.
- Implement sustainable and feasible technologies to improve the rural water supply coverage.
- Implement active management and operation mechanism in existing water facilities before new scheme construction.
- To take care of the existing water schemes and ensure economic use of water.
- To fulfill the basic household demand and the water allocation and utilization beyond this demand shall be based on social and economic priorities.
- Capacity building at all levels of water resource management
- Priority to low cost schemes and implementing measures such as cost recovery in urban water supply.

3.1.2 The water and sanitation sector

There has been an increasing trend over the past 11 years to integration of water, sanitation and hygiene in the Government policies, strategies, programs and plans. The integrated implementation modality was formalized by the WASH Memorandum of Understanding (MOU). By now, the integrated approach has been fully adopted by the Government.

When *Ethiopian Water Resources Management Policy* was adopted in 2001, Ethiopian water and sanitation sector became an integrated policy objective. This was an important step in view of the inseparable interlink between health, sanitation and hygiene when it comes to their impacts on health.

In 2001 the government adopted a *Water and Sanitation Strategy* to translate the Policy in to action. The strategy aimed for more decentralized decision-making; promoting the involvement of all stakeholders, including the private sector; increasing levels of cost recovery; and integrating water supply, sanitation and hygiene promotion activities. The principal objective of the Strategy was to secure basis for the provision of sustainable, efficient,

[8] July 7 to July 8

reliable, affordable and users-acceptable WSS services to the Ethiopian people, including livestock watering, in line with the goals and objectives of relevant national and regional development policies.

On the basis of this Strategy, a 15 year *Water Sector Development Program* (WSDP) 2001/2 to 2015/16 has been formulated.[9] The WSDP defines concrete interventions in terms of projects and programs to achieve the water policy objectives, based on the guidelines set under the Water and Sanitation Strategy. The WSDP is divided into three five years development programs: short-term (2002 – 2006); medium-term (2007 – 2011); and long-term (2012 – 2016) land is composed of five major components:

- Water Supply and Sanitation Development Program
- Irrigation Development Program
- Hydropower Development Program
- Water Resource Development Program
- Institutional Capacity Building Program

Total financial requirement for the WSDP over the entire planning period of 2002-2016 were estimated to be US$ 7,444.8 million.

According to the *Water Supply and Sanitation Development Program (WSSDP)* of the WSDP the national water supply coverage is expected to increase from 30.9% (2002) to 76% at the end of the planning period. The sub-components of the WSSDP include;

- Urban Water Supply – urban water supply coverage is expected to grow from 74% at the base year (2002) to 98% at the end of the planning period
- Rural Water Supply – The Rural water supply coverage will grow from the 23% (2002) to 71 % at the completion of WSSDP
- Sewerage services – A substantial improvement in the sanitation coverage is also envisaged at the end of the planning period.

The WSDP/WSSDP targets for water supply in both rural and urban areas over the three planning horizons (short-, medium- and long-term) are presented below.

Table 3.1: WSDP/WSSDP targets for water supply

Status	Base year 2002	End of 2006	End of 20011	End of 2016
National	28.6%	38.3%	50.2%	71.3%
SNNPR	30.9%	45.1%	60.1%	76%

Source: WSSDP of the WSDP

The WSDP is currently under revision by the MOW&E.

The Universal Access Plan (UAP 1)

The UAP 2005/6 to 2011/12 is based on the rights approach and was prepared by the regional water bureaus and the Ministry of Water Resources (currently Ministry of Water and Energy) to accelerate progress towards full WASH coverage by 2012. Sanitation aspects were drawn from regional Health Bureaus and the Federal Ministry of Health. Target of UAP 1 for water supplies was 98% coverage in rural and 100% in urban areas with a growth rate of 9% per annum. The budget was estimated at 2.5 billion USD. Focus on affordable appropriate technology was (and remains) one of the key strategies. The UAP with its ambitious targets has helped donors and other development partners to align their various programmes with that of the Government. The following criteria have been adopted for water supply:

Table 3.2: Criteria adopted for water supply under the UAP 1

Setting	Per capital consumption	Service radius
Rural	15 liters /Capita/ day	1.5 km
Urban	20 liters /Capita/ day	0.5 km

Source: The official MOW&E website

The *WASH Memorandum of Understanding (MOU)* on the Integrated Implementation Modality of Water Supply, Sanitation and Hygiene Education signed in 2006 by the three Ministries (Water, Health and Education) has opened a room for collaboratively building of a national Water Supply, Sanitation and Health Program (WASH) and has paved the way to integrating water supply projects with hygiene and sanitation, harmonizing implementation procedures and support systems of contributing agencies, as well as fostering partnerships with non-governmental organizations and the private sector. The signing of the MOU has extended to regions; sub-national roles and responsibilities from the regional to Woreda levels (zonal level is not included). Main areas of cooperation include: Water supply; human waste management; water supply and sanitation for schools and health institutions; water quality controls and surveillance; sanitation/Hygiene promotion and hygiene education; personal hygiene; safe water chain; safe disposal of feces; solid and liquid waste disposal.

[9] The MOWR subcontracted Water Works Design and Supervision Enterprise (WWDSE); the formulation process was supported by the United Nations Department of Economic and Social Affairs and the United Nations Development Programme (UNDP).

It was realized that the UAP would need reformulation if it were to achieve its objectives and *UAP 1 was revised in 2009*, after a detailed assessment of the three years performance. The revised UAP was made to focus on securing water supply access to a total of 34.5 million people from 2009-2012, implying a two fold increase in implementation rate by giving emphasis to low cost technologies including but not limited to self-supply (family wells). The means to enhancing its implementation included community mass mobilization, advocacy and promotion, and developing minimum capacity at Woreda level. The plan was estimated to cost about 6.8 Billion Birr (2009 prices).

3.2 Legal and regulatory framework

Table 3.3: Legal and regulatory framework

Document	Brief description
The Constitution of the Federal Democratic Republic of Ethiopia, 8 December 1994	Access to water and clean and sustainable environment are anchored at the Constitution of the Federal Democratic Republic of Ethiopia. Relevant articles are reproduced below. Article 90 Social Objectives 1: To the extent the country's resources permit, policies shall aim to provide all Ethiopians access to public health and education, clean water, housing, food and social security. Article 92 Environmental Objectives: 1. Government shall endeavor to ensure that all Ethiopians live in a clean and healthy environment. 2. The design and implementation of programmes and projects of development shall not damage or destroy the environment. 3. People have the right to full consultation and to the expression of views in the planning and implementations of environmental policies and projects that affect them directly. 4. Government and citizens shall have the duty to protect the environment.
Ethiopian Water Sector Policy, Ministry of Water Resources, the Federal Democratic Republic of Ethiopia,2001	The overall goal is to enhance and to promote all national efforts towards the efficient, equitable and optimum utilization of the available water resources of Ethiopia for significant socioeconomic development on sustainable basis. General water resources management policy objectives: 1. Development of the water resources of the country for economic and social benefits of the people on equitable and sustainable basis. 2. Allocation and apportionment of water based on comprehensive and integrated plans and optimum allocation principles that incorporate efficiency of use, equity of access, and sustainability of the resource. 3. Managing and combating drought as well as other associated slow on-set disasters through i.a. efficient allocation, redistribution, transfer, storage and efficient use of water resources. 4. Combating and regulating floods through sustainable mitigation, prevention, rehabilitation and other practical measures. 5. Conserving, protecting and enhancing water resources and the overall aquatic environment on sustainable basis. The Policy lays out the fundamental guiding principles of water resources management towards the objectives: • Water is a natural endowment commonly owned by all the peoples of Ethiopia. • As far as conditions permit, every Ethiopian citizen shall have access to sufficient water of acceptable quality, to satisfy basic human needs. • In order to significantly contribute to development, water shall be recognized both as an economic and a social good. • Water resources development shall be underpinned on rural-centered, decentralized management, participatory approach as well as integrated framework. • Management of water resources shall ensure social equity economic efficiently, systems reliability and sustainability norms. • Promotion of the participation of all stakeholders, user communities; particularly women's participation in the relevant aspects of water resources management. The Policy lays guidelines on: • The general *water resource management* as well as the management of specific categories: Inland water; aquatic resources; water for tourism and recreation. • *Cross-cutting issues*: Water allocation and apportionment. Environment, watershed management, water resources protection and conservation. Technology and engineering (Standards and design criteria; consultancy and contracting; professional associations and technical publications; ownership, operation and maintenance; wells and drilling; drainage; dams and reservoirs management and operation; technological issues). Water resource management information systems, monitoring, assessment and auditing (management of water resource information; development of MIS). Economics of water: water cost and pricing (funding for water resources; water pricing). Ground water resources. Disasters, emergencies and public safety. Trans-boundary waters. Stakeholder issues. Gender issues. Research and development. Water quality management. Enabling environment (institutional framework; capacity building; legislative framework). • *Policy on sector issues*: Water supply and sanitation policy (overall objective; detailed objectives; general policies; details on drinking water supply policy; livestock water supply policy; water supply for industry and other users; sanitation policy; integrated water supply and sanitation policy). Irrigation policy. Hydropower policy.
Proclamation 256/2001 Definition of Power and Duties of the Executive	Proclamation 256/2001- reorganizes the executive organs of the Federal Democratic Republic of Ethiopia and defines the powers and responsibilities of the federal organ of government established for the purposes of water resources management. The Ministry of Water Resources (MOWR) is established under Article 4 (15) of Proclamation 256/2001.

Organs of the Federal Democratic Republic of Ethiopia	
Proclamation 147/2000	The detailed mandates of the MOWR are contained in Proclamation 147/2000. According to this legislation, the Ministry of Water Resources Development was the supervising body responsible for regulating the planning, management, utilization and protection of water resources. Consequently, It is vested with the necessary powers required for carrying out its duties. With respect to the policy making and implementation process, the following mandates of the ministry are relevant: o Preparation of national water policy, strategy and sector development program, o Preparation of various national standards pertaining to water quality, water works construction and other relevant standards, o Supervision and follow up of the implementation of the policy and strategy instruments as well as standards. The mandate under the last bullet (above), sets out the Ministry's oversight and regulatory powers over water resources management, including the water supply sub-sector. The Ministry carries out its duties and responsibilities through several departments, units and autonomous agencies.
Proclamation of 2010 to provide for the definition of powers and duties of the executive organs of the Federal Democratic Republic of Ethiopia	In 2010, the Ministry was reorganized by this Proclamation to combine both the water and the energy sectors. It is now called the Ministry of Water and Energy Resources (MOW&E). The Proclamation defines the powers and duties for each ministry including the MOW&E.
Health Policies, sector Plans, Programs and strategic Action Plans	The Ministry of Health formulated the National Health Policy, 2001, Ethiopia's Health Sector Development Plan (HSDP IV), 2010, and Health Extension Program (HEP), 2002. Recently a National Hygiene & Sanitation Strategic Action Plan (2011 – 2015) was promulgated following the GTP targets, which complement the UAP 2 document as a full WASH program. The Health Sector Policy provides foundation for the promotion of household and community level hygiene and sanitation. The Constitutional mandates were further clarified by the 2001 Health Policy, which states that "emphasis shall be given to control of communicable diseases, epidemics and diseases related to malnutrition and poor living conditions", and "development of environmental health". The Health Policy's "general strategies" promote "intersectional collaboration" including "accelerating the provision of safe and adequate water for urban and rural populations", "developing safe disposal of human, household, agricultural and industrial wastes and encouragement of recycling", and "developing measures to improve the quality of housing and work premises for health."
National Sanitation Strategy for Ethiopia December 2004	The Strategy, sponsored by the Ministry of Health, MOWR, Regional Health and Water Bureaus and the Water & Sanitation Program Africa Region (WSP-AF) takes in to consideration the integrated approach.
Public Health Proclamation, 2007	The Public Health Proclamation of 2007 states that "the active participation of the society in the health sector has become necessary for the implementation of the country's health policy". Article 12 on Waste Handling and Disposal states that: • Any person shall collect waste in a specially designated place and in a manner which does not affect the health of the society. • No person shall dispose solid, liquid, or any other waste in a manner which contaminates the environment or affects the health of the society. Article 13 on Availability of Toilet Facilities states as: • Any institution or organization providing public service has the obligation to organize clean, adequate and accessible toilet facilities for its customers. • Any city administration is responsible to provide public toilet and ensure its cleanliness. Article 20.2 states that "any person who disposes waste outside a garbage container in an manner that can cause the contamination of the environment or can create a health hazard, is punishable with simple imprisonment from three months to three years and with fine from Birr 1000 up to 9000." The Proclamation is an enforceable regulatory document, but it was anticipated (in Article 23) that "directives" would subsequently be issued to guide "implementation of the regulations issued under this Proclamation". A detailed regulatory directive was drafted by MOH and submitted to the Council of Ministers for ratification in 2010.
Water quality standards	MOW&E advised that draft national water quality guidelines have been prepared, approved by MOH and submitted for approval by the National Standard Authority; the Ministry currently follows the WHO guidelines (3rd Edition, 2008). [10] The SNNPRE drafted the proclamation on legalization. Approval by the Regional Council is expected before the end of 2012. The certifying agency for water quality is the MOW&E at the national and the RBOWM&E at the regional level.
Standards and design criteria	The Water Sector Policy 2001 calls to " …formulate and adopt national standards and criteria for the design, installation, construction, operation, maintenance, inspection and other activities in all water resources management undertakings"[11]. Until now, no such standards and criteria related to rural drinking water supplies have been issued. In some cases, the authorities and responsible parties use the standards and designs issued under the previous government that however are no longer valid.
Standards for drinking water consumption	The country-wide minimum standard to be reflected in the design criteria for water supply sources is set in UAP 2005/6 to 2011/12 as 15 l/person/day within a radius of 1.5 km (or 30 minutes return trip) for rural and 20l/capita/day for urban areas. (UNICEF defines access to safe water as 20 litres per person per day within a distance of 1-2 kilometres.)[12]

[10] The 1999 Ethiopian Water Resources Management Policy recognizes the need for and proposes development of standards for well drilling and construction, water quality as well as operation and maintenance.

[11] Ethiopian Water Sector Policy, The Federal Democratic Republic of Ethiopia, Ministry of Water Resources, 2001

[12] Unofficial estimate of the actual average long-term water consumption per inhabitant including livestock is between 25-50l/day.

	(SC USA advised on standard they follow for schools: 5 l/student (or teacher)/day)	
Standards for number of users by type of WSS (Source of information: Sidama Zone Department for Water, Mines and Energy)	On-spot spring	338
	Hand dug well, fitted with hand pump	270
	Spring with distribution (motorized scheme)	5000
	Improved household hand dug well operated manually, with a bucket system	6
	Hand dug well with rope pump	75
	Bore hole with motorized pump	3313
	Shallow well with hand pump	457
	River intake	27500
Revision of UAP (Water) draft report, December 2010 addresses i.a. feasible types/technology choices for rural WSSs and their minimum life time without the need for major repairs	Type of source	Minimum life time without major repairs
	Hand dug wells	5 years
	Drilled shallow wells fitted with hand pump	10 years
	Capped springs (point)	10 years
	Capped springs with distribution systems	10 years
	Motorized deep borehole with a distribution system	10 years

3.3 WASH coordination

The existing coordinating entities include:

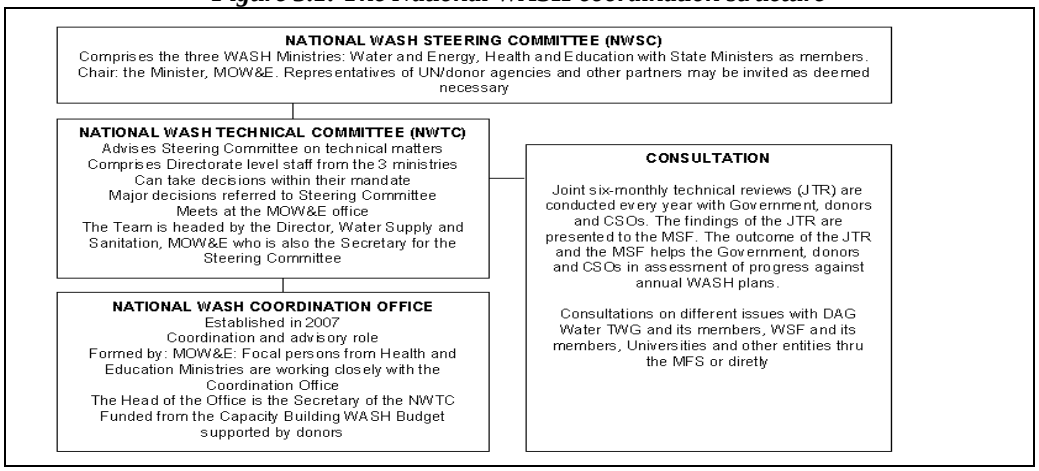
- The National WASH Steering Committee and its structures defined by the *Memorandum of Understanding (MOU) on the Integrated Implementation Modality of WASH, 2006*. The MOU was signed by the Ministry of Water Resources, Ministry of health and Ministry of Education.
- The "open door" *Multi-Stakeholder Forum (MFS)* organized as part of the Ethiopia Country Dialogue of the European Union Water Initiative (EUWI)
- The *Water Technical Working Group (TWG*) of the DAG (Development Assistance Group), comprised of representatives from multi- and bilateral donors and one representative of the Water and Sanitation Forum (WSF)
- The Water and Sanitation Forum (WSF) of NGOs under the umbrella of CCRDA
- Research-inspired Policy and Practice Learning in Ethiopia and the Nile region *(RiPPLE)* programme does not have a coordinating role. The processes of disseminating findings and producing outputs to inform and influence debates within the WASH sector however are believed to have contributed to harmonization of approaches.

There is an ongoing dialogue among the coordination entities/their members and both the Water TWG and the WSF work closely with the National WASH Coordination structure on policies, strategies, plans and other issues such as technical reviews or the WASH Inventory individually or as participants in the MSF.

3.3.1 MOU on the Integrated Implementation of WASH

The National WASH coordination structure depicted in Figure below is governed by the MOU on the Integrated Implementation Modality of Water Supply, Sanitation and Hygiene, 2006.

Figure 3.1: The National WASH coordination structure



Roles and responsibilities for each element of this structure are described in detail in the 2006 MOU.

Several issues related to the current situation are to be noted:

- Legal basis for the WASH Coordination Office has yet to be established. Ratification of WIF and (revised) MOU 2011 (to revitalize and simplify the 2006 WASH MOU) by the Steering Committee is expected before the end of 2011 will pave the way to legally formalizing the Office. In should be noted that while CSOs/NGOs are represented at the National WASH Steering Committee, such representation is not envisaged in the revised draft MOU.

- Regularity of meetings: The Steering Committee is to meet every 6 months. The last meeting was held at the end of June 2010. The NWTC has no fixed schedule for meetings and met last time about 6 months ago.

- The WASH Coordination Office is the Coordination Office for the WASH Project Management Units (PMUs) for: water, education and health. For the time being focal persons from MOH and MOE are assigned to work with the Office. The question is to what degree adequate coordination and integration of plans and strategies can be achieved with such limited resources.

- The current weaknesses in coordination are expected to be mitigated with signing the revised MOU which is expected to happen soon. A fourth signatory with higher leverage is envisaged (i.e. Ministry of Finance and Economic Development) that could facilitate more intensive dialogue among the signatories. Zones are expected to be included in the WASH structure which is particularly relevant for the proposed project.

3.3.2 Multi-Stakeholder Forum (MSF)

The Multi-stakeholder Forum (MSF) is the main vehicle for coordination of activities between the Government, donors, NGOs, the private sector and academia.

MSF is organized as part of the Ethiopia Country Dialogue of the European Union Water Initiative (EUWI). The EUWI was endorsed by the European Union Council on May 30th 2002 and then launched at the 2002 World Summit on Sustainable Development in Johannesburg. Ethiopia was selected to become a pilot country for Water Supply and Sanitation Country Dialogue component of the EUWI. The Objective of the Country Dialogue is to contribute to the achievement of Water and Sanitation related MDGs through improved coordination and strategic planning that are built on the consensus of stakeholders (Government, Donors, Civil Society and Private Sector).

The Ethiopian Country Dialogue, launched in November 2005 has been building on and adding value to what already exists in the country in terms of strategies and development plans of the sector. An EUWI Task Force was established at the beginning of the Country Dialogue and now is working on following up on and contributing towards the whole process. EUWI Task Force is co-chaired by the Ethiopian Ministry of Water and Energy and the Italian Cooperation Addis Ababa. It includes multi-stakeholder representatives, among which four sector ministries (Ministry of Water Resource, Ministry of Health, Ministry of Education and Ministry of Agriculture and Rural Development) and main donors of the WASH sector in Ethiopia and Civil Society Organizations.

The Country Dialogue process is planned to work through six phases:

- Preliminary phase
- Review of the existing National Framework in WSS and Finance Strategy
- Establishment of a Multi-Stakeholder Forum (MSF) and kick-off of a National Workshop to discuss the WSS Framework and relevant Financing Strategy
- Endorsement of the National WSS Framework
- Roundtable consultation on the Framework Financing
- Annual, Bi- Annual progress review meeting of the MSF Executive Committee and the key working groups to review progress on the Framework and monitor progress towards the MDGs

The Ministry of Water Resources/MW&E has played a key role in establishing MSF in collaboration with European Union. The MSF – an “open door” forum- has helped to bring donors, governmental organizations, NGOs, and the private sector together for scaling up Water Supply, Sanitation, and hygiene activities throughout the country. Multi-stakeholders Forum (MSF) and Joint Technical Review (JTR) are streamlined in to the Government activities (Figure 3.1). The World Bank, DFID, FINIDA, UNICEF and NGOs are considered as particularly important by the Directorate, Water Supply and Sanitation; the Directorate plays a key role in the coordination.

3.3.3 DAG Water Technical Working Group (TWG)

The Development Assistance Group (DAG) was established in 2001 initially as a forum for donors to share and exchange information. DAG comprises 26 bilateral and multilateral development agencies providing assistance to Ethiopia. The main objective of the DAG is to ensure a more effective delivery and utilization of development assistance to Ethiopia. The day to day coordination of DAG is managed by a secretariat based within UNDP

Ethiopia. The Technical Working Groups (TWGs) constitute an important part of the DAG which relies on their technical expertise in the preparation of policy papers, reviews of the Government Plans progress reports, update of the policy matrix and in providing recommendations for the way forward.

The Water TWG has been formed to facilitate effective delivery and utilization of development assistance in the WASH sector. The TWG includes over 40 representatives from over 20 multi-and bilateral donors and donor funded projects including: UNICEF, Italian Development Cooperation, UNDP-IFAD, FAO, UNECA, AfDB, The World Bank, WSP (Water and Sanitation Program administered by the WB), DFID, EIB (European Investment Bank), EU Delegation, Austria Development Cooperation, Embassy of Ireland, Embassy of Turkey, AFD (French Development Agency), Embassy of Kingdom of the Netherlands, NORAD, UNESCO, Embassy of USA, JICA, KOICA (Korea's International Development Agency), USAID, IWMI, UNDP/DAG. It also includes representative from the CCRDA Water and Sanitation Forum (WSF).

The TWG Co-chaired by UNICEF and the Italian Development Cooperation has been contributing to concepts, policies, plans, strategies and methodologies related to WASH coordination as well as to specific technical aspects as well as to overall coordination and harmonization of approaches both as a groups as well as through its individual members and member organizations.

3.3.4 Water and Sanitation Forum (WSF)

A Water Working Group (WWG) used to operate under the auspices of CRDA since the early1990s. In 2005 the Working Group was reactivated and served as an important platform for NGOs. The Group among others, initiated and facilitated the CSO WASH contribution study, organized various discussion forums and meetings for sharing relevant information, experiences and strengthening the group and represented CSOs working in the sector in various occasions. The dynamics and ever increasing challenges in the sub-sector call for a more integrated and coordinated responses of all stakeholders. Consequently the Water and Sanitation Forum of CRDA (WSF) was officially launched on 05 February 2008 to serve as a common platform for CSOs operating in the WASH sub sector in Ethiopia.

WSF has grown from the initial 50 to 79 members – national and international CSOs which is some 80% of CSOs working in WASH. This supreme decision making body of the Forum approves official documents and major decisions in quarterly or biannual meetings. The Steering Committee (SC) is comprised of seven member NGOs who carry out the daily work of the Forum, meeting monthly or twice a month depending on the need. The Committee comprise of volunteer NGOs who are then voted on by the Forum members.

The Forum's major objectives are:

- To engage in shared learning and promotion of best experiences in the sector;
- To engage in joint advocacy and lobbying in the sector;
- To network and build partnership among members for better coordination and collective impact in WASH sector; and
- To show the role and contribution of CSOs/NGOs in WASH sector.

More details on the organization can be found on http://www.crdaethiopia.org/wsf/about.php on CSOs contribution to the WASH sector in the CCRDA WSF Annual Joint Report on WASH for 2009/10. (Information from this Report is included in the National Report by the MOW&E).

Right from its birth, WSF has been working in close collaboration with the Ministry of Water Resources/ MOW&E and DAG Water TWG (where WSF is represented by one member) and actively participates in the Multi-Stakeholder Forum (MSF). The Forum has started establishing partnerships with relevant Federal and Regional government organizations, the private sector and other likeminded actors including regional and International organizations and Networks to work towards a common cause.

Current activities include (but are by far not limited to): (i) Support to compiling the WASH Inventory (CSOs play particularly important role because of their proximity to the grass root level). (ii) The Forum has also compiled a Directory of CSOs working in WASH which includes a description of the activities, capacities and geographical areas of work.[13] (iii) Advocacy and communication capacity assessment as part of the Governance and Transparency Fund (GTF).

There is a WSF Southern Regions Platform representative in Hawassa for the Southern Nations, Nationality and Peoples' Regional State[14].

[13] This Directory was available as a draft during the mission's visit and provided valuable guidance on SCOs working in SNNPR/Sidama.

[14] The position was not filled during the mission's visit

3.3.5 Research-inspired Policy and Practice Learning in Ethiopia and the Nile region

Commencing in 2006, Research-inspired Policy and Practice Learning in Ethiopia and the Nile region (RiPPLE) is a 5-year Research Programme Consortium funded by the UK's Department for International Development (DFID), aiming to advance evidence-based learning on water supply and sanitation (WSS). The RiPPLE Consortium is led by the Overseas Development Institute (ODI), in partnership with College of Development Studies at Addis Ababa University; the Ethiopian Catholic Church Social and Development Coordination Office of Harar (ECC-SDCOH); International Water & Sanitation Centre (IRC) and WaterAid-Ethiopia. WSF is member and provides support.

The overall objective of the Access LARS (Access Long-term Action Research Studies) is to help sector agencies to improve the transformation of investments (money) into WASH services. This will be achieved through in-depth research to better understand problems, promoting sharing of information and ideas, and testing innovations in the areas of WASH financing, monitoring, planning, and information management through action research.

RiPPLE operates within three regions of Ethiopia (including SNNPR but not the Sidama zone)**,** developing a new body of high quality policy and practice-relevant knowledge through the establishment of Learning and Practice Alliances (LPA) at different levels. The programme is implemented in three phases:

- Phase 1 (2006-8: research focused on the development of case studies covering a range of financing, growth, and governance and planning issues.
- Phase 2 (2008-9): two Long-term Action Research Studies (LARS) on Access and Growth have been implemented, building on the Phase 1 case studies and the priorities and concerns of LPA members.
- Phase 3 (2009-2011): Now in its third phase, RiPPLE is looking to use evidence from its research themes to build on policy- and practice-learning, and develop sector capacity to generate new knowledge in support of improved service delivery.

3.4 Plans, programs and strategies for enhancing WASH implementation

3.4.1 Planning, implementation and monitoring

A revised draft *WASH Implementation framework (WIF)* (previously PIM-Program Implementation Manual) has been prepared which is now under review by a team of experts in the MW&E with the purpose to provide the framework and guidelines for implementing the National WASH Program – undertaken by rural and urban communities throughout Ethiopia and supported and facilitated by governmental agencies, civil society organizations, the private sector and international donors.

The draft WIF has been prepared in advance of the inception of the fully harmonized and integrated Program. It *anticipates* how WASH will be structured, how it will be funded and how it will be implemented when a single Consolidated WASH Account is operational, when coordination structures are in place and when the key sectors and the NGOs are integrated in planning, implementing and reporting one WaSH Program. Perhaps the most significant feature of the new WASH Program is its degree of coherence – with many participants, many implementers, many partners and many contributors – but a single, national program that all can own and support and through which all can achieve their objectives.

The WIF includes features that may need to be considered by the formulation of the proposed project, depending on what is actually included in the approved document (expected before the end of 2011). The selected features of the draft considered of immediate relevance for the proposed project are outlined below.

- Institutional arrangements (relevant for rural WASH projects)
  The institutional arrangements for the WASH Program at the national level derive from the 2011 draft MOU. Enhanced WASH structures are foreseen also at the regional level with inclusion of NGOs. It opens the possibility of Zonal WASH structures. WWTs are to be established at every Woreda. Kebele WASH structures are to be established under the Kebele Manager, as subsidiary to the Kebele Development Committee. Enhanced and legalized WASHCOs (community WASH committees) at the community level.
  Capacity building activities of the proposed project may include support of local structures including formation of WWT in Aleta Chuko

- Financing and managing Rural WASH
  The draft WIF foresees four alternative modalities for financing and managing water point projects in the WaSH program**:**

- Woreda Managed Projects; Woreda manages the project including finance
- Community Managed Projects - Community manages the project including finance
- NGO Managed Projects
- Self-Supply Projects off-budget, owned and financed by HHs or by community groups

Donor managed projects are not foreseen in the WIF draft, but are currently acceptable to the regional authorities in SNNPR. The MOU for the proposed project will need to be clear on the financing and implementation modalities.

- Financial management and procurement
  Funds for WASH activities come from different sources:
  - The Government of Ethiopia[15]
  - External Financing Agencies (investors/donors) Donors' contributions[16] to WASH: It is proposed that donor contributions are transferred from a donor *Foreign Special Accounts* into the *Consolidated WASH Account* (CWA) administered by MOFED and flow through Channel to the governmental WASH implementing agencies at the national, regional, Woreda levels – and, in some instances to communities through intermediary micro-finance institutions (MFIs).
  - Non-Governmental Organizations (civil society)
  - Participating Communities

- WASH M&E
  - Monitoring of progress and results based on self-monitoring and reporting, built on the National Inventory
    The project monitoring system may need to consider supporting monitoring also for the National WASH Inventory; the draft WIF and manual is designed to provide the data required for a harmonized evaluation both at federal level through the JTRs and MSF as well as at local levels through the relevant structures. It is envisaged that regions and Woredas will replicate the JTR process that now occurs at the Federal level.

With the support from AfDB, *revised and updated version of the Water Supply and Sanitation Development Program* has been drafted and is available with the MOW&E.

MOW&E is now *revising the UAP,* aligning it with the GTP. The revision *(UAP 2)* will take into account the lessons learnt from the first five years of UAP implementation and the major challenges and opportunities facing the sector. Focus is on water supply development by using the natural (water) resources, the administrative - institutional system and the socio-economic system as bases for planning. 100% access is foreseen for 2015, with an annual growth rate of 6-7%. The following issues have been pointed out by the Water and Sanitation Directorate of the MOW&E:

- Financing gap (9.7 billion ETB are required to implement UAP2)
- The need to intensify promotion and to mobilize communities for self-supply especially where ground water is shallow (TA and materials provided by the Government)

Integration, augmenting resources: *Scaling up the use of Community Development Fund (CDF)* funding mechanism, that was introduced in Amhara and Benishangul Gumuz regions and that emerged as an effective way of harnessing local communities to implement their own WASH programs and achieve results at scale.

The National WASH Coordination Office (NWCO) is expected to become a legal entity and to be strengthened.

3.4.2 Wash Inventory

The comprehensive *National WASH Inventory* has been launched and should be completed and an MIS set up before the end of 2011. The MOW&E expects updates of the MIS from the Woredas in not less than six-monthly intervals. Phase I included Dire Dawa, Harar and Afar Regions and is almost finished. SNNPR is included in Phase II, now in progress. Baseline obtained from the Inventory can be used for adopting iterative and analytical planning methodology.

A detailed questionnaire is used to gather the information on: (i) Village level safe water supply inventory for rural areas and small towns. (ii) Village level Health Institutions WASH facilities inventory. (iii) Village level school WASH Inventory. (iv) Inventory of HH Hygiene and sanitation – Rural and Urban areas. (v) Inventory of household drinking water supply – urban and rural. (vi) Urban water supply utilities water supply scheme inventory – water source data. (vii) Existing urban water supply connection types and number by town. (viii) Urban

[15] GoE supports WASH directly and indirectly through a number of channels one of the most significant being the Food Security (Productive Safety Net Program) that invests substantially in construction of WASH facilities. (PSNP funds currently are not administered through any of the WASH accounts. They are, however, through "resource mapping" taken into account in the WASH planning and budgeting process.

[16] The possible inclusion of government WaSH investments being deposited into the Consolidated WaSH account has not yet been addressed.

water supply annual production and consumption inventory. (ix) Urban water supply utilities staff capacity inventory. (x) Urban water supply utilities tariff rate and financial status. Funding comes mainly from the PBS (Protection of Basic Services) budget line, WB and DFID. NGOs, under the overall coordination of the WSF are providing support in the form of logistics and training.

The Inventory will be important source of information for the formulation of the proposed project. Information on the planned, ongoing and completed WSSs will be fed in to the MIS, at the Woreda/SNNPR level.

3.5 Conclusions

It has been fully recognized that clean water, hygiene and sanitation are inseparably interlinked when it comes to health impacts and over the past 14 years considerable progress has been achieved in Ethiopia towards the integrated approach. A good progress was also achieved towards coordination and convergence of WASH plans, budgets, activities and M&E as well as towards decentralization.

However, there are issues which are being addressed and may be resolved with time, but, considering the principles to be taken into account,[17] present a challenge to successful implementation of the proposed project.

- Absorptive capacity at all levels (many major donor programs have 70% or less implementation rate against their plan). According to the MOW&E, it is a problem in particular for the "software" component - prerequisite for sustainability and efforts are focused on capacity building.
- The Government, donors and NGOs plans in the WASH sector have yet to be consolidated[18] , the WASH Coordination Offices legalized and the overall coordination strengthened. The increasing need for involvement of the private sector is being recognized. However, in Sidama Zone, an effective mechanism facilitating such involvement has yet to be put in place.
- Monitoring and reporting links between the different levels have to be strengthened.
- Regulatory framework and standards for rural water supplies have yet to be consolidated.
- Currently, information about access, ongoing and planned projects and donor activities and other relevant aspects or sources of such information is not readily available and has to be compiled from different, not always consistent sources.
- According to the MOW&E, some 20% of the existing WSSs are not functional[19] (observations by the team in the field lead to conclusion that this figure is higher).
- While capacities for infrastructure related services and works are available in the country, to some degree also in SNNPR, expertise in promoting and facilitating sustainable improvements in hygiene and sanitation within the government structures remains weak.
- There is a limitation of self supply due to lowering of ground water table in some areas; the low-tech solutions used for self-supply are not appropriate for areas with limited rainfall and deep water levels. High-tech solutions are restricted due to financial and technology limitations the government and NGOs are facing.

Under the current scenario, channeling funds through the government institutions and leaving implementation in the hands of institutions that need further capacity building and strengthening would not guarantee transparency, accountability or effective and efficient implementation of the proposed technologies and innovations within the given time frame. Duplications may arise. Sustainability of the newly created WSSs and reliable provision of clean drinking water would remain low.

This leads to the conclusion that appointing a Project Implementer who would be present on the site and manage, coordinate and quality assure project activities for this proposed project is the best solution.

Capacity building and transfer of know how in both soft- and hard components are considered essential tasks of the PI to ensure as much as possible a smooth phasing out and high likelihood of sustainability after the project completion.

- Although the ownership and management of RWSSs has been decentralized, the responsibilities at the local level have yet to be clearly defined; there are no legal entities/managers for the completed WSSs.

[17] These principles are listed in section 1.2 of this report

[18] There is an intention to have a consolidated, harmonized WASH plan that will allow for prioritization and monitoring. This is foreseen to be realized when the WIF is fully put in place.

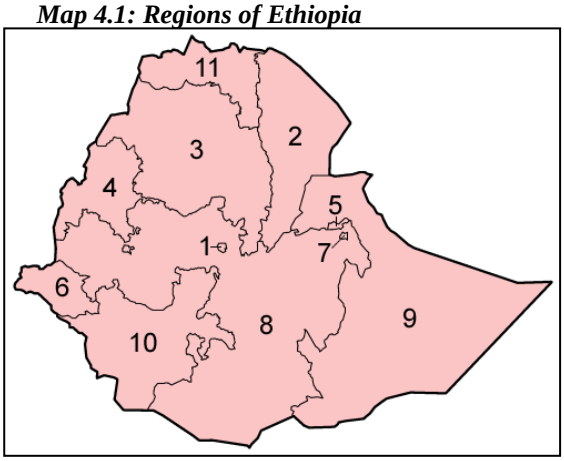
[19] The Government definition includes currently not functioning but repairable schemes under functional)

4 CURRENT SITUATION IN SNNPR

4.1 Background information on SNNPR and Sidama

The SNNP Region is located in southern part of Ethiopia and belongs mostly to Western highlands; it also includes outer lowlands in its southern part, the Rift Valley, and partly the South Eastern highlands. SNNPR shares most of its internal boundaries with Oromia in the east and Gambella in the west. It borders South Sudan in the west and Kenya in the south. Area covers 112343 km^2 and population is over 15 million. The capital city is Hawassa. (Information for this section was compiled from Central Statistical Agency, Atlas 2009, First draft, Volume 7 SNNP Regional State.)

Map 4.1: Regions of Ethiopia

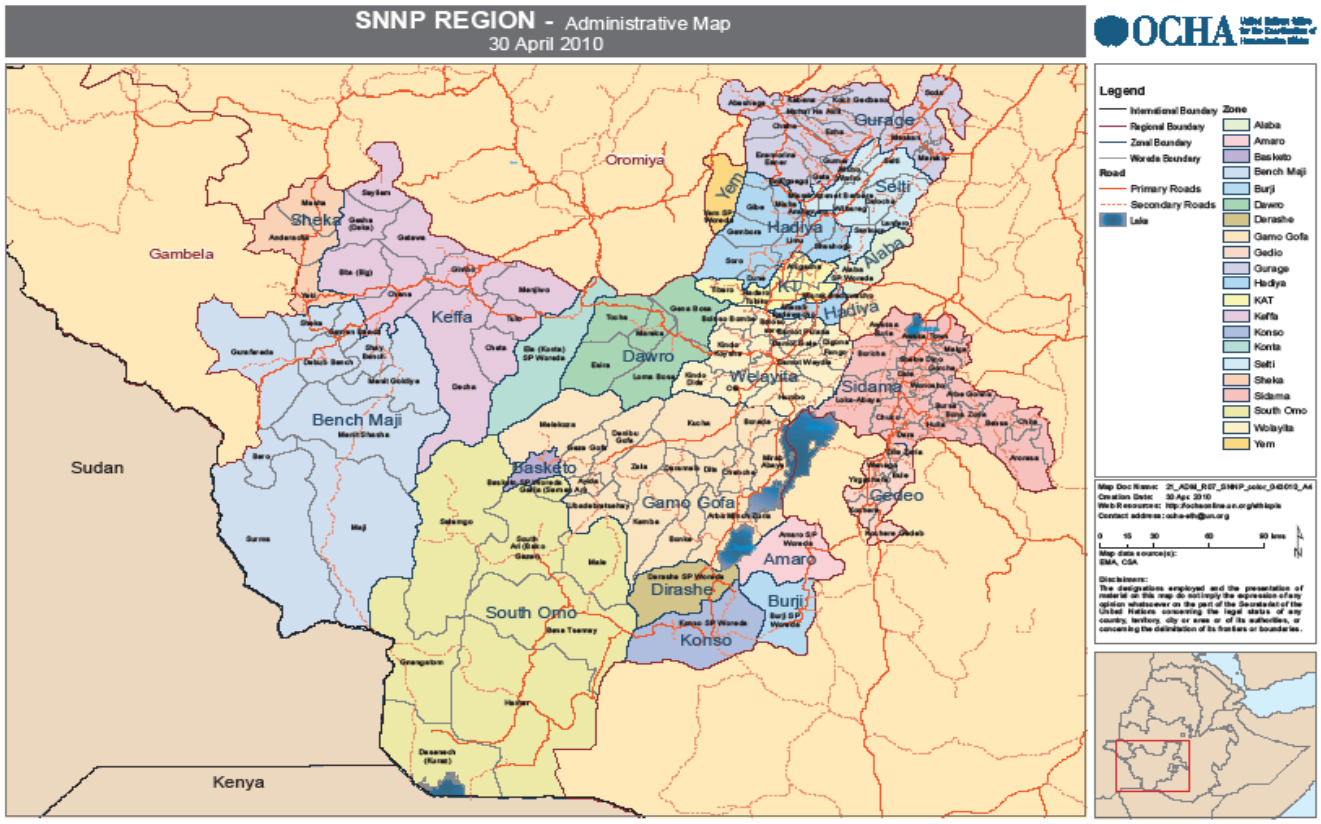


Regions
1. Addis Ababa
2. Afar
3. Amhara
4. Benishangul-Gumuz
5. Dire Dawa
6. Gambela
7. Harari
8. Oromia
9. Somali
10. SNNP
11. Tigray

Source: http://en.wikipedia.org/wiki/Ethiopia

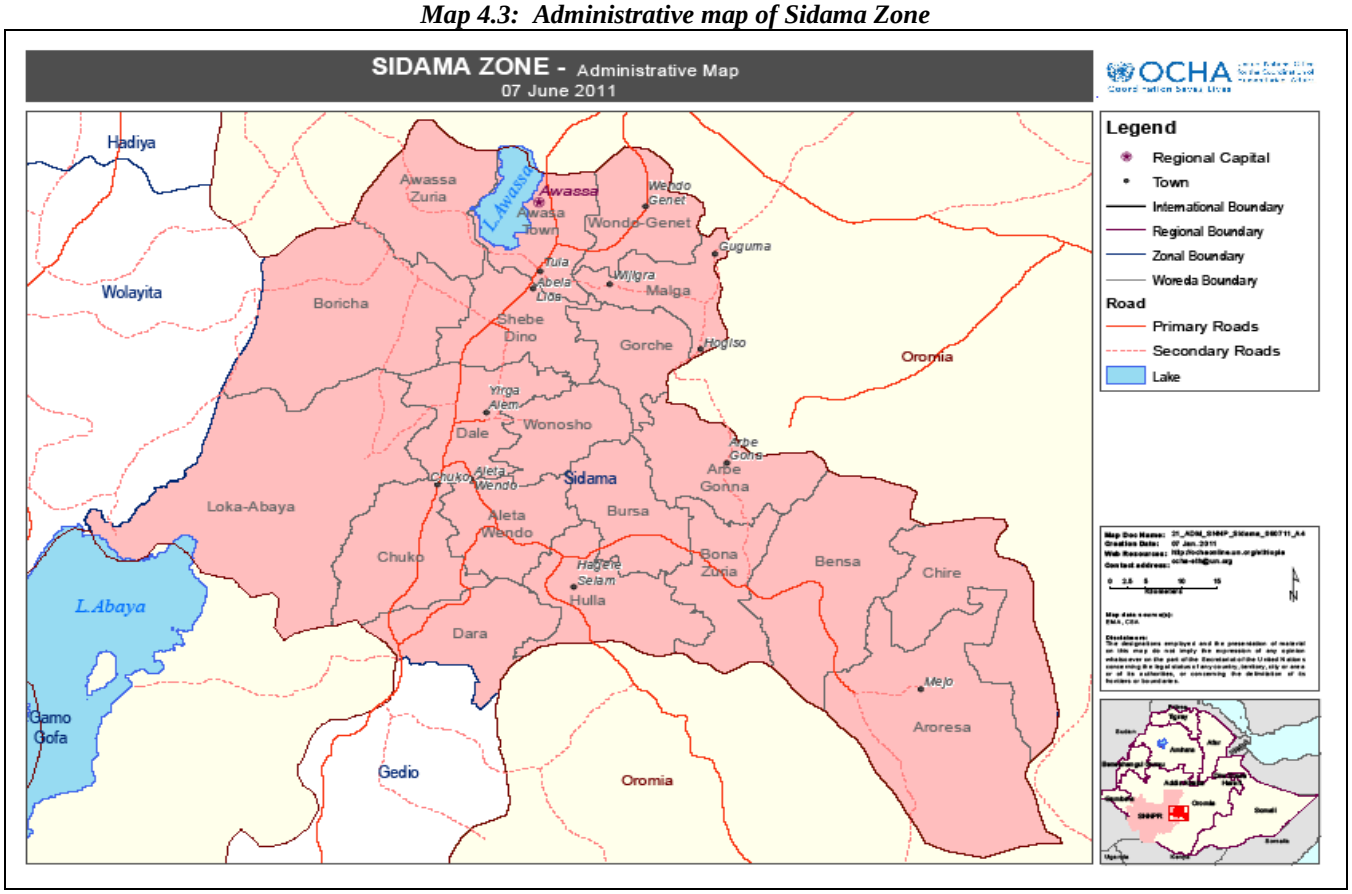
Sidama Zone is located in the eastern part of the SNNPR (see map below) Total population amounts to about 3 million people, with the some 95% residing in rural areas. Average population growth is about 3%. Sidama is composed of 21 Woredas (including Hawassa) of which 19 are rural. The average altitude is over 2000 m a.s.l.; capital city is Hawassa.

Map 4.2: Administrative map of SNNPR



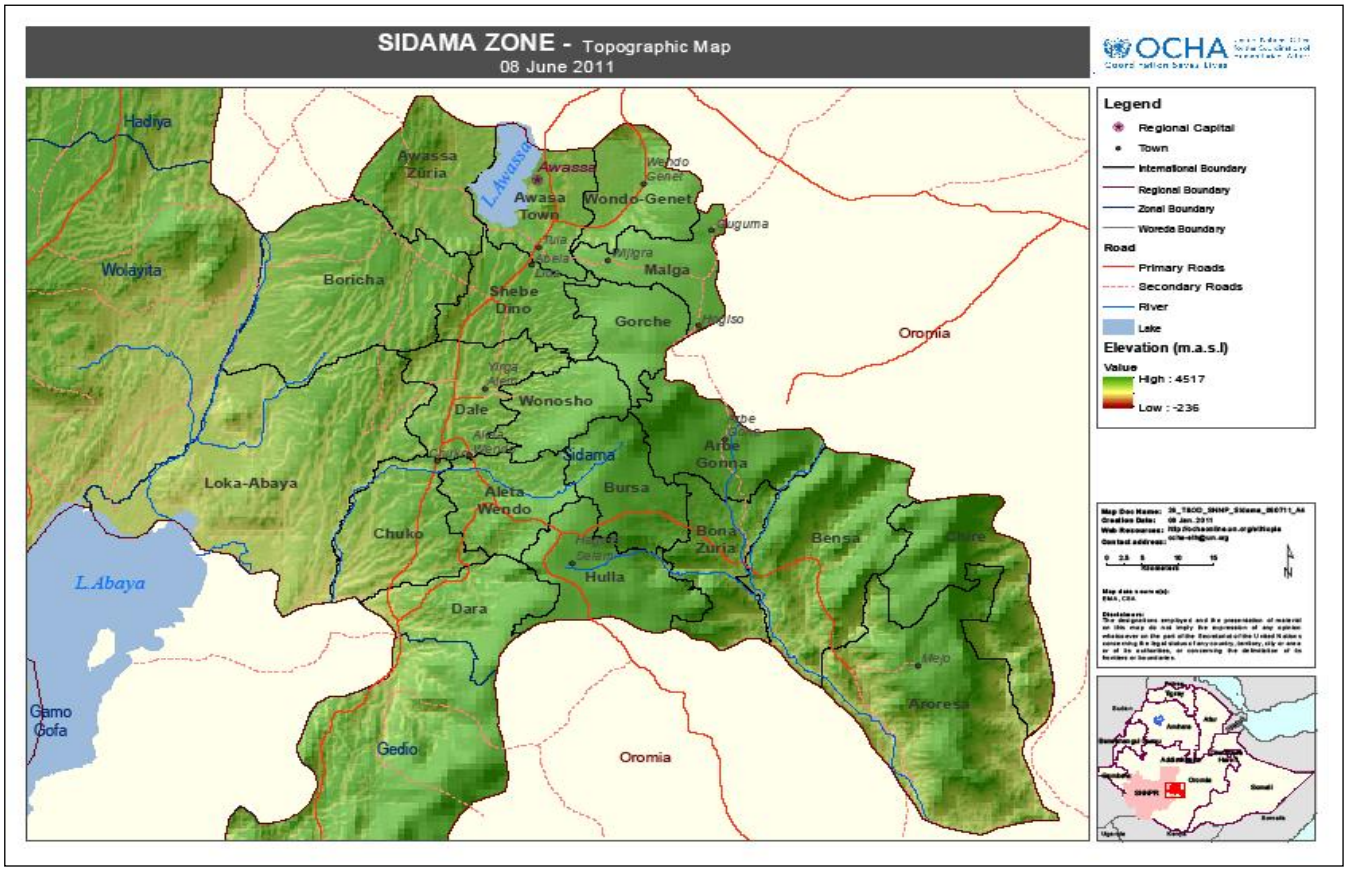
Source: UNOCHA Ethiopia, June 2011

Map 4.3: Administrative map of Sidama Zone



Source: UNOCHA Ethiopia, June 2011

Map 4.4: Topographic map of Sidama Zone



Source: UNOCHA Ethiopia, June 2011

Average population growth is 3%, pressure on land is large. Average landholding is between 0.25-0.5 ha. This has negative implications for watershed management and leads to increasing migration to urban centers, mainly Hawassa.

Main cash crops: eucalyptus and coffee. Main food crops: enset (false banana), sweet potato, Irish potato, maize.

Communication: Internet is available only in major towns, with unreliable and slow connections. Mobile phones are relatively reliable.

4.2 Major stakeholders

4.2.1 Overview

The major stakeholders include:

- Government institutions: MOW&E, MOH, MOE, National Construction Authority (NCA), RBWM&E, Regional Health Bureau (RHBs), Regional Bureau for Education (RBE), the SZDWM&E, and the Woreda WASH Teams (WWTs).
- Donors, donor supported projects: UNICEF, UNOCHA, The World Bank (WB), WB/DFID project supporting formation of WWTs, RiPPLE
- NGOs/CSOs and their associations: CCRDA, international humanitarian agency GOAL, LVIA (Lay Volunteers International Association), NCA (Norwegian Church Aid), PIN (People in Need), Plan Ethiopia, SC USA, Water Action, WaterAid, WSF
- Private sector: Contractors, artisans, traders
- Educational Institutions: Universities, colleges, technical and vocational education and training institutions (TVETs).
- Communities and water users

NGOs are more involved with rural water supply and sanitation activities than with urban. Due to the capacity constraints/ low absorption capacities and sustainability at the regional and local levels, a number of donors and NGOs have been increasingly focusing on capacity building of government institutions as well as communities.

An overview of identified potential[20] major stakeholders relevant for the Sidama proposed project, divided by category and by administrative levels is provided below.

Roles, potential cooperation and synergies with major stakeholders including donors, donor funded project, NGOS/CBOs and the private sector is summarized in section 5.4 *Relation and Coordination with major stakeholders.*

Table 4.1: Identified potential stakeholders for the proposed project

Category	Central level	SNNPR & Zonal (Sidama) level	Woreda	Kebele level	Communities
Government and semi-governmental institutions	Ministry of Water & Energy (MOW&E) Ministry of Mines -Geological Survey of Ethiopia	Regional Bureau of Water, Mines and Energy Resources (RBWM&E) Zonal Water, Mines and Energy Resources Department (SCDWM&E)	Woreda Water Office, Woreda Administration		
	National Construction Authority				
	National WASH Coordination Office (not a legal entity)	Regional WASH Coordination Office (not a legal entity)	Woreda WASH Team (not a legal entity)	Kebele WASH Team (informal)	WASHCOs (not a legal entity)
	Ministry of Health	Regional Bureau of Health	Woreda Health Office	Health Extension Workers	Clinics Health posts
	Ministry of Education	Regional Bureau of Education	Education Office		Schools, Technical &Vocational Training Institutes (TVETs)
	Ministry of Finance and Economy	Regional Bureau of Finance and Economic Development (BOFED)	Office of Finance and Economic Development		
			Office of Agriculture	Development Agents	

[20] The word potential is used to emphasize that this overview is meant as a point of departure for identification of stakeholders for the different activities during and after the project preparation and implementation

Category	Central level	SNNPR & Zonal (Sidama) level	Woreda	Kebele level	Communities
			Office of Women and Children Affairs		
Donors, donor supported projects	UNICEF				
	UNOCHA				
	The World Bank DFID	The World Bank/DFID capacity building project (PMU at the RBWM&E)			
	RiPPLE				
NGOs/CSOs	CCRDA (Consortium of Christian Relief & Development Associations)	CCRDA Southern Region Platform			
	(WSF)				
	LVIA (Lay Volunteers International Association)	LVIA (Sheshamane Office covers SNNPR)			
	Norwegian Church Aid (NCA)				
	SC USA (Save the Children USA)	Regional Office in Hawassa	*Hula, Aleta Chuko* (1 kebele), *Shebedino* (planned in 4 kebeles), *Gorcha, Wonscho, Loka Abaya* (4 kebeles in woyena dega)	Ongoing and planned projects in selected kebeles of the 6 Woredas	Selected villages within the kebeles
	PIN (People in Need)	PIN (office in Hawassa)			
	Water Aid				
	Water Action				
	Plan Ethiopia	Plan Ethiopia (Office in Hawassa)	Shebedino, Gorcha		
	SNV (Netherlands Development Association)	SNV South Portfolio (Office in Hawassa)	Dale Woreda (planned)		
	GOAL Ethiopia	Goal (Office in Hawassa)			
Private sector	Hydro-geological companies				
	Drilling & construction	Construction companies			
	Suppliers of spare parts	Suppliers of spare parts			
Educational and training institutions	Universities and colleges	Universities and colleges			
		TVETs			
Beneficiaries and their representatives				WASHCOs (not a legal entity, not considered part of the private sector)	
				Water users, Community Health agents	

4.2.2 Governmental and semi-governmental institutions

Ministry of Water and Energy Resources

The Ministry of Water and Energy of Ethiopia is a federal organization established to undertake the management of water and energy resources of Ethiopia. This involves development, planning and management of water and energy resources, development of polices, strategies and programs, development and implementation of water and energy sector laws and regulations, conducting studies and research activities, providing technical support to regional water and energy bureaus and offices and signing international agreements. Detailed mandate of the Ministry is contained in Proclamation 147/2000 (see section Legal and Regulatory Framework above). The organization structure of the Ministry is provided in Annex W.

The Ministry is the line Ministry for the project and a key strategic partner at the National (policy) level with the *Directorate Water Supply and Sanitation as the focal point for this project.* The Director is also the Head of the NWTC and Secretary for the National WASH Steering Committee.

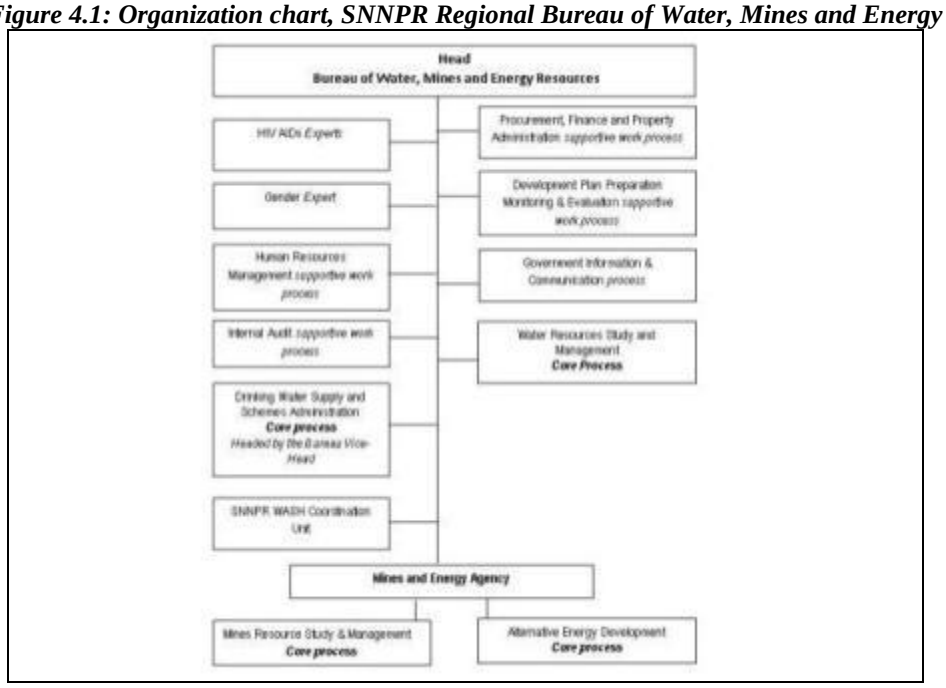
The Regional Bureau of Water, Mines and Energy

The Bureau is the regional organization established to undertake the management of water, mines and energy resources in the SNNPR. Particularly relevant for the project are the following functions:

- Development, planning and management of regional water and energy resources, development of regional polices, strategies and programs, development and implementation of regional water and energy sector laws and regulations, conducting studies and research activities, providing technical support to zonal water Department and Woreda offices and signing regional agreements.
- The Bureau has established regional WASH Coordination Unit and is hosting the Regional WASH Coordination Office (Refer sections 3.6.1 and 3.6.2)

The Bureau is the line Bureau and key strategic partner for this project at the regional (policy and strategy) level and the "entry point" to the SNNPR. Sections of direct relevance include: *Drinking water supply & schemes administration core process* (for overall coordination), *SNNPR WASH Unit* (inter-sector coordination at the operational level) and *Alternative energy development core process* (for proposed piloting of solar energy to be used for water lifting in the administrative centre of Loka Abaya)

Figure 4.1: Organization chart, SNNPR Regional Bureau of Water, Mines and Energy

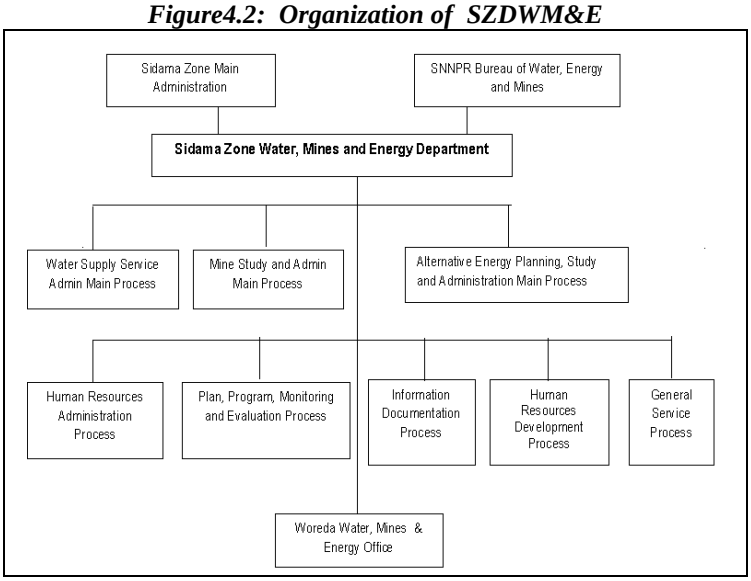


Sidama Zone Department Water, Mines and Energy (SZDWM&E)

The Zonal level is currently not included in the WASH Coordination system but is envisaged in the draft WIF, April 2011. The current role of the Zonal Department of Water, Mines and Energy is implementation support including support to procurement, support to WWTs and monitoring and reporting implementation of WASH program.

The Department is the line Department for this project and an important project partner at the operational level. It forms the link between the Woredas and the regional authorities and has a comprehensive understanding of water situation in the Sidama zone.

Figure4.2: Organization of SZDWM&E



Woreda Water Offices
Woreda Water Offices, staffed with head and varied number of technical staff exist in all proposed priority woredas. They are the lowest organization with technical competence to construct low cost WSSs. They also have (very low) budget for and can provide technical support to the WASHCOs in O&M.

Ministry of Mines, Geological Survey of Ethiopia
The Department for Ground Water Assessment. Focus is on regional assessments; to date, 28% of the country is covered by 1:25000 maps. The assessments are phased on the basis of needs. Sidama is included in the future plan (Dilla and Hossana sheets will include Sidama).Proposal has been submitted to the GOE, release of the matching fund is expected within a month. Regional hydro-geological mapping is scheduled to start in January 2012 and will be implemented in phases: Phase I: Desk study (bore holes, springs, HDWs, remote sensing). Estimated duration: 2 months. Phase II: Field work expected to take 3-4 months. Phase III: Office work including data processing, producing map and report. Estimated duration: 3 months. The maps and report for Sidama are expected by the end of 2012. Content of the maps: Aquifer potential (water table, confined); resource assessment; water quality; proposal for detailed investigations.

According to information provided by the Department, Sidama is mainly volcanic rock with active recharge and as long as detailed hydro-geological and geophysical investigations are conducted, the drilling success rate can be 90%.

The Department also conducts, jointly with the Geo-hazard Investigation Department, detailed hydro-geological assessments and hydro-chemistry that serve as the basis for recommendations on types of water use. Major projects:

- Hydrogeology of Upper Dawa Basin (includes Sidama) (document no 880-701-08)
- Water Investigation and production drilling in Sidama (880-701-01)
- Hydrogeology of the town of Hossana (880 -451 -25)
- Hydro-geology of Lakes Region (880-051-16)

Cooperation between the Department and MOW&E: The Department generates data; the MOW&E follows on developmental issues. Actual average long-term water consumption per inhabitant, cattle are estimated at 25 – 50l/day

The Department of Drilling Services reported a capacity to drill up to 500 m and up to 100 m respectively.

National Construction Authority (NCA)
The National Construction Authority is working as a contractor for water supplies. It includes 3 drilling teams, construction teams (who take over from the drilling teams after the completion of drilling works) and a sanitation and hygiene team. It is equipped with 3 drilling rigs for shallow wells (40-90m) that are usually fitted with a hand pump. Selection of sites is usually done by the NCA hydrogeologist together with Kebele leaders and the Woreda Water Office. Sanitation and hygiene promotion activities include community mobilization that is implemented jointly with the Woredas. The team works closely with the HEWs and trains health agents – community based volunteers/farmers. NCA also provides training in O&M to the WASHCOs; usually 2 people are trained. On technical aspects beyond the capacity of the WASHCO technicians, NCA trains the Woreda Water Office staff. Completed schemes are handed over to the RBWM&Es on the basis of an Agreement.

4.2.3 WASH coordination

The Regional Government of SNNPR is committed to fulfilling Target of the Millennium Development Goals, reducing by 50% the proportion of the population without access to water and sanitation by the year 2015. To achieve that, the Region follows the country-wide adopted integrated approach to water, hygiene and sanitation (WASH); there is a desire to establish a harmonious working modality among the BOWME, BOH, BOFED, BOE, and other partners active in the implementation of water supply, sanitation and hygiene education activities.

The strategy to WASH integrated approach is reflected and has been formalized in the *Memorandum of Understanding among SNNPR Bureau of Water, Mines and Energy, SNNPR Bureau of Health, SNNPR Bureau of Finance and Economy Development and SNNPR Bureau of Education on The Implementation Modality for Integrated Water Supply, Sanitation and Hygiene Education (WASH) Programs in SNNPR was* signed in December 2010 in Hawassa. The MOU explains that the purpose of bringing the partners together is to facilitate cooperation in joint planning, implementation and monitoring of water supply, sanitation and hygiene education (WASH). It provides in detail the rationale behind and the benefits of the integrated approach and describes:

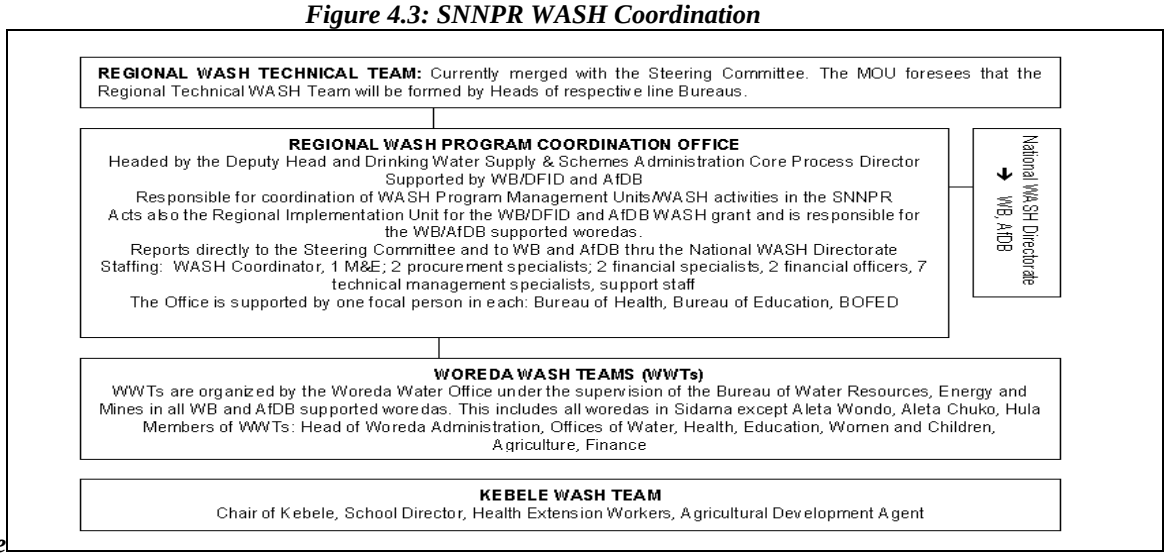
- The major areas of cooperation: Water supply; human waste management; water supply and sanitation for schools and health institutions; water quality control and surveillance; sanitation/hygiene promotion and hygiene education (personal hygiene, safe water chain, safe disposal of faces).
- Roles and responsibilities of the partners – signatories of the MOU

- Roles of financing institutions and other donors as WASH development partners
- Coordination structures

Structures, roles and responsibilities of partners at Woreda level are described in detail in Appendix A to the MOU. This includes the Woreda Steering Committee, Woreda WASH Team (WWT) (also referred to as the Woreda Technical Committee).

The coordination structure is governed by the MOU on the Integrated Implementation Modality of Water Supply, Sanitation and Hygiene, 2006. This section is based on the MOU complemented by discussions with staff from the National WASH Coordination Office.

Figure 4.3: SNNPR WASH Coordination



Structure

The WASH Coordination Office has the overall responsibility for coordinating WASH activities in SNNPR and is the Coordination Office for the WASH Project Management Units (PMUs)/focal persons in the relevant Bureaus. (Currently a PMU has been established in the Bureau of Water, Mines and Energy Resources). For improved coordination, the Office aims to incorporate UNICEF in the MOU to strengthen coordination of donors. The Office also plans to strengthen coordination of NGO and other non-state actors.

At the Woreda level, Woreda WASH Teams (WWTs) have been established with the support of WB/DFID, AfDB and UNICEF. 2 WWTs are foreseen in each Woreda: 1 urban, 1 rural. Of the134 rural Woredas in SNNPR, WWTs have been organized in 46 with the support of WB/DFID, in 24 with the support of AfDB and in 20 with the support of UNICEF. The Regional Government plans to organize WWTs in the remaining 44 Woredas[21]. From the proposed priority Woredas, WWT has been formed in Loka Abaya and has yet to be formed in Aleta Chuko. 17 urban areas have been supported by WB/DFID in establishing the Urban Water Management Board. The Board includes the mayor of the town (Head), water/waste water sector utilities, health, education, municipality; it manages WASH program in the town.
In Sidama zone, WWTs are established in all Woredas except for Aleta Wondo, Aleta Chuko and Hula. In Loka Abaya and in Hawassa Zuria only rural WWTs have been set up. Establishing WWTs for the remaining Woredas is planned.

The Zonal level is currently not included in the WASH Coordination system but their direct involvement is foreseen in the near future and it is also envisaged in the draft *National WASH Implementation Framework, April 2011.* The current role of the Zonal Department of Water, Mines and Energy is implementation support including support to procurement, support to WWTs and monitoring and reporting implementation of WASH program.

The draft WIF also includes detailed proposal for the structures and functions of the WASH coordination systems at the Woreda as well as Kebele levels where no such structures currently exist. The Framework also provides detailed proposal for WASHCOs including structure and mandate.

There is a scope for further improvement of coordination, convergence of plans and activities and a MIS encompassing the WASH sector.[22] Currently, there is no systematic information on NGO WASH activities but there is an understanding of the need for and recognition of their contribution. The RBWM&E/Regional WASH Coordination Office advised that closer cooperation and coordination with NGOs is foreseen. The Woredas do not

[21] The draft WIF proposes WWT to be established in each Woreda. The mission is not aware of funding sources.

[22] Completion of the WASH Inventory and establishment of consolidated and up to date MIS will improve the situation The draft WIF includes detailed proposal for strengthened coordination in planning, implementation and monitoring.

(yet) have the capacity to improve WASH services to support sustainability and to increase coverage at the rate foreseen in draft UAP 2.
The Regional Bureaus, Zonal Departments and Woreda Offices have limited capacity in terms of HR, funds and logistics. The assessment team is of the view that the current capacities would need further strengthening if they were to manage the funds and to implement the proposed project.

4.3 Drinking water coverage

Provision of access to clean water supply in Ethiopia has increased from 23% to 35% in rural and from 74% to 80% in urban areas during the period 2001/02 to 2004/05 according report issued by the Ministry of Finance[23]. It should however be noted that SNNPR and specifically Sidama zone has not been the main focus of water and sanitation activities in the past. Water and sanitation coverage in SNNPR is among the lowest in the world leading to high morbidity and mortality rates among the public in General, and children, women and the elderly in particular. Early 2011, the SZDWM&E collected secondary data from the 21 Woredas/towns on actual water access coverage (excluding non-functional schemes). According to this compilation, the average for Sidama Zone is 39%, for the rural Woredas about 33%.[24]

Currently the GOE is implementing a National WASH Inventory using a comprehensive questionnaire. More systematic data allowing comparison between zones and regions will be available once information from the Inventory is published (the time frame is before the end of 2011). Given the complexity of gathering and updating data on rural water supply schemes and their functionality and the fact that a comprehensive MIS is yet to be put in place, the numbers and percentages may for the time being be considered as indicative.

Table 4.2: Access to drinking water in Sidama

#	Woreda	Rural Population	Number of water supply schemes										Rural popul. served	Access (%)	Popul. not served
			HDWs with hand pump		SW with hand pump		DWs with distribution		Springs with distribution		Spot springs				
			FN	NF	FN	NF	FN	NF	FN	NF	FN	NF			
	SIDAMA RURAL	**3,030,131**	**206**	**39**	**398**	**48**	**67**	**0**	**4**	**0**	**1,206**	**73**	**1,075,891**	**35.51**	**1,954,240**
1	Shebedino	198,928	20	3	43		19				58	3	109,426	55.01	89,502
2	Hawasa Zuria	146,200	12	2			1		1				38,986	26.67	107,214
3	Arbegona	143,758	5				2				80	5	36,706	25.53	107,052
4	Dale	192,533	49	5	66	12	6				84	6	100,524	52.21	92,009
5	Aleta Wondo	174,366	29	8	61	3	1				121		83,449	47.86	90,917
6	Dara	151,877	7	4	3		5				184	8	85,802	56.49	66,075
7	Hula	127,687			22	8	2		1		146		69,759	54.63	57,928
8	Bensa	275,537	5		36		4		1		92	12	62,635	22.73	212,902
9	Aroresa	177,815	11	2	9	3					63		25,108	14.12	152,707
10	Boricha	247,467	6	1	6	2	5						62,746	25.36	184,721
11	Gorchie	146,084									70	9	26,702	18.28	119,382
12	Malga	119,172	27	6	1		1				53		30,594	25.67	88,578
13	Wensho	126,096									34	3	15,622	12.39	110,474
14	Loka Abaya	103,690	7	2	32	5	4						32,591	31.43[25]	71,099
15	Chire	119,573									15		24,773	20.72	94,800
16	Bursa	105,179	3		11	4	1				49	15	32,610	31.00	72,569
17	Chuko	179,409			101	11	14				10	2	101,622	56.64	77,787
18	Bona Zuria	134,564			6		2				113	10	50,942	37.86	83,622
19	Wondogenet	160,196	25	6	1				1		34		85,294	53.24	74,902

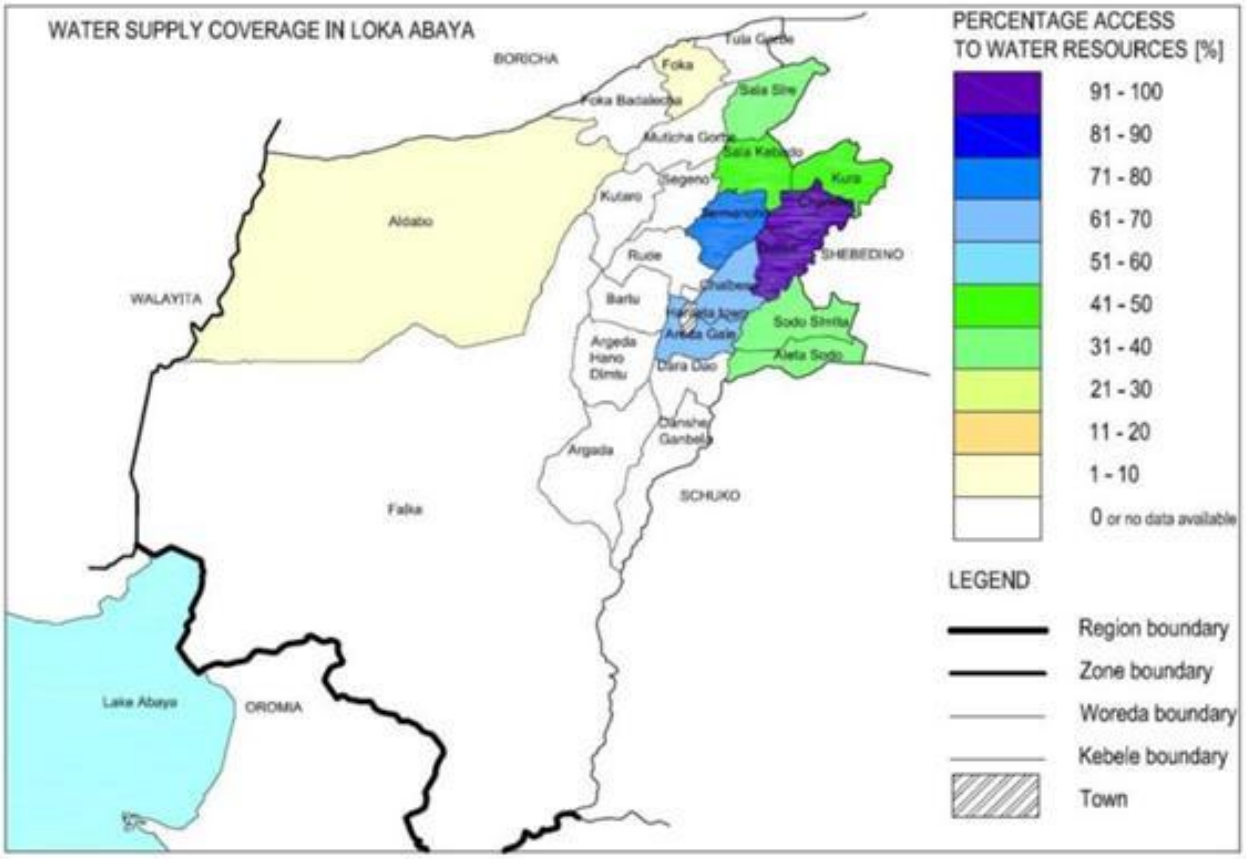
Source: SZDWM&E March 2011
Notes: Water access includes only WSSs that were reported by the Woredas as functional in the time of data gathering. FN=functional, NF=not functional.

23 Ethiopia: Building on Progress: A Plan for Accelerated and Sustainable Development to End Poverty (PASDEP), 2009

24 Water supply schemes in Ethiopia are officially divided in to 3 categories: functional, not functional but repairable, not functional and not repairable. The GOE official figures are based on functional + repairable unless specified otherwise.

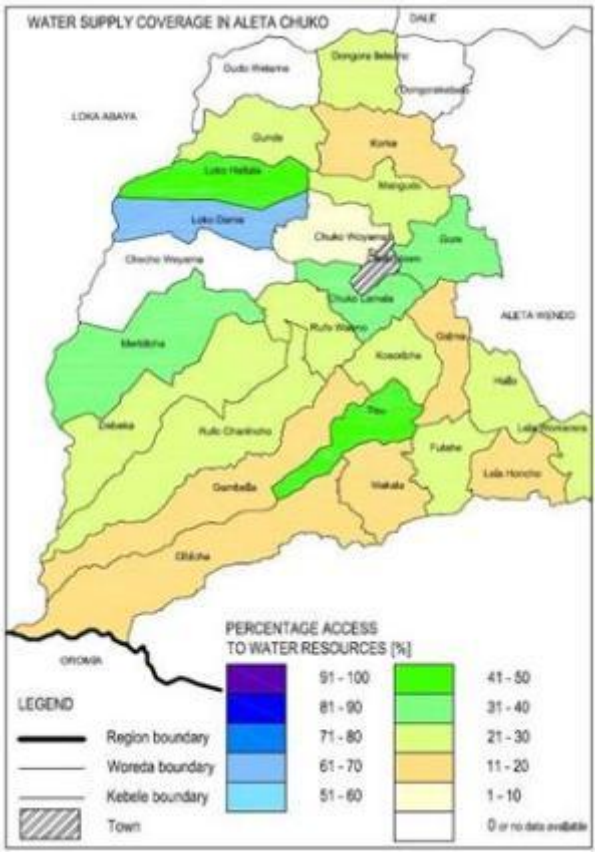
25 Data provided by Woredas are even lower than those provided by SZDWM&E.

Map 4.5: Water supply coverage in Loka Abaya



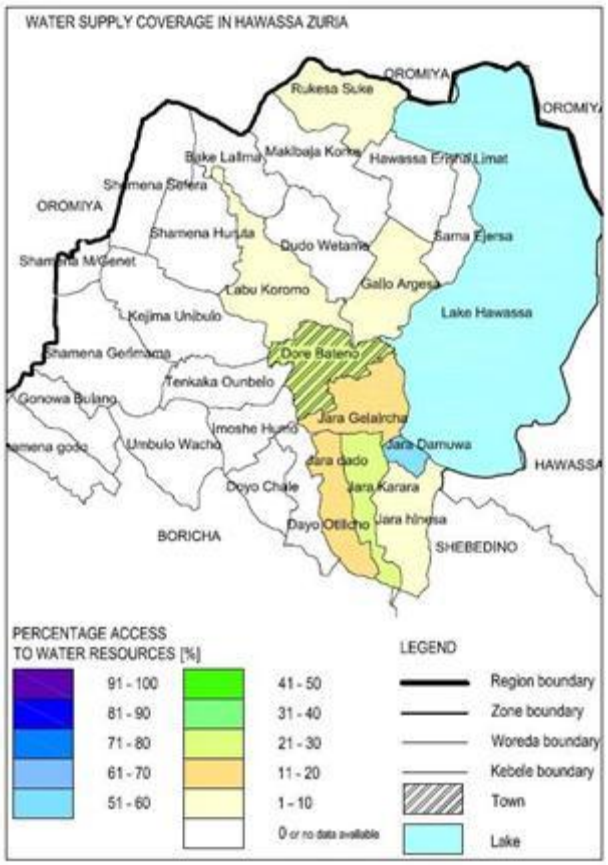
Source: produced by consultant on basis of access data provided by the Woreda

Map 4.6: Water supply coverage in Aleta Chuko



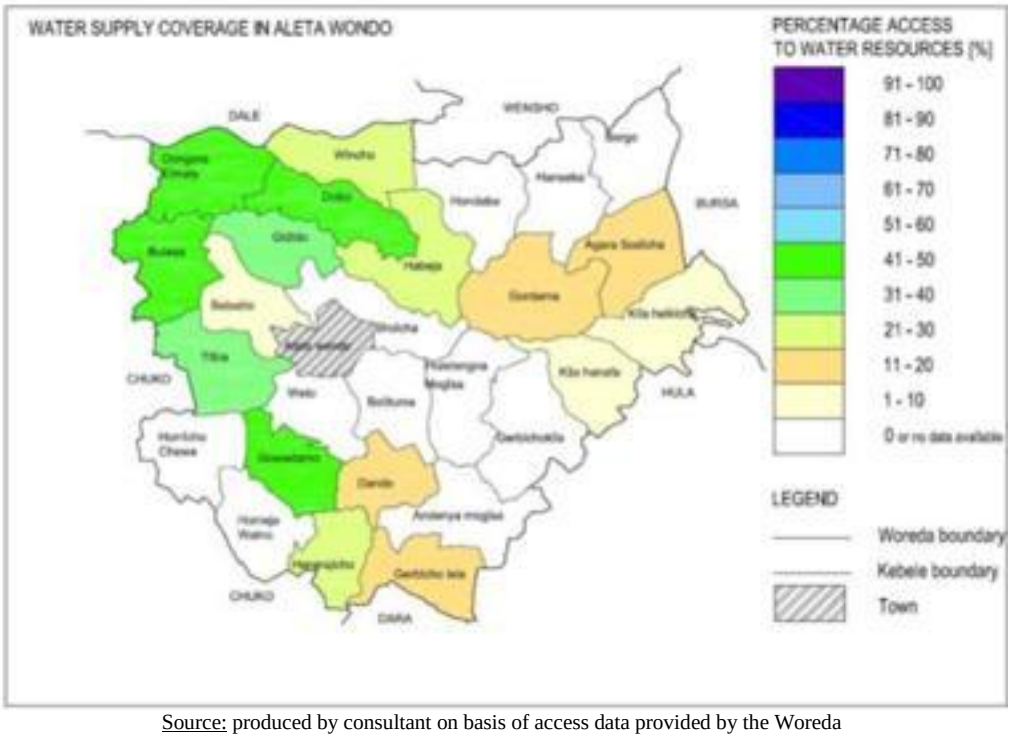
Source: produced by consultant on basis of access data provided by the Woreda

Map 4.7: Water supply coverage in Hawassa Zuria



Source: produced by consultant on basis of access data provided by the Woreda

Map 4.8: Drinking water coverage in Aleta Wondo



Source: produced by consultant on basis of access data provided by the Woreda

5 ASSESSMENT QUESTIONS: FINDINGS AND RECOMMENDATIONS

5.1 Scope

5.1.1 Consensus on proposed priority Woredas

Scope of proposed interventions and consolidation of proposed priority Woredas was discussed during the introductory meeting held with the Regional Bureau of Water, Mines and Energy (RBWM&E) and the Sidama Zonal Department of Water, Mines and Energy (SZDWM&E) in Hawassa on 13 June 2011 (signed Summary attached in Annex H).

There has been a discrepancy between the Woredas stipulated in the mission's TOR (Aleta Wondo, Aleta Chuko, Hawassa Zuria and Hula) and those mentioned by the Sidama Zonal Department (Hula, Aleta Wondo, Bensa and Bona Zuria). It has been clarified that while Bensa and Bona may be included in a different proposed CDA project, the four Woredas in the TOR have indeed been previously agreed as proposed priorities for CDA support for rural water supplies in the Sidama zone.

The regional government representatives explained that In Hula Woreda, cooperation on rural water supplies has meanwhile been agreed with the World Vision and proposed replacing Hula by Loka Abaya. Justification provided by the regional and zonal government representatives for proposing Loka Abaya as a priority is (i) low coverage – (only 28.3% of population have access to drinking water supplies; average for Sidama is 39.9% [26]) and (ii) low presence of NGOs/donors constructing water supply systems.

It has been agreed that the consultant team visits and assess the situation in Aleta Wondo, Aleta Chuko, Hawasa Zuria and Loka Abaya. In addition, the consultant would also visit two neighboring Woredas: Hula (which is included in the TOR) to discuss with the Woreda administration and technical Offices and Shebedino to meet with the Woreda Office for Water, Mines and Energy and to visit a scheme for rural water supply powered by solar energy (designed and being constructed with the support of Plan Ethiopia).

5.1.2 Narrowing the scope

As the Tables 5.1 and 5.2 below illustrates, the proposed Woredas are relatively large in terms of numbers of Kebeles (the lowest administrative unit, each of which includes a number of villages). Numbers of population without access in each Woreda exceeds 70,000.

Information for the tables was provided by two different sources and validity of the data is questionable – more accurate data are expected after the publication of the WASH Inventory now under preparation. Both Tables however show almost same numbers of population as well as similar trends in the coverage with lowest in Hawassa Zuria, followed by Loka Abaya and Aleta Wondo, with relatively highest coverage in Aleta Chuko.

Matrices in Annex O compiled by the respective Woreda Technical Offices include break-down to Kebele levels and illustrate access to water and sanitation services in detail. Information from these matrices served as basis for preparing Maps 4.5 – 4.8 showing levels of access in deciles.

Table 5.1: Kebeles, population and access to water in the proposed Woredas

#	Woreda	Number of Kebeles	Population	Access to Water supply		Population without access
				Population	%	
1	Hawassa Zuria	23	139,520	7,620	5.46	131,900
2	Aleta Wondo	27	187,054	49,850	26.65	137,204
3	Loka Abaya	25	103,737	24,334	23.46	79,403
4	Aleta Chuko	26	179,871	51,750	28.77	128,121

Source: Information provided by the Woredas during field visits in June 2011

[26] Information provided by the Regional Water Bureau in the introductory meeting with the mission on 13 June 2011

Table 5.2: Population, water supply schemes and access in the proposed Woredas

#	Woreda	Population	Number of water supply schemes										Population served	Access coverage (%)	Popul. not served
			HDWs with hand pump		SW with hand pump		DWs with distribution		Springs with distribution		Spot springs				
			FN	NF	FN	NF	FN	NF	FN	NF	FN	NF			
	SIDAMA RURAL	**3,030,131**	**206**	**39**	**398**	**48**	**67**	**0**	**4**	**0**	**1,206**	**73**	**1,075,891**	**35.51**	**1,954,240**
2	Hawasa Zuria	146,200	12	2			1		1				38,986	26.67	107,214
5	Aleta Wondo	174,366	29	8	61	3	1				121		83,449	47.86	90,917
14	Loka Abaya	103,690	7	2	32	5	4						32,591	31.43	71,099
17	Aleta Chuko	179,409			101	11	14				10	2	101,622	56.64	77,787

Source: SZDWM&E, 2011
Notes: FN = functional, NF = Not functional

The consultant concluded upon technical, socio-economic and feasibility assessments that reducing the scope to 2 Woredas would significantly increase effectiveness and efficiency as well as visible impact of the proposed project. (Details of assessment are provided in Table 5.3 below). The following guiding principles and criteria were used to assess the four Woredas and to narrow down the recommended selection:

- *Demonstrated perceived need/pro-active demand – contributes to likelihood of sustainability*

  The consultant's team was guided by the Woredas to visit kebeles/locations with lowest or no coverage. Based on information from semi-structured interviews with some of the potential beneficiaries, Kebele officials and HEWs who gathered for the meetings, as well as with the Woreda authorities, it has been concluded that perceived need is strongest in the lowlands of *Loka Abaya and Aleta Chuko*. The visited communities and Kebele representatives expressed willingness to contribute specified cash amounts to the constructions and to pay tariff that would sustain the O&M. They also made specific, constructive comments and suggestions related to O&M structures for and addressed some critical, unresolved issues.

- *Current levels of access*

  While information on actual access varies between sources, the trend is consistent with the lowest in *Hawassa Zuria followed by Loka Abaya, Aleta Wondo and Aleta Chuko.* The area is however densely populated and even 50% coverage can mean at least 80 to 90 thousand people without access.

- *Existing work of donor community complementing and creating a niche for the CDA interventions*
  WB/DFID, UNICEF and AfDB provide support to decentralizing WASH and to the formation of WWTs. This structure can be built upon and utilized by the proposed project. Of the four proposed Woredas, Aleta Wendo and Aleta Chuko (as well as Hula) have not been supported by either the WB/DFID or by the AfDB while Hawassa Zuria and Loka Abaya have established WWTs. Following the strategy outlined in the Technical Proposal, it is recommended to select one Woreda with existing WWT and one without; support to establishing a WWT would contribute to capacity building in WASH sector in the Woreda. Bringing the local stakeholders together in a consolidated manner from the onset of projects activities is seen as an added advantage.

- *Construction of water supply schemes and related WASH activities by NGOs and donors*

  Details are provided in Annex X. During discussions held with NGOs in *Hawassa,* the team was informed by GOAL Ethiopia plans to provide development support the WASH sector in Hawassa Zuria on a larger scale (GOAL has been providing emergency support in the past). This has been confirmed over the phone by the GOAL office in Addis Ababa; it is understood that the project will start soon. It has been agreed with the relevant zonal and regional authorities that overlaps and duplications are likely and Hawassa Zuria will therefore not be considered for the prposed project.

  In *Aleta Wondo*, Norwegian Church Aid, GOAL Ethiopia, and ACF are active in rural WASH activities including water supplies. WB/DFID plan improvements in the town.

  Aleta Chuko benefits from work of SC USA and Mekene Yesus. This support is however limited to a few kebeles.
  Loka Abaya benefits from work of SC USA in some midland areas. Mekene Yesus covers few unspecified locations.

- *Technological requirements*
  NGOs working in the project area are usually focused in low investment cost, low O&M requirements water supply technologies. There is a niche for the proposed project to provide technical competence and funding for underserved areas where low cost technologies do not represent the sustainable

solutions. In particular in the lowland areas with dry hot climate and unreliable rains, wells, springs or hand dug ponds can dry out and/or are not an option.

Results from assessment of the proposed Woredas against the above criteria are summarized below. The assessment is based on consensus among the 3 consultant's team members. Three grades have been used for ranking with 3 being the highest, 1 the lowest grade. Support to formation and capacity building of WWTs has not been ranked because of the recommendation to include one Woreda with WWT and one without.

Table 5.3: Prioritizing four proposed Woredas for narrowing down the scope

Woreda	Summary of assessment	
Hawassa Zuria	• Demonstrated need, demand and willingness to cash contributions assessed as relatively low. • The Woreda has of the four prioritized lowest access; water tankering during dry season. • It has received capacity building support from the WB/DFID project and has an established WWT • GOAL Ethiopia plans intervention in WASH including water supplies to start soon; there is a potential danger of overlaps and duplications. SOS Sahel and the Mendel University have also small projects in the Woreda. • Technology requirements: mainly shallow and deep wells and springs with gravity distribution	1 3 - 1 3 **8**
Aleta Wondo	• Demonstrated need, demand, willingness to cash contributions and tariff payments and pro-active attitude to organization and management assessed as higher than in Hawassa Zuria but lower than in Aleta Chuko or Loka Abaya. • Ranks 3rd in terms of access • No capacity building support for WWT • Several NGOs work in the WASH sector, WB/DFID plan to improve the town water supply system. Anticipated visible impact of proposed project not high. • Most of the area lies in midlands where low investment cost and low O&M technologies are more likely to be appropriate, some 30% in lowlands	2 1 - 1 3 **7**
Loka Abaya	• Demonstrated demand, willingness to contribute cash to investment and to pay tariffs; specific ideas for setting up effective O&M. • Second lowest access • Received capacity building support from WB/DFID and established WWT which can be built upon by setting up organization and management. • NGO interventions low • 83% of the Woreda is situated in lowlands, 17% in midlands. There are prolonged droughts and low cost low maintenance technologies provide water for only part of the year. Water tankering to 9 Kebeles.	3 2 3 3 **11**
Aleta Chuko	• Demonstrated demand. Expressed willingness to contribute specified cash amounts to the constructions and to pay tariff that would sustain the O&M. Specific comments and suggestions related to organization and management structures for improving sustainability. • Current level of access relatively higher than the remaining 3 Woredas. • Has not received support from the WB/DFID project – no WWT. • Receives limited support from SC USA and Mekene Yesus • 75% lowlands, 25% midlands. Climate is dry in kola, rains are irregular	3 1 3 3 **8**

Based on the assessment, the consultant proposes Loka Abaya and Aleta Chuko as priority Woredas.

Selection of Kebeles/sites will be done by the proposed project with the support of the SZDWM&E, jointly with the Woreda administration and technical Offices, the Kebeles and potential beneficiaries/ their representatives.

5.1.3 Consensus on scope and phased approach

Within the allocated time, physical survey and discussions with stakeholders in areas proposed for CDA interventions had to be limited to one Kebele in each Woreda. The consultant has presented (in the form of .ppt) and discussed major findings and recommendation including those pertaining to narrowing down the scope in debriefings with the SZDWM&E, the RBMW&E as well as with the MOW&E to obtain comments, suggestions and second opinion from people familiar with the proposed project area.

Debriefing SZDWM&E (Presentation attached in Annex I, Summary in Annex J)
The team's proposal to *focus on 2 Woredas* for better effectiveness *has been discussed and accepted.*
The selection of priority Woredas has been discussed at length. Aleta Wondo and Hula were tabled by the Department as possible options to proposed Aleta Chuko. The team explained rationale behind proposing Loka Abaya and Aleta Chuko: need in the low lands is difficult to cover with low cost technologies available to the Woredas and NGOs. Loka Abaya and Aleta Chuko demonstrated readiness to cooperate. *It has been agreed*

that Loka Abaya and Aleta Chuko will be proposed as priorities; Hula will be kept as "reserve" – priority no. 3, and may be included at a later stage subject to availability of resources.

The Head of the Department informed that a major gravity scheme (*Awada Boricha)* originating in Yirga Alem and planned to stretch over several Woredas has been under implementation for the last five years. The scheme is expected to also cover some Kebeles in Loka Abaya and should be considered by the proposed project.

Debriefing RBWM&E (Presentation attached in Annex K, signed summary in Annex L)
Narrowing scope to Loka Abaya and Aleta Chuko After an extensive discussion of the criteria and selection, the rationale of the team for *proposing Loka Abaya and Aleta Chuko with Hula in reserve has been accepted. Integrated approach:* The regional and zonal government representatives stressed the need for an integrated approach, incorporating interventions related to: (i) Safe excreta disposal, (ii) hand washing and (iii) safe management and treatment of water in the project design.

Debriefing MOW&E (Presentation attached in Annex E, signed summary in Annex F)
The presented *proposed scope* including Loka Abaya and Aleta Chuko with Hula in reserve has not been commented upon and *is considered as accepted*. The Director, Water Supply and Sanitation, stressed the need for *covering schools and health institutions by water supply* as much as technically possible. The institutions would need to pay tariff as agreed by the community.

5.1.4 Conclusions

1. *It is recommended to narrow the scope to two Woredas, Loka Abaya and Aleta Chuko, with Hula in reserve. Assumption:* MOU will be signed and implementation will start soon (before mid 2012); other donors/NGOs will not occupy the niche identified for CZDC.

2. It is recommended that the project follows in both proposed priority Woredas the *integrated WASH approach*. *Assumption*: This approach is acceptable to the CDA.

3. It is recommended to *extend distribution systems to schools and health institutions*. *Assumption:* it will be technically possible

5.2 Relevance of potential DC CZ interventions in proposed Woredas

5.2.1 Access to safe drinking water in Loka Abaya and Aleta Chuko

Matrices in Annex O provide a summary of the status of water supply and sanitation for the four initially proposed Woredas including the two priority Woredas agreed with SZDWM&E, the Regional WASH representatives and the MOW&E. The matrices were compiled by the respective Woreda Technical Offices and include break-down to the Kebele levels, illustrating access to water and sanitation services in greater detail. The information has not been checked on validity and comprehensiveness and there are gaps in the data. The population numbers and trends in coverage are however consistent with information provided by the SZDWM&E.

While the SNNP Region is located in southern part of Ethiopia and belongs mostly to Western highlands and the average altitude in Sidama is 2032 m a.s.l.[27] there are areas in Aleta Chuko, and more so in the neighboring Loka Abaya that are situated in kola areas (as can be seen in Map 4.2) where traditional sources are distant and construction of low cost, low maintenance WSSs may not be possible or often dry out during the dry season. There are no dega[28] areas in neither of the two Woredas. An overview of access to improved water supply for the two Woredas is provided in Tables below.

[27] Central Statistical Agency, Atlas 2009, First draft, Volume 7 SNNP Regional State

[28] Dega – an altitude in meters from 2300 to 3200

Table 5.4: Kebeles, population and access to water in Loka Abaya and Aleta Chuko

Woreda	Number of Kebeles	Population	Access to Water supply		Population without access	
			Population	%	Number	%
Loka Abaya	25	103,737	24,334	23.46	79,403	76.54
Aleta Chuko	26	179,871	51,750	28.77	128,121	71.23
Total		**283,608**	**76,084**	**26.82**	**207,524**	**73.18**

Source: Information provided by the Woredas during field visits in June 2011

Table 5.5: Population, water supply schemes and access in Loka Abaya and Aleta Chuko

Woreda	Population	Number of water supply schemes										Population served	Access coverage (%)	Population not served
		HDWs with hand pump		SW with hand pump		DWs with distribution		Springs with distribution		Spot springs				
		FN	NF	FN	NF	FN	NF	FN	NF	FN	NF			
Loka Abaya	103,690	7	2	32	5	4						32,591	31.43	71,099
Aleta Chuko	179,409			101	11	14				10	2	101,622	56.64	77,787
Total	**283,099**											**134,213**	**47.41**	**148,886**

Source: SZDWM&E, 2011 Notes: FN = functional, NF = not functional

While the difference in numbers of population is only minor, the numbers on coverage widely differ, with much lower coverage reported by the Woredas. This can be due to missing information or the Woreda under-report because they do not want their allocation for WSSs to be decreased. The available information indicates that some 150,000 to 200,000 people (or 53% to 73% of the population) in Loka Abaya and Aleta Chuko have currently no access to safe drinking water.

The above illustrates that the proposed project is relevant and can increase access to safe drinking water to some 80,000 people increasing the coverage in the two Woredas to some 65%.[29]

5.2.2 Topography of Aleta Wondo and Loka Abaya

As mentioned in other sections of this report, low-cost engineering solutions may not be appropriate and/or sustainable in lower elevations. The Map below shows the elevations in Loka Abaya and Aleta Chuko Woredas. According to the respective Woredas administrations, some 83% of Loka Abaya and about 75% of Aleta Chuko are situated in *kola*[30].

The proposed project is justified possibly also in terms of complementarities to engineering solutions currently used in the two Woredas and particularly relevant for communities located in lower elevations.

5.2.3 Interventions by other donors

Loka Abaya and Aleta Chuko receive relatively less support from NGOs (donors do not construct WSSs in the Zone) than other Woredas. Annex X provides an overview on NGO and donor activities in the 20 Woredas in Sidama Zone (Hawassa town is not included).

Information from the Annex indicates that only two NGOs work on water supplies in each of the Woredas:
Aleta Chuko: SC USA, Mekene Yesus; Loka Abaya: SC USA, Mekene Yesus

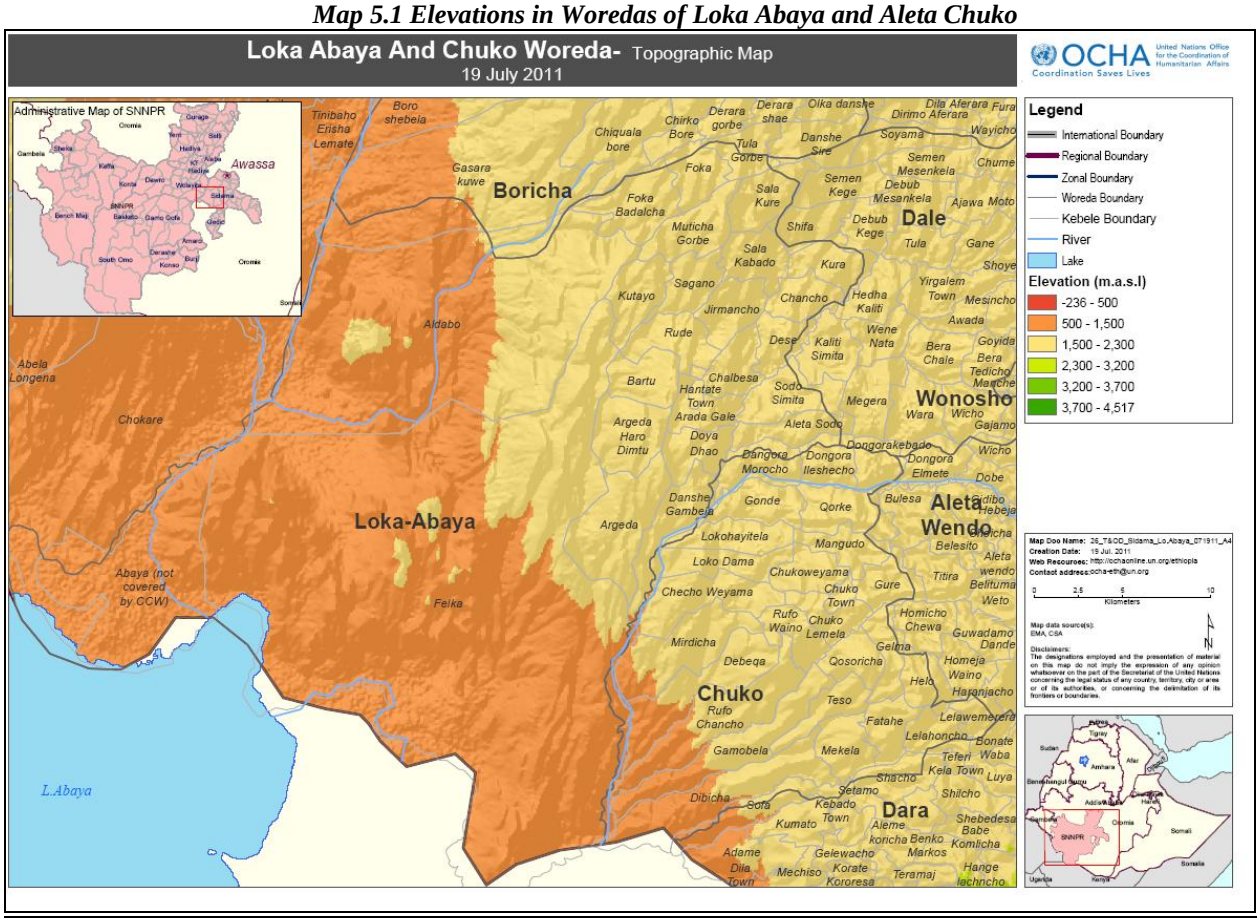
The consultant is not aware of any plans for future interventions in water supplies/ construction of WSSs. The Woreda, Zone and Region did not provide any additional information or information to the contrary.

The available information documents that current activities by NGOs in water supplies in both Aloka Abaya and Aleta Chuko are limited and that there are currently not any known plans for such activities. SC USA works in woyena dega. Locations and technical solutions used by Mekene Yesus could not be established during the mission.

[29] Calculated on the basis of government norm for average coverage by type of source assuming some 20 new installations

[30] Kola – an altitude in meters from 500 to 1500

Map 5.1 Elevations in Woredas of Loka Abaya and Aleta Chuko



Source: UNOCHA Ethiopia, 19 July 2011

5.3 Feasibility

5.3.1 Technical feasibility

Geological and hydrogeological conditions[31]

Ethiopia is a country with a broad range of geomorphic provinces (see picture below): a high mountainous core—cut by deep gorges and incised river valleys, fault-bound plateaus and basins, a prominent rift valley that hosts a number of lakes, and bordering plains that range from the harshest of deserts to subtropical jungles. Elevations range from 4620 m above s.l. at Ras Dashen to 110 m below a.s.l.. in the Afar depression.

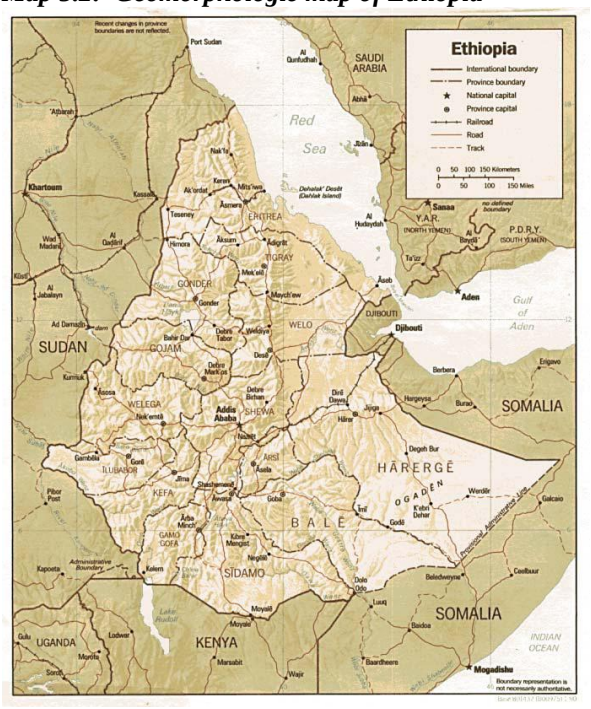
In terms of their surface exposure, the main lithologic units of the country have been grouped in:

- Precambrian metamorphic basement rocks (cover about 23% of the surface of the country).
- Mesozoic sedimentary rocks (cover about 25%)
- Tertiary volcanic rocks—largely flood basalts— (cover about 25%)
- Quaternary volcanic rocks—largely ignimbrites—and sediments (cover about 17%)

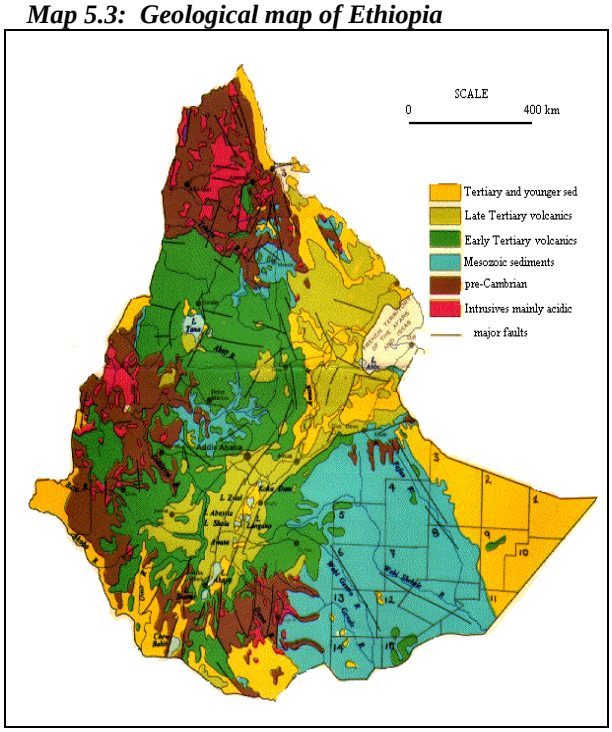
As a mountainous country, Ethiopia receives a significant amount of rainfall in the highlands and even in the arid areas rainfall can be used as a direct water resource if efficiently harvested and properly stored. At a broader scale, the abundant rainfall feeds the groundwater system and streams that go from small seasonal rivulets to the big river. The main problem of the country, which has been dubbed “the water tower of Africa”, is no shortage of water but the reason that most of this water evaporates, runs away as stream flow, or is stored beyond reach in aquifers depending on the regional geological structures.

31 *Compiled using the document: Development and management of water resources, Horacio Ferriz and Gebeyehu Bizuneh*

Map 5.2: Geomorphologic map of Ethiopia

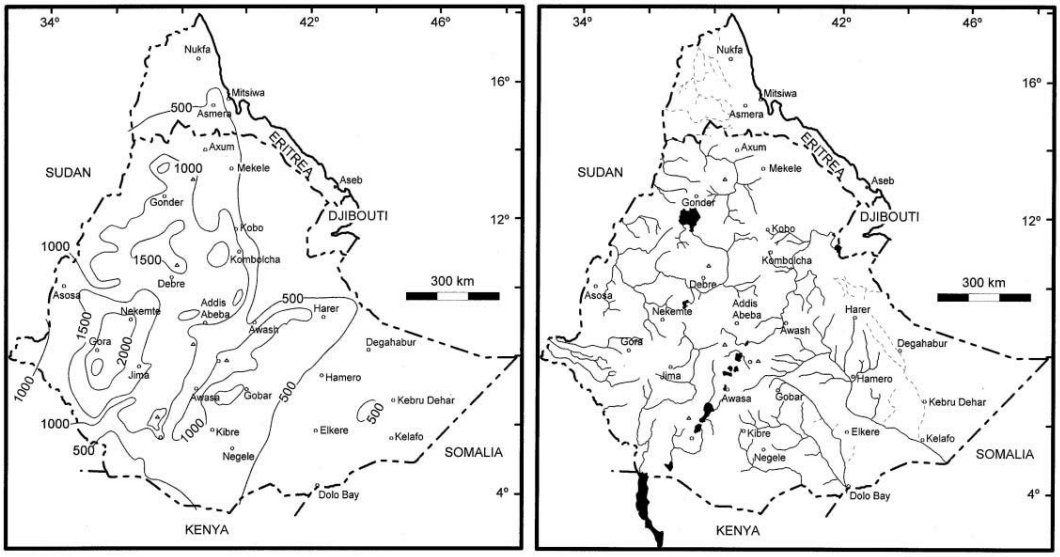


Map 5.3: Geological map of Ethiopia



Source: Hydrogeological map of Ethiopia: Ethiopian Institute of Geological Surveys. Map, scale of 1:2,000,000, Chernet, T., 1988

Map 5.4 and 5.5: Contours of mean annual precipitation in Ethiopia, in mm. Main Rivers (bold lines) and dry washes (thin lines) of Ethiopia. Lakes are shown in solid black, and triangles indicate major mountain peaks.



Modified from Hydrogeological map of Ethiopia: Ethiopian Institute of Geological Surveys. Map, scale of 1:2,000,000, Chernet, T., 1988

Groundwater development in the Precambrian metamorphic complexes is problematic. Fractured-rock aquifers exist within them, but in their shallow reaches can only produce very modest amounts of water, often barely sufficient to satisfy the drinking needs of small settlements. The deeper reaches of these aquifers could have higher yields, but exploration and deep drilling is more exacting.

The Mesozoic sequence is much more promising in terms of groundwater development, also springs are often found at the contact between the Adigrat Sandstone and the Precambrian basement rocks, so this contact is a key exploration target. Concerning large-yield aquifers, the lime-stones of the Antalo Group are promising exploration target due to prominent secondary permeability and their stratigraphy, which is laterally continuous over relatively large distances. Unfortunately, the same characteristics that make the Antalo lime-stones a good target for groundwater exploration also make big problems in construction of artificial reservoirs due to the losses due to infiltration into the karstic substrate are so large that some reservoirs are at best seasonal recharge basins for the underlying aquifers.

The Tertiary flood basalts can be major sources of groundwater, which under some circumstances are easy to tap. For example, high-yield springs are common at the contact between the flood basalts and the Mesozoic rocks, and at the contact between individual lava flows. Furthermore, many springs are high enough above the valley floors that water can be delivered by gravity with relative ease. On the other hand, most springs have modest yields so they are not a viable alternative for larger settlements and extraction through wells is the only way which would undoubtedly afford higher yields. Groundwater excavation generating higher yields can be done by wells or horizontal galleries/wells. Driving galleries is not trivial, but water collected in galleries can be distributed by gravity (hence bypassing the need for costly pumps and the energy needed to run them).

The aquifers hosted by the late Cenozoic volcanic sequence, dominated by ignimbrites and tuffs are not as "consistent" as those found in the flood basalts, although they too are in essence fractured-bedrock aquifers. The difference arises from the fact that columnar-jointed basalts have excellent vertical permeabilities, and the rubbly zones form laterally extensive water storage zones. In contrast, ignimbrites are not as extensive, their vertical permeability is not as high, and they do not have predictable zones for groundwater exploration (unwelded intervals of an ignimbrite would form excellent aquifers, but such intervals are not always present). Mostly, deep wells that intersect a good number of water-bearing fractures can have very good yields.

The Cenozoic sedimentary units are mostly the most promising groundwater resources and include alluvium-filled grabens, channel fills, and coarse sandstone and conglomerate layers interbedded with shales, contacts between clastic and chemical sediments, contacts between clastic sediments and inter bedded volcanic rocks and lava flows within lacustrine sedimentary sequences.
From above mentioned, alluvium-filled grabens has the highest groundwater potential for further development of the agriculture, because these valleys are scattered throughout the mid elevations of the country where most of the population lives. They are recharged every year by mountain streams, their water tables are shallow, and they are filled with coarse-grained alluvium with good hydraulic conductivities.

Water supply systems and technologies
Currently, in Sidama various water sources (such as ground water, spring and sometimes rainwater) are used with various water abstraction technologies. These sources and technologies are discussed further in the following sections.

Precipitation
Rainfall distribution patterns are strongly controlled by latitude and orographic relief, and vary from a high average value of more than 100 cm per year to a low of 10 cm per year (see above). Rainfall distribution is strongly seasonal, with the main" season is in winter (June to September), and the small rains /" season is in late autumn (March to May) and has the normal variability expected from a stochastic process (wet and dry years).

The lowest precipitation is prevalent in the arid regions of the country, which in consequence have an almost total absence of surface water (with the prominent exception of the large rivers that have their origins in the mountains—for example, the Omo River in the south or the Wabe Shebele in the east—or the lakes of the East African Rift).

Rainwater harvesting is the simplest of water development strategies, based on simple calculation (10 cm of rain, collected over a surface of 1 hectare would yield a total of 1,000 m3 and would be able to support a couple hundred people year round). But the main problem is storage of huge amount of collected water and especially subsequent contamination.

This fact significantly limits the long-term use of rainwater harvesting for the supply of safe water for drinking purposes. Most of the systems used in practice and implemented mostly by NGOs (example Goal Ethiopia, etc.) are constructing with a storage tank capacity of 3 - 5 cubic meters, sometimes bigger, and thus for short-or medium-term consumption only.

Surface water
Rivers and reservoirs
Rivers/lakes are obvious sources of water in mountainous country, but their use as a source of safe water is limited, especially from qualitative and partially also quantitative reasons. In the dry season the flow of water reduces (or even dry out). Simultaneously, when other water sources used for cattle as ponds dry up, people bring cattle to the river. This increasing quantity of both people and cattle is often directly related to the reduction of surface water quality due to higher potential for contamination (cattle excrements, diseases). In the wet season the flow for streams significantly increase due to incomes of surface runoff and underground water into the river, resulting in increased amount of fine particles and impurities with negative impact for water quality.

A possible alternative for elimination especially quantitative fluctuations is to build dams and reservoirs what is a reasonable for increase the residence time of water draining off the land. Main disadvantage of dam construction is cost and limitations for its construction, which is only possible in favorable geological and geomorphological conditions.

In terms of water quality are rivers/streams and lakes, besides ponds, practically the most vulnerable source of water supply and without water treatment are suitable mostly for non-drinkable use only as irrigation purposes and/or water for cattle.

Ponds

Ponds are as well as the other surface water sources traditional sources of water supply in Ethiopia. During the rainy season, the depressions are gradually filled with rain water and subsequently used for people and cattle consumption for few months (mostly 5-6 months) are. Water from ponds is generally not sufficient and not also acceptable in terms of quality standards. The degree of water contamination depends on the degree of security against the free access of cattle (fencing). Typical pond, unsecured, was documented in the Aleta Chuko Woreda (see picture below). As we were informed, water is also used as drinkable while it is uncertain whether the water is boiled before use at least.
From the quality point of view, ponds are the most vulnerable sources of water supply and suitable for non-drinkable use only (such as for cattle watering).

Photo 5.1: Pond in Aleta Chuko, unfenced and unsecured against cattle access

Source: Consultant's own photo

Groundwater

Wells

Groundwater is one of the reliable resource, in that it is present almost anywhere in the world and Ethiopia is no exception.

Crucial for the possibility of its exploration is given by hydrogeological conditions on site that means especially accessible depth, adequate hydraulic conductivity and storage volume and sufficient quality of groundwater.

In Ethiopia there are several typical aquifers some of which are located in alluvial aquifers (in fault-bound grabens), limestone aquifers are almost as good followed by autobrecciated volcanic rocks. Fractured-rock aquifers are unpredictable as far as yield is concerned, but in many areas they support wells that are adequate for rural supply.

Groundwater extraction of alluvial aquifers (in case of usual demands on the amount of the groundwater) is mostly unproblematic in terms of implementation and groundwater reach. In case of higher demands on consumption (e.g. for agricultural purposes, 10 or more l / s) it is necessary to implement hydrogeological and geophysical survey (surveys of existing wells, vertical resistivity soundings, seismic refraction surveys) to ensure sufficient quantity of water, which can be obtained.

For wells focused on deeper aquifers as fractured-rock aquifers is the study of geological conditions and the subsequent hydro-geological and geophysical exploration imperative for successful implementation.
Exploration strategies when dealing with fractured-rock aquifers are lineament studies, surface fracture surveys (for both orientation and spacing of the fractures), surface geophysics (locating fracture clusters with high hydraulic conductivity, using by method so-called VLF method (very low frequency electromagnetic surveying) and borehole drilling.

Deeper aquifers are most appropriate in terms of stability of both qualitative and quantitative characteristics of water and if designed eligibly for exploitation also long-term environmental sustainable.

Wells are the traditional way to extract groundwater, and accordingly there is a large variety of techniques to construct them. Where the water table is not very deep (mostly up to < 10- 20 or 25 m), large-diameter hand-dug wells are a feasible alternative. This type of well is after construction in round shapes with ferroconcrete rings (lowered in well) and a concrete slab cover). Finally the well is equipped with mechanical pump or other mechanical simple equipment (rope pump).

The advantage of the well is relatively low cost implementing and equipment, including repairs, and relatively high volume of water in the well, which allows partially compensate the fluctuations of groundwater consumption in case of limited groundwater inflow.

The main disadvantages include the possibility of easy contamination from surface and thus unstable groundwater quality.

More commonly wells are drilled using different types of drilling rigs, when drilling technology depends on geological conditions on site (mounted augers when drilling through unconsolidated sediments, mounted rotary drilling, diamond-core drilling, or percussion drilling in consolidated rocks). After drilling, well is constructed - screen and blank iron casing (PVC casing is suitable for shallow wells only), sand pack (between the borehole and the casing), sanitary clay (or bentonit or concrete) seal (to avoid infiltration of surface water into the aquifer through the borehole) and finally cleaned.

Hydrogeological wells in Ethiopia are divided into two main categories according to their total depth (shallow and deep wells) while well diameter range from 6 to 10 inches. In exceptional cases and mostly for urban centers well diameters can go up to 14 inches (depending on the size of the population and expected yield of the well.

Shallow wells reach the depth about -100 (60 – 90) m b.s., which enable using hand pumps Afridev (suitable for pumping water from approx. 45-50m b.s.) and/or Indian mark (suitable for pumping water from the depth about 60-70m b.s.). These shallow wells can be also fitted with electric pump equipment or special pump equipment which use sustainable source of energy – solar energy (solar pumps are suitable for pumping water up to 100 m b.s.).

Deep wells reach the depth mostly up to 300 meters below the surface or more and have to be equipped with electric pump and connected with electric power supply system (mostly generator, electric grid).

Galleries

In special geological conditions, e.g. tertiary flood basalts which host significant groundwater resources (good vertical hydraulic conductivity due to columnar jointing, and the autobrecciated bases and tops of the lava flows have enough porosity to hold significant volumes of water), horizontal galleries (horizontal wells) along the brecciated intervals are a viable way for tapping these aquifers.

The standard gallery is 1.5 to 2 meters in diameter, from 50 to 100 m long, and is gently inclined toward the portal. A gallery can yield up to tens of l / s, and this water can be conveyed by simple gravity flow. The gallery must be protected against entry by animals and equipped with hermetic door (excluding daylight helps avoid growth of algae).

The advantage of the gallery is low cost operation - water collected in galleries can be distributed by gravity and mostly high yield of water. The main gallery disadvantage is done by limited use (specific geological conditions only) and by high construction cost.

Springs

Springs are also one of the traditional water sources which occur at a frequency depending on the geological and hydrogeological conditions across Ethiopia and in some areas are the predominant source of water supply. Spring development is generally simple, low cost and efficient. The disadvantage is its variability in terms of the yield, which depends on the rainfall variability and its own formation. Depending on its formation (hydrogeological structure) gravity spring may decreased or even may totally dry up during prolonged dry seasons and years. The photo below depicts well protected spring with permanent yield about 0.5 l/s in Aleta Wondo.

Photo 5.2: Spring protection in Aleta Wendo

Source: Consultant's own photo

Coverage of water supply systems in proposed Woredas is shown in Maps 4.5, 4.6, 4.7 and 4.8 in Section 4.

Technical level of repar and maintenance

Current technical condition of water supply systems – wells and springs - is very different and generally decreases with the length of their use. Water resource management works only to a limited degree. The main reasons are addressed below.

The biggest problems facing technologically high supply systems, wells with electric pumps and hand pumps, non-gravity springs (there is necessary to pump water to the reservoir connected to water points) where regular maintenance is necessary and where repairs are practically impossible without a specialized team of technicians.

From various sources and information can be estimated that the realistic total number of water schemes that are temporarily or permanently out of operation moves to 50% of all water schemes.
The total number of records or unsuccessfully implemented water schemes (borehole destructed during drilling, groundwater table level not reached in estimate depth etc.) is not available.

Photo 5.3: Aleta Chuko, 5 years old water supply system

Source: Consultant's own photos

The main reasons for the mal function of water schemes are the unavailability of spare parts and inadequate maintenance of water systems, shortage of skilled and experienced technicians at the local level, lack of money necessary for their operations (the diesel generator) and/or for the purchase of spare parts and also inadequate or wrong design of the water scheme from hydrogeological / geological point of view.

Factors influencing functionality and sustainability

However, functionality and sustainability of water schemes are fundamentally influenced by the initial implementation phase when it is necessary to analyzed geological and hydrogeological conditions on site, especially with regard to the appropriate construction and at least approximate balance of groundwater sources in the hydrogeological structure.

Surface water supply - from rivers, reservoirs / lakes, ponds - is in most cases provided directly from these water sources. In case of groundwater, way to get water is different. Hand dug wells and shallow wells are mostly operated mechanically, without additional energy need, as well as in the previous case, and designed for direct use.

In case of further groundwater sources, water distribution to the final sites (water point, cattle trough etc.) is provided either without need of additional sources of energy (gravity springs, galleries) or source of energy (mainly electricity) is indispensable - deep / shallow wells, non-gravity springs. Distribution network extent depends on the yield of the source, geomorphological conditions, requirements of the population and technical possibilities. The standard distribution system includes a reservoir (50-100 m^3) into which water flows by gravity or is pumped and line or simply branched system with a total length of several kilometers and distributing the water to final water points.

Construction of new water schemes is from technical view point the most feasible way to increase the availability of water in the proposed project area.

As a new source, springs are the most convenient due to both cost and groundwater quality and partially quantity (which, however, during the year, especially for small springs can be variable).
Spot spring development involves protection of the spring and then guiding the water to the reservoir, which is connected through a distribution system to water points, cattle trough etc. Spring gravity schemes use gravity flow through pipes to provide water from a higher source to the users below.
In terms of both quality and quantity, drilled wells are the best solution for safe water supply. These resources are with respect to the above recommended for water supply of larger units or smaller towns.
The geological, hydrogeological survey and geophysical measurements as well as socio economic survey of beneficiaries is necessary condition for successful implementation of well and its functionality and sustainability.

Conclusions
Construction of new water schemes is from technical view point the most feasible way to increase the availability of water in the proposed project area, where groundwater resources are the most suitable source for safe water supply in terms of both quality and quantity.
Water schemes from the point of technical functionality and sustainability are fundamentally influenced by the initial phase when it is necessary to analyzed geological and hydrogeological conditions on site, especially with regard to the appropriate construction and at least approximate balance of groundwater sources in the hydrogeological structure.

5.3.2 Socio-economic feasibility

Decreasing risk of WASH related diseases
Contaminated water and not properly disposed human faeces cause diseases. In Sidama, only estimated 17% of rural HHs has access to sanitation. WSSs are not always properly protected from animals. In the absence of proper hygiene and sanitation behavior, water clean at the source may get polluted before it is consumed. Water quality is not regularly controlled. According to the World Health Organization (WHO),[32] diarrheal diseases have environmental fraction of 90%.

For comparison, Table 5.7 below shows the difference between Ethiopia and the Czech Republic regarding DALYs[33] that can be attributed to unclean water, hygiene and sanitation, improper water resource management and other WASH factors. The difference is striking.

Table 5.6: DALYS attributable to WASH: Ethiopia, Czech Republic

GDB (Global Burden of Disease) cause	Ethiopia	Czech Republic
Population	*76,995,000*	*10,195,000*
All causes	36,594,800	1,460,500
Total WSH-related deaths	7,074,300	4,500
% of total deaths	19.3%	0.3%
Diarrhoeal diseases	3,613,100	1,500
Intestinal nematode infections	104,000	0
Protein-energy malnutrition	553,800	500
Consequences of malnutrition	1,414,300	0
Trachoma	172,900	0

[32] Health in Sustainable Development Planning: The Role of Indicators. Yasmin von Schirnding, WHO, Geneva, 2002

[33] DALY is a unit measure for disease burden aggregating mortality and morbidity into a single measure. DALY calculation (the easiest way): Years of lost life (YLL) + years lost to disability (YLD). YLL is composed of life expectancy at age of death and the age at death. YLD is composed of duration of disease/injury, disability weight of disease/injury and % long-term cases. Zero represents "no health problem" while unity (1) represents being dead or problems equivalent to that. One DALY is thus equal to the loss of one year of healthy life. (Adjustments are sometimes used in DALYS calculations to allow tailoring to local social values and specific applications for the DALYs.)

Schistosomiasis	0	0
Lymphatis filairasis	70,400	0
Sub-total water supply, sanitation and hygiene	5,928,500	2,000
Malaria	751,800	0
Dengue	1,300	0
Onchocersiasis	1,400	0
Japanese encephalitis	0	0
Sub-total water resource management	754,500	0
Drawings	79,000	1,900
Sub-total safety of water environments	79,000	1,900
Other infectious diseases	312,300	600

Source: http://www.who.int/quantifying_ehimpacts/publications/wshdalys2004_annex.pdf
Figures have been computed by WHO to ensure comparability; thus they are not necessarily the official statistics of member states, which may use alternative rigorous methods

Data for SNNPR/Sidama were not available. It is assumed that the situation in Sidama is not better than in the rest of the country. The World Bank has, however, shared information on some WASH and water resource management related diseases in SNNPR where Malaria is the leading cause of morbidity in 15 zones and special woredas (Loka Abaya is one of them). Helmentiasis (roundwarms or nematodes transmitted mainly faeco-oraly) is the second leading cause of morbidity in 5 zones and ranked 3rd to 6th in the remaining zones.
The proposed project will improve access to clean water supply and support interventions aiming at changes in sanitation and hygiene behavior, as well as at proper sanitatin around the newly constructed WSSs. It will thus contribute to decreased incidence of related diseases and of DALYs lost due to these diseases.

This will have direct socio-economic impacts such as:

- Decreased expenses for medication and medical treatment
- Decreased expenses for purchasing or tankering drinking water
- Decrease in expenses for water treatment at HH level (such as filters)
- Decrease in incomes loss due to illness
- Decrease in school absences due to illness, treating water for drinking

As well as indirect impacts on people's livelihoods, poverty reduction, development issues

The proposed project will contribute, directly and indirectly, to improved socio-economic situation of the intended beneficiaries.

Cost per beneficiary
It has been estimated that the project will provide access to clean drinking water and improved hygiene and sanitation practices of some 26,000 to 30,000 people. Depending on the selected options (section 5.8), the cost per beneficiary will vary between 100 € (Option 1 – includes preparatory activities) and 106 € (Options 2-3 (cost of preparatory activities will be borne by CDA and are not included in the budget).

The technical life time (without major rehabilitation) of proposed engineering solutions is estimated on the basis of GOE standards (Section 3.2) at 10 years which means that the donor would provide drinking water for a per capita investment of about 10 €/year. It is proposed that the communities make a contribution of some 20% of the construction cost and the Woredas 10%, which would decrease the share of investment cost/cost per beneficiary to be covered by the CDA.

The cost per person is likely to be mitigated by savings due to decrease in DALYs, payments for medicine and water and time saved to fetch it that could be used for other activities including productive activities. It is also possible that once water is available, people will open small coffee shops or prepare food to sell and generate small incomes.

Monitoring impacts
The proposed socio-economic needs assessment and basic KAP provide basis for monitoring; evaluation of likely impacts after some 2-3 years of implementation/water availability would help to establish whether the project is financially feasible.

5.4 Potential for cooperation with partners in WASH in Sidama

Annex X provides an overview of Donors and NGOs in WASH sector in Sidama.

Technical solutions used by the NGOs working in Sidama in general and in Loka Abaya and Aleta Chuko in particular are described in section 5.5 below. The NGOs implement needs assessment survey, facilitate establishment of WASHCOs. Emphasis is on integration of community development, sanitation and hygiene education as well as on close cooperation with the local, zonal and regional authorities.

The team visited only one NGO scheme – solar power driven spring distribution system implemented by Plan Ethiopia in Shebedino Woreda. At the time of the visit the scheme was under construction. Factors influencing sustainability have been discussed with the NGOs in detail. Investigation on sustainability of WSSs constructed by NGOs and handed over to the Regional Water Bureau would require site visits that were not possible due to time constraints. As mentioned in other parts of this report, inventory of WSSs including information on their status was not available during the mission. Information obtained from the Zonal Office and from the Woredas indicate low sustainability.

Sustainability has been briefly assessed for the windmills project implemented by LVIA in the Meki-Ziway area. Estimated 50% of the schemes remains sustainable after formal hand-over to the Oromyia Regional Water Bureau. The main problem is reportedly availability of spare parts. The water users committees reported to have funds. LVIA informed the mission that they are now assisting with inventory and procurement.

Potential for relation and coordination with several governmental and non-governmental organizations as well as with the private sector have been identified.

Table 5.7: Summary of areas for possible cooperation

Organization	Stakeholders roles and competences	Possible areas of cooperation
Governmental and semi-governmental organizations		
MOW&E	The Ministry is key partner at the National level, mandated to sign international agreements. Likely signatory to MOU on the proposed project The Ministry hosts the National WASH Coordination Office, initiates JTRs. Director Water Supply and Sanitation Directorate is the Secretary of the National WASH Steering Committee.	Agreeing on and signing the MOU. Consensus on the project design and implementation modalities. Consultation on MIS, technical surveys
Ministry of Mines, Geological Survey of Ethiopia: Ground Water Resource Department	The Department has been cooperation with the CDA (Aquatest) on preparation of hydro-geological maps and reports. The Department can also conduct detailed hydro-geological surveys that may be necessary in the project area.	Hydro-geological map of Sidama expected end 2012 Potential partner for technical surveys
Department of Drilling Services	The Department has currently the capacity to drill up to 500 m and up to 100 m respectively.	Potential implementation partner for implementation of deep wells
NCA	Works also as a contractor for rural water supplies, reported drilling capacities for shallow wells up to 90 m	Possible implementation partner for shallow wells
Regional WASH Office	The SNNPR WASH Coordination Unit attached to the Bureau is responsible for coordination of WASH activities in the region and will possible be responsible for the regional WASH MIS. Harmonization of M&E, consultation on planned and ongoing NGO and donor ongoing and planned activities.	Updated MIS, consistent M&E system Convergence and coordination with related projects and local WASH structures
RBWM&E	The Bureau is the key strategic partner for the project at the regional policy and strategy level.	Consensus on the project design and all major decisions. Formalizing MOU.
	The Bureau is responsible for administration of WSSs and has technical capacities in hydrogeology and engineering.	Exchange of know-how, cooperation on hardware technical sustainability
	Implements water quality control	Water quality monitoring
	Facilitating information of power supplies and the possibility of extension to the WSSs; supporting negotiations of agreements about possible extensions. (The Mines and Energy Agency is subordinated to the Bureau)	Assessing the option of extending electricity supply to WSSs
BOFED	Responsible for budgetary allocations (including for implementation of WASH activities), member of Regional WASH Coordination Mechanism.	Clarification and guidance on issues related to implementation modalities, budgetary allocations, procurement, coordination
DOH	Members of regional WASH Coordination mechanism. Extends to villages through HEWs, clinics and health posts. Important partner for health and	Close cooperation on health and hygiene promotion, capacity building of HEWs and

Organization	Stakeholders roles and competences	Possible areas of cooperation
	hygiene extension activities	volunteer health extension workers
DOE	Members of regional WASH Coordination mechanism. Extends to villages through schools. Important partner for health and hygiene extension activities	Close cooperation on health and hygiene promotion particularly at the community level
SZDWM&E	Line Department for the proposed project and important partner at the operational level. Link between Woredas and regional authorities. Comprehensive understanding of water situation in Sidama Zone	Consultation on strategic issues. Close cooperation at the operational level.
WWT Loka Abaya	The WWT is responsible for coordination of WASH related issues. Woreda Water Office has competence to construct and repair low-cost technologies. Woreda administration is responsible for administrative issues	Consultation, possible short-term secondments and involvement of local level staff for consultation and capacity building in both soft- and hardware. Close liaison during planning and implementation.
Aleta Chuko Woreda Administration and Technical Offices	WWT is not formally organized. Woreda Water Office has competence to construct and repair low-cost technologies. Other Offices relevant for community development and health and sanitation promotion Woreda administration is responsible for administrative issues	Possible support with forming WWT. Consultation, possible short-term secondments and involvement of local level staff for consultation and capacity building in both soft- and hardware. Close liaison during planning and implementation.
Kebeles	Partner at the local planning and implementation level in selected Kebeles.	Ongoing dialogue and close cooperation during planning and implementation
Donors, donor supported projects		
GIZ, AMES-E	GIZ has been developing competence of local technical service providers and training institutions and supporting the use solar and other alternative energies in the whole of Ethiopia including the SNNPR.	**Cooperation on the pilot using solar energy for water lifting in Loka Abaya**
UNICEF	One of the main actors in WASH sector in Ethiopia Has developed a series of relevant materials, approaches, training and IEC materials. Inventory of drilling capacities, WSSs unit cost. Considerable time constraints, currently no representation in the project area	Consultations on WASH related issues, exchange of materials and information
UNOCHA	UNOCHA maintains a comprehensive data base with different layers of information reaching down to community level.	The PI can provide information on current issues and obtain information and maps important for coordination is the WASH sector
The World Bank	The WB is not represented in the project area but maintains close dialogue with local WASH actors, currently in particular on health and hygiene promotion. Organizes workshops, is accessible for consultations. Important source of IEC and KAP materials	Cooperation on sanitation and hygiene promotion and community development issues.
RiPPLE	Ripple will soon be completed. Completed papers and studies are important sources of information.	Source of information, potential partner for action research supply chain study for supply of spare parts
NGOs/CSOs		
SNV Does not work/plan to work in the proposed priority Woredas but can provide support in the mentioned areas	Capacity building and training for preventive O&M (methodology and materials developed, including for shallow and deep wells)	Improved technical sustainability
	Capacity building of WASHCOs in organization and management, including financial management and MIS	Improved organizational sustainability
	Needs assessment (for demand driven, cost recovery-based planning of project interventions)	Improved economic sustainability
	Support to WASH capacity building in the Woredas (could be a 2-tier structure including decision makers (WWT) and operational, implementation level)	Local government commitment – improved cooperation with partners Woreda operational plan
	CLTS for community mobilization (available: training manual, implementation manual, M&E manual)	Improved environmental sustainability
	Build capacity of NGOs-cooperating partners in all soft ware capacity building areas mentioned above	Increased capacity for implementation of outsourced software activities
SC USA	Mechanism for local provision of spare parts; possible replication/adaption of approach piloted in four areas: Spare part shops are attached to the WASH Board at the Zonal level linked with licensed importers from Addis Ababa. SC USA plans to replicate the model in four Woredas in Sidama in about 1 year with supply shops at the Woreda towns/administrative centers.	Improved local availability of spare parts in the proposed priority Woredas
	Support with establishing and building capacity of WASHCOs, for transparent, accountable and sustainable O&M of the WSSs including setting up cost-recovery tariff and mechanism for tariff collection.	Increased likelihood of sustainability
CCRDA WSF	Maintains directory of NGOs and a separate directory on NGOs operating in WASH sector. Coordinates WSF. WSF Southern Region Platform in Hawassa.	Information on NGO activities, coordination at the local level
Plan Ethiopia	Considerable experience with WSSs and all aspects of community development. **Works in Sidama in Shebedino and Gorcha**. Plans to expand to other Woredas. Technologies include springs with motorized gravity systems, deep wells with engine driven pumps. Pilots solar energy	Sharing information and experience, particularly on solar energy installations, (possible partnership on piloting) as well as on implementation and O&M of high

Organization	Stakeholders roles and competences	Possible areas of cooperation
	driven pumps in Shebedino. **Member of solar energy network in SNNPR.**	technology WSSs and community development. Possible cooperation on piloting
WaterAid	One of the leading NGOs in the WASH sector. Compiles inventory of water points. Developed a wealth of technical and IEC materials and tools for WASH infrastructure and promotion activities (including dramas and songs). Does not implement; provides support to NGOs (Water Action and others) in the form of funding, implementation support, capacity building and materials.	Source of information and materials on technical and non-technical issues. Consultation on implementation issues particularly for community development and sanitation and hygiene promotion.
PIN	PIN has been working in Ethiopia since 2003, developed good relationships with and is well known to local partners and accumulated considerable experience in the WASH sector. **Works in SNNPR including Loka Abaya** (roof catchments). Good understanding of issues related to community development, sustainability issues as well as to hygiene and sanitation promotion. Conducts trainings, develops and distributes training materials, capacity building of local partners.	Potential sub-contractor for the community development, could provide link between "hard" and "soft" components. Potential sub-contractor for the hygiene and sanitation promotion component
LVIA	LVIA has over 15 years experience with rural water supplies in Ethiopia. Promotes alternative energy sources including bio gas, constructed over 70 windmills in the Meki Ziway area. **Works also in SNNPR and in Sidama (Bensa Woreda)** with developing micro-hydro power for home use. Experienced in and committed to participatory approaches and community development including sustainability issues and M&E. **Member of solar energy network in SNNPR.**	• Potential implementation partner in different ways: • Sharing experience on various models of WSSs and health and sanitation interventions. • Sharing study documents/promotional materials and organize technical training for local staff/WASHCOs; could be a partner in implementation of the proposed project. • Could deploy experienced technical experts.
GOAL	GOAL has been working **in Sidama since 2004 of which 6 years in WASH in Hawassa Zuria.** Focus on low cost technologies. Emergency water supplies in **Shebedino** (ground water, spring development, roof catchments). Experienced with community development and participatory approaches.	Potential partner/sub-contractor for scaling up health and sanitation promotion
Private sector		
Hydro-geological companies	There are several hydro-geological companies who could be assessed on the competence and capacities in implementing some or all of the technical surveys	Sub-contractors for technical surveys
Construction companies	There are several companies specialized in rural water supplies who could be assessed on their capacity and competence in implementing the works	Sub-contractors for works
Traders	There are several licensed traders in Addis Ababa who could become part of the spare parts supply chain	Organizing spare parts supply chain
Educational and training institutions		
	Universities, colleges and in particular TVETS already are partners for NGOs and donors in capacity building and skills training. Linking in to existing/supporting new programs for O&M in TVETs and courses for TVETs post-graduates (SNV provided capacity building to TVET in Hawassa, there may be other "pilots" or experiences of cooperation).	Possibility to link in to existing programs for O&M offered by TVET in Hawassa Assessing the training capacity and possibly support new programs

5.5 Recommended engineering solutions (hard components)

The available water resources in the assessment area is predominantly ground water followed with low yield (usually less than 2 l/sec) spring sources. Information on existing WSSs provided by the two Woredas (Annex O) reveals that dug well and shallow wells are the major sources followed by deep wells and springs. The estimated depth of deep wells ranges from 300-350 m for Loka Abaya and from 150 - 200m for that of Aleta Chuko.

The recommended engineering options for the proposed priority Woredas are deep wells and springs with gravity pumping. Rainwater harvesting from roof surface (which is being practiced in some school and health post compounds) as well as hand-dug wells which are available in some places can be considered as supplementary sources in case of absence and/or none feasibility of groundwater and springs.

Hydrogeological conditions[34]: in the Loka Abaya and Aleta Chuko Woredas aquifers are largely resulting from a processes related to lava flow and tectonic fractures as well as weathered and fractured volcanic rocks with minor sediments deposited between different series of lava flows.

The area is made up of rhyolites, trachytes, basalt, and pyroclastic deposits such as ignimbrite, tuff, scoria and ash deposited during different ages. As they are deposited at different time and space they have been subjected to different degree of weathering and fracturing. Between eruptions, these rocks have been weathered and/or eroded with subsequent deposition of alluvial materials giving rise to layers of inter-volcanic alluvial deposits and soils. The aquifers are derived from weathered and fractured rocks, sediments deposited between different lava flows, and porosity developed during lava flows especially in basaltic lavas. The sediments deposited between lava flows have very limited extent and are not continuous.

In general, the type of the aquifer varies from confined to semi-confined aquifers, although there some instances where shallow aquifers are unconfined. Because of the complexity of the aquifers resulting from lava flow, pyroclastic fall deposits, lacustrine and fluvial deposits and fracturing due to long persisting tectonic activity affecting all the formations a single aquifer system practically doesn't exist.

In terms of water quality, the water samples collected from many boreholes show that the water quality in general varies between sodium-calcium - Bicarbonate and calcium – sodium bicarbonate types with some calcium-sodium-magnesium bicarbonate waters and Sodium-bicarbonate waters [1].

5.5.1 Loka Abaya

In terms of agro climatic classification, according to the Woreda administration, 83% of the Woreda falls under lowland and the remaining 17% falls under midland/altitude '*woyena dega'* (between 1101-1700 m a.s.l.). The weather condition is generally dry air in the lowland and humid in middle altitude. There are two wet (rainy seasons) locally called *'belg'* (with the small rains which runs from March to April) and 'meher' (the main rainy season which is from June to August).

With regards to water resources potential, the reliable source is ground water with depth increasing from midland towards the lowland areas. Information obtained from the Woreda Water, Mines and Energy Office and Sidama Zone Water, Mines and Energy Resources Department indicates that depths can go up to 350 m. The water quality is reported to be potable and meeting the WHO standards.

As per the information gathered from the Woreda WASH team, there are 53 improved water supply schemes, with majority of existing WSSs in woyena dega, where water sources such as shallow wells/dug wells are relatively better available (see Annex O). Out of this shallow wells fitted with India Mark II hand pump account for 60%, rainwater harvesting (roof surface) 13%, hand-dug wells fitted with Afridev pump account for 15%, borehole with motorized pump for 10% and on spot spring development for 2%[35]. The reason why low-tech options have taken the higher proportion is because of the fact that most of the construction works is managed by the Woredas (with limited numbers of qualified and experienced professionals and not equipped with high-tech equipment such as drilling rigs or special tripoids, which makes construction of large and more complex schemes difficult. NGOs face typically similar limitations. The most desirable solutions are those which can provide adequate quantity (minimum 15 liters per capita per day) on a reliable basis (water is available all-round the year) to large number of communities. Ground water development with pumping and distribution system or large scale gravity scheme from spring sources could be such solutions.

The recommended engineering solutions and technology options for this Woreda are mentioned below. It should be noted that quantities are subject to scenario adoption, depending the budget available (see chapter 5.8):

- Deep wells with motorized pumps (preliminary estimate: 6 to 4)
- Pilot scheme powered by solar energy in the Woreda Administrative Centre (1 to1)
- Shallow wells fitted with India Mark II hand pumps (estimated 2 to1)
- Rainwater harvesting in schools and health facilities, and Kebele centers (where there is reasonable size roof and proper type)

[34] Source: Importance of Hydro-geological Mapping for Groundwater Development: Case Study on UNDP assisted Hydro-geological Mapping Project of Yerga Alem and Kilisa Sheets in SNNPR (Getachew Geletu from SNNPR, Shiferaw Lulu & Abebe G/ Hiwot from AG-Consult).

[35] The data were obtained from the estimate of the Woreda WASH Team which will be verified in the near future (by the end of this year) by the on-going National WaSH Inventory (NWI).

5.5.2 Aleta Chuko

The majority of the land mass (75%) is categorized by the Woredas as lowland with and the remaining 25% of the Woreda as midland. The climate of the Woreda is mostly dry in the lowlands, and humid in the woyena dega areas. The main rainy season (*meher*) starts usually in June and lasts until August, with some irregularities in the kola areas and small rains which runs from March to April (*'belg'*).

Data collected from Aleta Chuko Woreda Water, Mines and Energy Office[36] shows that there are a total of 175 improved water supply schemes constructed by government, NGOs and the Sidama Development Association (see Annex O), with majority of existing WSSs in higher elevations, where water sources such as shallow wells/dug wells and springs are relatively better available. Out of the total number, shallow well fitted with India Mark II hand pump account for 61%, followed by spot spring development (26%), deep borehole with motorized pump (10%) and hand dug well (3%).

Based on the water resources situation and existing local experiences, the following engineering solutions are recommended:

- Deep wells with motorized pumps preliminary estimate: 5 to3
- Shallow wells fitted with India Mark II, Preliminary estimate: 2 to1
- Spring development with distribution system. Preliminary estimate: 2 to1
- Rainwater harvesting in schools and health facilities, and Kebele centers (where there is reasonable size roof and proper type) may complement the above.

5.5.3 Implementation steps for engineering solutions

The suggested study and design interventions are:

1. Geological, hydrogeological and geophysical study and mapping of proposed sites (well fields) to know and determine the hydrogeological structure, tectonic zones, estimate of depth, quantity and quality of water, to identify suitable location for well position and areas which requires protections. This study may take 2 to 3 months and can be handled by the local and/or international experts.
2. Design and project documentation - which involves hydrogeological and engineering well design and/or spring development design, engineering survey (pipe route) and water supply system design. The result of the study – for the case of ground water sources development will be determining the well and power station (casing, pump position, pump and power design) and main as well as distribution systems (pipe dimensions, water reservoirs and distributions points and so on). Whereas, for spring based schemes, the result will be source development design works and specification (spring box, collection /balancing chamber, power station (in case of non-gravity flow schemes) and distribution system. Options for power supply will during detailed study and design stage of the project on case-by-case basis to determine the most sustainable solutions. Schools and health institutions will be covered by water supply from the newly constructed schemes as much as technically possible.

   This activity can be handled by the (proposed) Project Implementer (PI). The estimated time will be within 2 to 3 months.

5.5.4 Construction works

Subject to findings from the geological, hydrogeological and geophysical study, construction of the water supply works will involve:

- Construction and development works – which involves well drilling, casing, well development, well yield test (to determine the static and dynamic water level as well as the possible pump positions), and quality testing.
- Spring development works- which involves development of the source, collection /balancing chamber, power station as well as quality and quantity testing.
- Data evaluation, prospective water treatment design.
- Power station – which includes pumping equipment and connection to energy source.
- Water mains and distribution system construction and construction of associated structures and accessories such as storage reservoirs, pipe lines, public water points, generator and guard houses, cattle trough (for small animals where other source is critical) or water source protection.

[36] The data were obtained from the estimate of the Woreda WME office which will be verified in the near future (by the end of this year) by the on-going National WaSH Inventory (NWI).

5.5.5 Conclusions

Recommended engineering solutions in selected priority Woredas Loka Abaya and Aleta Chuko are focused, in accordance with supposed hydrogeological conditions, water resources situation and existing local experiences, especially to groundwater sources, which seem to be the best solution from both quantitative and qualitative point of view.

In Woreda Loka Abaya, recommended solutions are deep wells with motorized pumps, pilot scheme powered by solar energy in the Woreda Administrative Centre, shallow wells fitted with India Mark II hand pumps and rainwater harvesting in schools and health facilities, and Kebele centers (where there is reasonable size roof and proper type) may complement the above.

In Woreda Aleta Chuko, recommended solutions are similar - deep wells with motorized pumps, shallow wells fitted with India Mark II, spring development with distribution system and rainwater harvesting in schools and health facilities, and Kebele centers (where there is reasonable size roof and proper type) may complement the above.

The proposed project area (lowlands of Loka Abaya and Aleta Chuko) presents good opportunity for the comparative advantage of specialized and experienced Czech companies in the areas of geology and hydrogeology. The assessment mission concluded that although hydrogeological surveys and drilling works are implemented in the SNNPR by private contractors, NGOs and government organizations, there is a need for further transfer of know-how and on-the-job support and supervision of such surveys and drilling works if an adequate quality is to be assured. Czech Republic with its extensive traditional experience in hydro-geology has a comparative advantage. Technical works (drilling) can, under close and competent supervision, be well managed by Ethiopian companies. What sets a Czech, specialized and experienced company apart is the deep knowledge and understanding of geology/hydrogeology related interdependencies and causalities, ruling principles of water circulation, solutions for relatively large and complex territorial areas ("regional hydrogeology") – all that can be summarized under the "concept of holistic approach to solutions", as opposed to a one-off "commissioning a drilling job" as has been as the practice by several NGOs.[37] Comparing the cost of proper surveys with the increasing cost of drilling, "commissioning a drilling job" is not a viable solution. Hydrogeology in Ethiopia is relatively young. The level of competence achieved through education, long-term tradition and experience and transfers of know-how cannot be reached in a relatively short-term.

Experience shared with the assessment mission by a rural water supply project funded by bilateral donor and implemented in SNNPR, indicates that essential problems arise from the total lack of information about hydrogeology of the site where the drilling works (borehole, well) were done.

Relevant documentation including technical reports, reports on drilling (technology used, diameter/depth of the borehole, possible tectonic malfunctions, geological log, diameter of the equipment and its perforation, results from hydro-dynamic tests or chemical results of samples is not compiled. Documentation on the functioning of the WSS (real amounts of pumped water, checks and analyzes) doesn't exist. This significantly complicates the reconstruction or rehabilitation of not- or not properly functioning schemes. Scanning tests only provide a view of the equipment (casing - perforated or complete) and diameters. In the absence of real geological and hydrogeological data, it is virtually impossible to establish important data such as inflow or tectonics.

For that reason, it is necessary to investigate each separate case individually and in accordance with the problems occurred to the borehole - equipment collapses, at what depth, insufficient inflows - decrease of abundant, borehole pollution (with sand), and according to this parts of information to try to decide on reconstruction of the borehole. There is no guarantee that it will be successful or cost-efficient.

Moreover, the primary reasons may not be technical but social or economic (negligence in operation, deliberate damage, lack of funds for maintenance.

Based on the above, the assessment team concluded that rehabilitation of existing water sources in the proposed project area should be considered only if:

- *Socio-economic assessment reveals that the reasons for mal functioning are technical and are not caused by insufficient incomes from tariffs. If the failure is due to the lack of financial resources for O&M, the reasons behind it need to be further investigated and measures introduced to ensure revenue sufficient to sustain the source. Only after such mechanism is in place and works, rehabilitation should be considered.*

[37] An example are two drills commissioned by PIN in Alaba Special Woreda where one is a failure

- *Rehabilitation is possible when the existing system is still usable, groundwater quality is satisfactory and water source does not necessarily require replacement.*

- *The difference in cost between constructing new or rehabilitating existing system can be only determined after a detailed technical assessment; economic feasibility of rehabilitation depends on the status of the casing, of the borehole and other components.*

5.6 Recommended non-engineering solutions (soft components)

5.6.1 Rationale behind including non-engineering solutions

Often, non-engineering (also called "soft") aspects of rural water supplies including community development or hygiene and sanitation promotion are neglected. These results in decreased sustainability due to ineffective management of O&M and decreased effectiveness (decreased in WASH caused DALYs).

"Water is life"; clean drinking water leads to decrease in water borne diseases; increased availability of clean water also has a positive impact on social and economic development of the communities. However, these impacts can materialize only if:

- The supply is regular over time (reliability of supply) and people do not have to revert to traditional, often polluted sources.
- Water from the source is and remains clean (due to proper maintenance of the "sanitation zone". Open defecation for example contaminates the environment and water sources; one person drinks contaminated water, gets sick and infects others. Children suffer from chronic problems with parasites. Another example is access of livestock to the sanitary zone that can also lead to water contamination.
- Safe water chain: The water remains clean by the time it reaches the consumer's stomach (and is not polluted during handling, storage and use).

Also if above prerequisites are met, positive impact on WASH caused DALYs by improved access to clean water can be mitigated by lack of personal hygiene (hand washing with water and detergent, bathing, washing clothes).

Sustainability of investments and effectiveness of interventions cannot be ensured by constructing water supply schemes alone; it is recommended to integrate community development and sanitation and hygiene promotion – following the integrated WASH approach of the Ethiopian Government and considered internationally as "good practice".[38]

Of the three pillars mentioned in the 2004 National Sanitation Strategy for Ethiopia, pillar 2 fits well within the mandate of the proposed project.

5.6.2 Community development for improved sustainability

Perceived priority need is the key factor. It is therefore recommended to conduct, during the preparatory phase, socio-economic survey that will include i.a. assessment of need as perceived by the communities. In rural water supply and sanitation projects in Ethiopia, Kyrgyzstan, Yemen, Pakistan and many other countries donors operated on a Demand Responsive Approach principle. This entailed communities expressing, in writing, their interest to be included in the projects and to contribute to the construction costs and to cover the full cost of O&M, interventions in areas where perceived need is weak should be reconsidered.

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[38] The National Sanitation Strategy for Ethiopia (2004) mentions three pillars for improved sanitation and hygiene:

- Pillar 1: Enabling framework to support and facilitate an accelerated scaling up through policy consensus, legislation, political commitment, inter-sectoral co-operation, partnership, capacity building linked to performance contractual agreements, supportive supervision, research and monitoring
- Pillar 2: Sanitation and hygiene promotion through participatory learning, advocacy, communication, social marketing, incentives or sanctions creating demand and forging behavior change
- Pillar 3: Improved access strengthening supply of sanitation in terms of appropriate technology solutions, product/ project development, support to local producers and artisans

The needs assessment will be followed by community development activities that will continue throughout the project duration. Guiding principles: inclusive participation, transparency, accountability, good governance, empowerment. The communities and their elected representatives will make informed choices of technologies, on tariff and other aspects of O&M. Contracts for technical solutions will be signed only after the potential beneficiaries submit written requests, including organization for O&M and receipts for agreed cash contributions deposited in a designated bank account.

Self-monitoring and planning mechanism based on an ongoing dialogue among partners is recommended as a (tested) tool for increased awareness, empowerment and ultimately for improved sustainability.

5.6.3 Sanitation and hygiene promotion for improved effectiveness

It is recommended to implement, during the preparatory phase, simplified assessment of knowledge, attitudes and practices (KAP) to serve as a basis for designing IEC (Information, Education, Communication) interventions ad for setting realistic and measurable targets in the areas of the three WASH thematic groups: (i) Safe excreta disposal, (ii) hand washing/personal hygiene and (iii) safe management and treatment of water (water source monitoring, fencing, proper drain off, sanitation zone). IEC interventions will include local stakeholders in different roles and capacities and will involve schools and children – the agents of change for future generations[39]. The proposed project can play role in creating awareness among local government institutions, and communities, and will link with other partners who are knowledgeable about the subject and work in the wider project area.

Moreover the project will aim at enhancing coordination and cooperation in community development and sanitation and hygiene promotion and build capacity of local partners including Woredas, HEWs (Health Extension Workers), DAs (Development Agents) , community leaders and experts, the private sector and CBOs/NGOs working in the localities, for gradual handing over of responsibilities and implementation of interventions. A phasing out plan is proposed to be part of the component.

5.6.4 Recommendations and key assumptions

1. *It is recommended to include community development for improved likelihood of sustainability*. Intended beneficiaries should be empowered to participate as equal partners in all stages of the project including planning and monitoring. This can be achieved by building early partnership and dialogue with an effective feedback mechanism combined with training, capacity building and mentoring throughout the project. Key elements: Needs assessment; organizing water users representations, creating basis for good governance; tariff setting, approval and effective collection mechanism; capacity building for technical and non-technical aspects of O&M; support to cooperation with strategic partners; self-monitoring and planning. *Assumptions:* (i) The project can reach an agreement(s) with competent sub-contractor(s). (ii) Water is perceived by the community as top priority issue.

2. *It is recommended to reconsider interventions in areas where perceived need is weak*. *Assumption:* There is a common understanding (possibly included in the MOU) on the need of demonstrated perceived need as a pre-requisite for intervention and the option of "opting out" is accepted by the Client.

3. *It is recommended to include health and hygiene promotion (including CLTS)* through participatory learning, advocacy, communication, social marketing, incentives or sanctions creating demand and forging behavior change. Key elements: Simple KAP survey; building up knowledge; raising awareness on possible negative effects of current attitudes; supporting the introduction of improved practices in sanitation and hygiene (including CLTS/CLTSH[40] to decrease/eliminate open defecation). Implementing partners:

[39] Hygiene means personal, school and household cleanliness. Hygiene behaviors in schools include: keeping drinking water safe, cleaning and repairing water sources, toilets and hand washing facilities. It means always having clean practices such as using latrines and urinals, washing hands before eating and after going to the toilet, washing face, bathing and wearing clean clothes. Activities in the home and community can include: helping younger brothers and sisters to wash or learn to use a toilet, helping keep the home clean, making a survey of dirty/unhealthy places in the neighborhood or market, telling parents about what is learned in school on sanitation.

[40] CLTSH, which is Community Led Total Sanitation and Hygiene, is a participatory approach, which one can trigger the emotions of communities to think by themselves and their environment critically and stand for a real change. This approach and is being used in Ethiopia since 2007. It is a tool by which total sanitation can be achieved by creating an open defecation free community instead of counting latrines here and there.

Trained/upgraded HEWs, Development Agents, pro-active community members, care takers of the WSSs teachers, school children (= agents for change).

4. *It is recommended to prepare and to implement a phasing-out plan* for the period of 5 years that foresees gradual handing over of responsibilities to trained local partners. *Assumption*s: (i) 3-5 years will be sufficient to develop adequate local capacities. (ii) Trained persons will remain at the location.

5. *Recommended implementing modalities*: Subcontract with NGO working in Sidama/SNNPR and acceptable to the local authorities. Option would be implementation through the existing government system. The issue of implementation modalities, including for the non-technical solutions, is discussed in section "Implementation modalities" below.

5.7 Form of water resource management

One of the results of the long standing debate and continuing search on the best ways to ensure the sustainability of rural water supply services has been the focus and impetus it has created towards adopting the concept of community management so much so that it has now become enshrined in the Federal Water Resources Policy on Drinking Water Supply. While the adoption of community management concepts for rural water supply as policy is by itself a major step, the appropriate implementation of this concept needs to be emphasized if the objective of scheme sustainability is to be addressed.[41]

5.7.1 What does water resource management[42] involve

- Transparent management of funds (collecting fees, issuing receipts, correct book keeping, timely payment of dues)
- Protection to prevent contamination (fencing, locking gate to prevent entry by animals, cleaning drainage, protecting sanitation zone)
- Technical maintenance (greasing, replacement of running parts and chlorination as per schedule or if needed, reporting break downs, replacing/repairing broken down components)
- Provision of service to ensure optimal water resource utilization and as agreed with the water users (maintaining agreed opening times, monitoring amounts of water collected, water quality monitoring)
- Guarding against misuse (guidance on/support with operation, repercussions against intentional damaging and mishandling)
- Conflict resolution on issues related to water use/abuse, non-payment, etc.

5.7.2 Who is responsible?

The legal owner should be fully responsible for all aspects after handing over and final acceptance. Some functions can be performed by the owner; some can be outsourced against payments. This should be laid down in the by-laws and supported by possible agreements between the owner and providers of works, goods or services.

If WASHCOs were the legal owners, the Committee would be able to contract care takers, guards or cashiers. It could hire technicians or make agreements with suppliers of spare parts. These contractors could be from the community, the private sector or from the government.

5.7.3 Training and capacity building

During the planning and implementation of the project, attention needs to be paid to developing capacities adequate to implement the above tasks as well as other tasks that may be required by the specific water source and agreements with water users.

This includes training, preparing/distributing manuals and guidelines, support in procurement (of works, goods and services). Training and capacity building on technical issues should be part of the hardware component. Training and capacity building on non-technical issues should be parts of the community development and

41 Kifle Lemma&Associates Law Office. April 2006. Assessment of the Challenges and Alternatives for Water and Sanitation Committees – User Groups with Special Emphasis on Legal Aspects. Plan, Intermon Oxfam, Water Aid, Addis Ababa

42 In this report water resource management is understood to be the management of the water supply schemes

hygiene & sanitation promotion components respectively. Fluctuation of trained people is an issue; it is recommended to train at least two persons for one and the same task.

5.7.4 Audits and inspections

A mechanism should be in place for periodic external and independent financial audit, controls and monitoring, probably by the relevant Woreda, Zonal or Regional authorities. The project should support the preparation of guidelines, manuals and check lists for such external audits and inspections.

5.7.5 Current situation in the four visited Woredas

While it is understood that WASHCOs are the owners and managers of the WSSs, responsible for routine operation and maintenance and tariff collection, there is no legal basis for such ownership. Neither is there a clear division of responsibilities between the Kebele administration, the Woredas and the WASHCOs, once the schemes have been handed over by the implementers. WASHCOs are in general weak and not well organized, with unclear legitimacy. They receive minimal to no training and have no tools (tripoids, fishing tools, tool kits).

Calculation of tariffs is not transparent; template for tariff calculation was not available. Water tariffs are collected at the distribution points and vary between 0.25-0.50 ETB/jerry can (about 20 l). The team enquired about collection rates which were reported between 90-100%. Where fees are paid at the time of water collection, this does not seem unrealistic. Where there are optional water sources (rivers, streams) nearby, people collect water there rather than paying.

The funds collected by WASHCOs should be used to pay Woreda technicians and spare parts but are reportedly not sufficient. The assessment team could not, during the short time spent at each visited water supply system, obtain records and establish use of collected funds. Subsequently, operation and maintenance is poor and sustainability weak. Many schemes fall gradually into disrepair before their technical life is over.

Organization of operation and maintenance of WSSs can work better in areas where there are no optional water sources in reasonable distance and people perceive water as first priority. The proposed project areas – lowlands of Aleta Chuko and Loka Abaya- are such areas. Additional factors increasing the likelihood of sustainability are described in detail in section 5.11 below.

5.8 Estimated cost of proposed solutions

Three proposed budget scenarios have been elaborated, reflecting comments from the CDA received on 17 August and comments from the Reference Group received on 14 September:

- **Scenario 1**: Five year project including solar energy pilot and preparatory phase to be completed by the same Project Implementer in a period of five years
- **Scenario 2**: 2.5 year project that can be completed by one implementer, including solar energy pilot and excluding preparatory activities that will be implemented separately by the CDA
- **Scenario 3:** 2.5 year project that can be completed by one implementer, excluding solar energy and excluding preparatory activities that will be implemented by the CDA
- **Scenario 4:** 3 year project that can be completed by one implementer, excluding solar energy and excluding preparatory activities that will be implemented by CDA.
- **Scenario 5:** 3 year project that can be implemented by one implementer, including solar energy and excluding preparatory activities that will be implemented by the CDA.
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All five scenarios are within the budgetary allocation of about € 3 million in total until 2017.

If scenarios 2, 3, 4 or 5 are selected and the projects tendered separately, it is recommended to develop specific criteria to standardize the interventions by different parties so as to avoid a plethora of different approaches, priorities or implementation methods. Some of the criteria could be a standardized community mobilization and community development approach, clear milestones for the process, minimum co-financing in cash, identical participatory monitoring and planning mechanism. It is also important that the “institutional memory” from the preparatory phase is fully transferred to the Project Implementer and the continuation of following connected activities is seamless.

This poses a particular challenge for options 4 and 5 that have been included upon request from CDA and the Reference Group, where 5 projects are to be tendered separately, with the possibility of 5 different implementers and subcontractors for hard-and soft activities.

It should be noted that community development and capacity building activities limited to 2.5 or 3 years are likely to negatively impact on sustainability; monitoring data will only be available for 1.5-2.5 years and the time for remedial actions reduced to 1-2 years. From the consultant's experience, 5-7 years of systematic support to O&M is required.

It should also be noted that splitting the project in to two or five will lead to increase in overall cost and result in decrease of WSSs (estimated 1 less). This can mean decreasing the number of beneficiaries by up to 5,000.[43]

Cash community contributions of 20% to the construction cost (or a maximum ceiling if the construction cost is very high) and Woreda contributions of 10% are strongly recommended and should be collected upfront to verify perceived priority need and to increase the likelihood of sustainability. 20% cash contributions have been collected for WSSs in rural Ethiopia including the SNNPR and have proven to be affordable.[44]

The preliminary cost estimates for the five scenarios are presented below.

5.8.1 Scenario 1

Scenario 1 presents a five year project including solar energy pilot and preparatory phase to be completed by the same Project Implementer over a period of five years, with 11 WSSs including solar pump.

Table 5.8: Estimated cost of proposed scenario 1

#	Description	Unit	# Units	Unit/cost Birr	Cost ETB	Cost €
1	**Project Implementer**	ls	1	15,000,000	**15,000,000**	**606,796**
2	**Hydro/Geological Survey** Geological and Hydrogeological study and mapping, Geophysical research and Data Evaluation	ls	11	200,000	**2,200,000**	**88,997**
3	**Project and Design** and project documentation of hydrogeological well, spring protection, Water distribution system, Water treatment design	ls	11	200,000	**2,200,000**	**88,997**
4	**Construction** Drilling of hydrogeological well, Spring development, Material and construction transport, Construction equipments and tools, Water distribution system construction including protection, 1 Solar pump with equipment, Testing and analyses, Hydrodynamic tests, Chemical analyses, Pilot test of water supply system	nos	11	3,850,000	**42,350,000**	**1,713,188**
5	**Construction supervision:** Supervision of construction works	nos	11	30,000	**330,000**	**13,350**
6	**Health and Hygiene promotion:** Simple KAP survey; building up knowledge; raising awareness on possible negative effects of current attitudes; supporting the introduction of improved practices in sanitation and hygiene	ls	1	6,000,000	**6,000,000**	**242,718**
7	**Community development for improved sustainability:** Community mobilization**,** needs assessment; organizing water users representations, creating basis for good governance; tariff setting, approval and effective collection mechanism; capacity building for technical and non-technical aspects of O&M; support to cooperation with strategic partners; self-monitoring and planning	ls	1	6,000,000	**6,000,000**	**242,718**
	TOTAL				**74,080,000**	**2,996,764**
	TOTAL minus 30% community + Woreda contributions to construction cost *513,956 €*					***2,482,808***

Notes

- The cost estimate is only based on current prices in 2011 in the Sidama Zone. The final preliminary cost of the project depend on the specification resulting from technical survey and quotations and the date of implementation; (inflation in June 2011 was 38.1 percent).
- The cost of community development + health and hygiene promotion is calculated as 30% of the construction cost
- Exchange rate: 1 € = 24.72 ETB (June 2011)

[43] Based on Ethiopian standards for number of users by type of WSS summarized in section 3.2 of the report

[44] Consultant's own experience

5.8.2 Scenario 2

Scenario 2 presents one 2.5 year project that can be completed by one implementer, including solar energy pilot and excluding preparatory activities that will be implemented separately by the CDA.

Table 5.9: Estimated cost of proposed scenario 2

#	Description	Unit	# Units	Unit/cost Birr	Cost ETB	Cost €
1	**Project Implementer**	ls	1	7,500,000	**7,500,000**	**303,398**
2	**Geophysical research and Data Evaluation**	ls	5	50,000	**250,000**	**10,113**
3	**Detailed Project documentation** of hydrogeological well, spring protection, Water distribution system, Water treatment design	ls	5	160,000	**800,000**	**32,362**
4a	**Construction** Drilling of hydrogeological well, Spring development, Material and construction transport, Construction equipments and tools, Water distribution system construction including protection, Testing and analyses, Hydrodynamic tests, Chemical analyses, Pilot test of water supply system	nos	5	3,850,000	**19,250,000**	**778,722**
4a	**Construction** 1 Solar pump with equipment	nos	1	300,000	**300,000**	**12,136**
5	**Construction supervision:** Supervision of construction works	nos	5	40,000	**200,000**	**8,091**
6	**Health and Hygiene promotion:** Simple KAP survey; building up knowledge; raising awareness on possible negative effects of current attitudes; supporting the introduction of improved practices in sanitation and hygiene	ls	1	2,900,000	**2,900,000**	**117,314**
7	**Community development for improved sustainability:** Needs assessment; organizing water users representations, creating basis for good governance; tariff setting, approval and effective collection mechanism; capacity building for technical and non-technical aspects of O&M; support to cooperation with strategic partners; self-monitoring and planning	ls	1	2,900,000	**2,900,000**	**117,314**
	TOTAL				**34,100,000**	**1,379,450**
	TOTAL minus 30% community + Woreda contributions to construction cost *233,617 €*					***1,145,833***

Notes

- The cost estimate is only based on current prices in 2011 in the Sidama Zone. The final preliminary cost of the project depend on the specification resulting from technical survey and quotations and the date of implementation; (inflation in June 2011 was 38.1 percent).
- The cost of community development + health and hygiene promotion is calculated as 30% of the construction cost
- Exchange rate: 1 € = 24.72 ETB (June 2011)

5.8.3 Scenario 3

Scenario 3 presents a 2.5 year project that can be completed by one implementer, excluding solar energy and excluding preparatory activities that will be implemented by the CDA.

Table 5.10: Estimated cost of proposed scenario 3

#	Description	Unit	# Units	Unit/cost Birr	Cost ETB	Cost €
1	**Project Implementer**	ls	1	7,500,000	**7,500,000**	**303,398**
2	**Geophysical research and Data Evaluation**	ls	5	50,000	**250,000**	**10,113**
3	**Detailed Project documentation** of hydrogeological well, spring protection, Water distribution system, Water treatment design	ls	5	160,000	**800,000**	**32,362**
4	**Construction** Drilling of hydrogeological well, Spring development, Material and construction transport, Construction equipments and tools, Water distribution system construction including protection, Testing and analyses, Hydrodynamic tests, Chemical analyses, Pilot test of water supply system	nos	5	3,850,000	**19,250,000**	**778,722**
5	**Construction supervision:** Supervision of construction works	nos	5	40,000	**200,000**	**8,091**
6	**Health and Hygiene promotion:** Simple KAP survey; building up knowledge; raising awareness on possible negative effects of current attitudes; supporting the introduction of improved practices in sanitation and hygiene	ls	1	2,900,000	**2,900,000**	**117,314**

7	**Community development for improved sustainability:** Needs assessment; organizing water users representations, creating basis for good governance; tariff setting, approval and effective collection mechanism; capacity building for technical and non-technical aspects of O&M; support to cooperation with strategic partners; self-monitoring and planning	ls	1	2,900,000	**2,900,000**	**117,314**
	TOTAL				**33,800,000**	**1,367,314**
	TOTAL minus 30% community + Woreda contributions to construction cost *233,617 €*					***1,145,833***

Notes

- The cost estimate is only based on current prices in 2011 in the Sidama Zone. The final preliminary cost of the project depend on the specification resulting from technical survey and quotations and the date of implementation; (inflation in June 2011 was 38.1 percent).
- The cost of community development + health and hygiene promotion is calculated as 30% of the construction cost
- Exchange rate: 1 € = 24.72 ETB (June 2011)

5.8.4 Scenario 4

Scenario 4 presents a 3 year project that can be completed by one implementer, excluding solar energy and excluding preparatory activities that will be implemented by the CDA.

#	Description	Unit	# Units	Unit/cost Birr	Cost ETB	Cost €
1	**Project Implementer**	ls	1	3 500 000	**3 500 000**	**141 586**
2	**Geophysical research and Data Evaluation**	ls	2	50 000	**100 000**	**4 045**
3	**Detailed Project documentation** of hydrogeological well, spring protection, Water distribution system, Water treatment design	ls	2	160 000	**320 000**	**12 945**
4	**Construction** Drilling of hydrogeological well, Spring development, Material and construction transport, Construction equipments and tools, Water distribution system construction including protection, Testing and analyses, Hydrodynamic tests, Chemical analyses, Pilot test of water supply system	nos	2	3 850 000	**7 700 000**	**311 489**
5	**Construction supervision:** Supervision of construction works	nos	2	40 000	**80 000**	**3 236**
6	**Health and Hygiene promotion:** Simple KAP survey; building up knowledge; raising awareness on possible negative effects of current attitudes; supporting the introduction of improved practices in sanitation and hygiene	ls	1	1 155 000	**1 155 000**	**46 723**
7	**Community development for improved sustainability:** Needs assessment; organizing water users representations, creating basis for good governance; tariff setting, approval and effective collection mechanism; capacity building for technical and non-technical aspects of O&M; support to cooperation with strategic partners; self-monitoring and planning	ls	1	1 155 000	**1 155 000**	**46 723**
	TOTAL				**14 010 000**	**566 748**
	TOTAL minus 30% community + Woreda contributions to construction cost *93 447 €*					**473 301**

Notes

- The cost estimate is only based on current prices in 2011 in the Sidama Zone. The final preliminary cost of the project depend on the specification resulting from technical survey and quotations and the date of implementation; (inflation in June 2011 was 38.1 percent).
- The cost of community development + health and hygiene promotion is calculated as 30% of the construction cost
- Exchange rate: 1 € = 24.72 ETB (June 2011)

5.8.5 Scenario 5

Scenario 5 presents a 3 year project that can be completed by one implementer, including solar energy and excluding preparatory activities that will be implemented by the CDA.

#	Description	Unit	# Units	Unit/cost Birr	Cost ETB	Cost €
1	**Project Implementer**	ls	1	3 500 000	**3 500 000**	**141 586**
2	**Geophysical research and Data Evaluation**	ls	2	50 000	**100 000**	**4 045**

3	**Detailed Project documentation** of hydrogeological well, spring protection, Water distribution system, Water treatment design	ls	2	160 000	**320 000**	**12 945**
4a	**Construction** Drilling of hydrogeological well, Spring development, Material and construction transport, Construction equipments and tools, Water distribution system construction including protection, Testing and analyses, Hydrodynamic tests, Chemical analyses, Pilot test of water supply system	nos	2	3 850 000	**7 700 000**	**311 489**
4a	**Construction** 1 Solar pump with equipment	nos	1	300 000	**300 000**	**12 136**
5	**Construction supervision:** Supervision of construction works	nos	2	40 000	**200 000**	**8 091**
6	**Health and Hygiene promotion:** Simple KAP survey; building up knowledge; raising awareness on possible negative effects of current attitudes; supporting the introduction of improved practices in sanitation and hygiene	ls	1	1 155 000	**1 155 000**	**46 723**
7	**Community development for improved sustainability:** Needs assessment; organizing water users representations, creating basis for good governance; tariff setting, approval and effective collection mechanism; capacity building for technical and non-technical aspects of O&M; support to cooperation with strategic partners; self-monitoring and planning	ls	1	1 155 000	**1 155 000**	**46 723**
	TOTAL				**14 430 000**	**583 738**
	TOTAL minus 30% community + Woreda contributions to construction cost *97 088 €*					**486 650**

Notes

- The cost estimate is only based on current prices in 2011 in the Sidama Zone. The final preliminary cost of the project depend on the specification resulting from technical survey and quotations and the date of implementation; (inflation in June 2011 was 38.1 percent).
- The cost of community development + health and hygiene promotion is calculated as 30% of the construction cost

5.8.6 Increasing access, acquisition of additional funds

With options 2 or 3, number of beneficiaries to be covered by the two 2.5 year projects, estimated on the basis of proposed engineering solutions and Ethiopian standards for number of users by type of WSS[45] is about 26,000 or 9% of the Woredas' total population. Already covered are 47% (according to the Zone) or 27% (according to the Woredas). This means that the project could increase access to a total of 36%-56%. This is considered relatively low for a visible impact.

Considering the principle *"do it once and right",* it is recommended to acquire additional funds so to increase the total coverage to some 90% (assuming that SC USA and the Woredas will continue constructing low cost –low maintenance WSSs that will also contribute to the total coverage.

Ideally co-financing would be sought from partners already active in the sector in Ethiopia or by refocusing implementation of other sectors within Czech Development Cooperation relevant to the project. Alternatively funding could be sought from the private sector and civil society. These proposals are elaborated further below.

The DAG TWG, co-led by UNICEF and the Italian Development Cooperation, brings together a large number of donors active in WASH sector in Ethiopia. These donors are multi-lateral lending agencies such as IFAD and the World Bank, multi-lateral agencies such as GIZ and the Dutch Government, as well In light of the proposed WASH Implementation Framework (WIF) and the consequent pooling of funding it will be crucial to enquire with each and every one of the current members of the TWG whether they would be willing and able to provide co-funding, how much, and under what conditions. This work could be done by a delegated consultant charged specifically to initiate these dialogues and to raise the funds.

Alternatively, the same consultant is proposed to spend time enquiring with Czech and Ethiopian industries whether they have Corporate Social Responsibility (CSR) funds available and whether they would want to enter into a PPP contract with the CDA.

Finally, as an innovative solution it is suggested that the tender for the PI include the ability of the bidding candidates to develop a credible strategy for the acquisition of additional funding. This would not weigh heavily in the scoring of the proposals, but could make a significant difference.

[45] Number of beneficiaries for solar system is not included in the Standards and has been estimated by the consultant at 500

The co-financing even if limited, broadens the exposure and the support for the Czech approach, and improves the likelihood of implementing more schemes.

5.9 Maximizing local ownership

5.9.1 Establishing legal owner of the WSSs

It is commonly understood that the communities (represented by WASHCOs) are the owners of the WSSs, supported by the Kebele and Woreda administrations. Since the WASHCOs are not legal entities and there is no legal basis for such ownership, the communities are not legal owners and do not necessarily perceive themselves as such; there is a tendency to rely on the Kebeles or on the NGOs who constructed the WSSs. The Kebeles are willing to provide the necessary support but may lack staff and budget to buy spare parts and to pay per diems and travel expenses to their workers.

NGOs hand schemes with inventories over to the local authorities (RBWM&E) and cannot be called responsible for O&M after the formal handover.

The absence of legal owner demonstrates itself in often poor operation and maintenance and weakens the likelihood of sustainability.

Working with communities and community ownership and management are high on the agenda of the authorities. *Legal formalization of ownership is foreseen as soon as the law on WASHCOs is approved in the SNNPR.*

5.9.2 Definition of duties and responsibilities

MOUs signed at the SNNPR level between the RBWM&E, BOH, BOE and BOFED clearly stipulate the roles and responsibilities of the partners.

The next step will be to formalize the duties and responsibilities of WASH partners at the local (Zone, Woreda and Kebele) levels with *MOUs signed by the WASHCOs clearly defining the duties and responsibilities, based on the actually available funds and capacities.*

5.10 Cross cutting issues

5.10.1 Environmental sustainability

Groundwater is one of the major water supply sources for rural and towns water supply in Ethiopia, which does not get affected due to slight changes in the climatic conditions as compared to surface water resources. Only long persisting changes in the weather or the climate can have impact on the groundwater resources and due to groundwater resources appear to be most suitable and environmental sustainable for further exploitation.

When building a water sources to ensure safe water supply for the population it is necessary to apply consistent approach in terms of environmental sustainability. This approach is applied through water resource planning and management, which have to be based on information about groundwater occurrence distribution, its quality and quantity. This is especially knowledge of groundwater circulation and its quantitative and qualitative protection.

Groundwater quality protection is mainly the protection of the infiltration area of hydrogeological structure as a whole, and its design to prevent activities related to the potential possibility of groundwater contamination, and also the protection of individual groundwater sources.

To ensure ground water protection, geological and hydro-geological mapping is instrumental for sustainable groundwater resources development and management. Hydrogeological maps at larger scales are indispensable for knowledge of hydrogeological structures; these large scale maps are further elaborated in detailed scale for groundwater source protection design.

Catchment protection and environmental safeguards are increasingly becoming important due to possibilities of climate change and uncontrolled human activities that are affecting both water quantity and quality. In the infiltration area, catchment protection includes among others the gully protection works, contour terracing or tree plantation. In the vicinity of individual water source proper fencing and gulley/flood protection around the water sources as well as their location reasonably far away from agricultural fields, sanitary landfills, toilets and other measures in accordance with hydrogeological recommendations for sanitary zone protection are necessary.

Qualitative protection, as environmental sustainability tool, ought to be managed particularly from Woreda Water Office level, based on recommendations/requirements of hydrogeological study described in detail in Operation Manual and Protective Zone of the Water Source (to be prepared under the proposed project). Qualitative protection ought to be provided, due to the need for a comprehensive solution, from Sidama Zonal Department for Water, Mines and Energy, where sufficient professional staff is available.

In terms of quantitative protection it is especially balance of groundwater reserves in hydrogological structure determined for long-term exploitation, and also the subsequent records of groundwater outputs from this structure. The basis of groundwater reserves balance, except the knowledge about geological conditions and hydrogeological structures, is quantitative assessment of water conditions on the input and output of the hydrogeological structure, evaluation of static and dynamic components of groundwater resources and monitoring of the structure focused on verification of input assumptions and acquirement of information from the field as a feedback for future exploitation.

5.10.2 Gender equality

Coverage levels for water and sanitation in Ethiopia are among the lowest in the world. Estimates indicate that only some 31% of HHs has access[46] to safe water and 18% to sanitation facilities. Water quality is another major problem; contamination of water by cattle and human excreta is frequent. Lack of potable water and lack of proper sanitation facilities is a typical cause of parasitic, bacterial and viral diarrheas causing infant and child mortality. The low levels of water and sanitation coverage have important economic and social implications.

Water-related tasks are typically divided between women and children who spend considerable time fetching and transporting water often over long distances on the one hand and men who are making decisions about WSSs including their management and operations on the other hand. It is usually women who care about the sick.

Photo 5.4: Discussing water source

Photo 5.5: Fetching water

Source: consultant's own photos

The proposed project can contribute in several ways to equalizing the roles and to improving quality of life for women and children.

Involving women in decision making for improved sustainability

Major decisions about water supplies including technology, financing, locations as well as operation and maintenance are made by men. This is symptomatic for the communities, government institutions/WASH structures as well as for NGOs or donor agencies[47]. Women, responsible for supplying water to the household, washing, cooking, cleaning, personal hygiene of the children, looking after the sick, have a major stake in the

[46] Defined in Ethiopia as 15 l /person/day within 1.5 km or 30 minutes walking distance for rural areas

[47] During their meetings and interviews in Ethiopia, the consultant very rarely met with women in decision making positions

proposed project. From the consultant's experience, there is a positive correlation between number of women in decision making positions and the likelihood of sustainability of water supplies, in Ethiopia and elsewhere. The government has already made a step forward in this direction by creating the positions and appointing women HEWs at the Kebele levels.

Women's share can be increased in several ways:

- Formation of WASHCOs: Women are typically under-represented and occupy positions of cashiers and accountants. Proposed community development activities (section 5.6) should include sensitization to women's roles in WASH - existing and potential- and benefits anticipated from their empowerment. While the WASHCOs are and should be elected by the community, improved awareness and possible resulting social pressure could lead to not only increasing the share of women but also to their election as chairpersons, care takers, technicians, still leaving the roles of cashier (that brings them in regular contact with the water users) in their hands.

- Ensuring that women have a voice (and that the voice is heard) in making informed decisions about technologies, distribution systems, design of outlet facilities, tariffs, tariff collection or issues related to operation and maintenance.

- Facilitating women's direct involvement in implementation and financial management of preventive maintenance and repair works, as care takers, technicians and/or chairpersons of WASHCOs.

- The proposed project should ensure that the community development team (own or sub-contracted) is comprised mainly of and lead by a woman.

- Women in existing positions within the WASH structures or within the RBWM&E and the SZDWM&E should be encouraged to closely cooperate with the project. This could strengthen their position within their respective organizations as well as contribute to a dialogue between the women in the communities or WASHCOs and the decision makers.

Socio-economic benefits
Decreasing the time to fetch water and improving water quality will benefit mainly women and children.

Women could use the time savings to care for children in the home or employment in income generating activities.

Traveling long hours to remote sources exposes girls to increase rates of abduction and rape; by creating access in reasonable distance would decrease this risk.

For girls and boys, the task of carrying water combined with lack of sanitary facilities in schools and DALYs due to WASH diseases often stand in the way of their education. Improved access to clean water can contribute to better school attendance and ultimately better education and the possibilities to move to higher educational facilities.

5.11 Sustainability

Factors influencing sustainability have been grouped in to four (interlinked) categories:

- Organizational
- Cooperation with partners
- Economic
- Technical

All these factors can be monitored by the water users and the representatives they elect for management and operation of their systems.

It is considered important to monitor the sustainability factors and to address potential major issues from the very beginning.

The issues and mitigating options in the tables inserted in each sub-section are indicative. Scheme-specific issues need to be defined and a systematic sustainability monitoring and reporting mechanism developed at the early stages of the project. Ideally, such mechanism should be appropriate for self-monitoring and reporting by the communities, developed jointly with them and feed in to the project and ultimately government MIS.

It is recommended to set up, at the very beginning of the project a participatory (self-) monitoring and planning mechanism to raise awareness and introduce timely mitigation measures to increase the likelihood of sustainability before, during and after implementation.

5.11.1 Organizational (WASHCOs)

WASHCOs in SNNPR are not legal entities; there is no legal owner of the WSSs. Division of roles and responsibilities at the local level (Woreda and below) in unclear. These are key issues related to sustainability that need to be addressed and resolved. The proposed project could play facilitating role in resolving them.

Table 5.11: Issues and mitigation measures related to organizational sustainability of WASHCOs

Issues	Mitigation options
WASHCOs are not legal entities – cannot enforce by-laws, (are also not considered private sector).	Lobbying for approval and proclamation of the law on WASHCOs by the SNNPR to give them legal status (already implemented in Beni Shangul and Tigray Regions). This will enable them to enforce by-laws, take measures against defaulters and to take micro-finance loans. Community Development Fund exists in the Amhara Region) and is accepted by the Federal Government. Similar approach could be considered for piloting in Sidama. Formalizing legal ownership of the WSSs Exploring the possibility of support to formation of WASHCO associations (only if such association is initiated by the WASHCOs themselves; associations formed "top-down" are typically not effective and not sustainable)
WASHCOs are in general weak and not well organized. Division of roles and responsibilities at the local (Woreda and below) levels is not clear; in some WASHCOs, members from Kebele are included.	Prior to their formation, the roles and responsibilities of WASHCOs, the Kebeles and the Woredas need to be clarified and described. Duties and responsibilities should be described in the WASHCO by-laws to be approved by the community (general assembly). Results-based performance monitoring of WASHCOs should become part of the sustainability (self-) monitoring mechanism.
Lack of community participation in planning including choice of technologies	Keeping WASHCOs and the communities informed and facilitate their active participation in decision making including informed choice of technology. Providing training and capacity building in technical and non-technical subjects including book keeping and accounting, management, interaction with the water users and partners.
People do not trust the WASHCOs, may not be aware of their mandate, duties and responsibilities due to the lack of good governance, transparency and accountability vis-à-vis the water users.	Facilitating formation of WASHCOs at the onset of the proposed project, from representatives trusted by the community and elected on the basis of their competence and integrity. Focusing capacity building and training activities on issues such as the need for regular meetings, for financial reports and tariffs explained to, approved and available for checking by the water users. The by-laws should provide for the option of replacing members who do not enjoy trust or whose performance is considered weak. Peer-to-peer mentoring: Inviting managers of successful schemes from the zone/region during the formation of WASHCOs or for consultation on specific issues.
People complain about WASHCOs' performance	Creating redressal mechanism- complaints windows- at the different levels: WASHCO, Kebele, Woreda, Zone and Region. Recording complaints and their follow-up in the monitoring mechanism up to the Regional WASH MIS that could eventually feed in to the National WASH MIS[48]
Women are under-represented, possible female members are cashiers and/or accountants	Sensitization to the role women play in improving sustainability. Promoting women membership in WASHCOS, also in managerial positions. Support to the women staff of cooperating partners. Promoting women as care takers and operators – training in technical skills.

5.11.2 Cooperation with partners

Section 2.2.9 Stakeholder Issues of the 2001 Water Sector policy specifically encourages identification of relevant stakeholders, creating for discussions and consultations, developing a framework for PPP, promoting private sector participation and providing a framework for coordinating and monitoring their activities.

[48] Such system has been exists for example for NREGA – a flagship investment program in India.

Cooperation, dialogue, sharing of experiences with and enlisting support from partners including government entities or WASHCOs/management organizations of sustainable WSSs has proven an effective way to improving the likelihood of sustainability in different projects, particularly where the projects are implemented by donors or NGOs and have a definite time span.

It is important that such working relationships are formed between the WASHCOs and the respective organizations; the project can play a supportive role in facilitating and supporting such relationships.

Table 5.12: Issues and mitigation measures related to cooperation between WASHCOs and partners

Issues	Mitigation options
Lack of resources, awareness and coordination	Facilitating identification, by the WASHCOs, of existing and potential partners. This would include sharing available information on "who is who" in the sector at the different levels to include potential partners that are new to the WASHCOs Facilitating conclusions, by WASHCOs, of their possible roles in the O&M of the WSSs. Supporting establishing of contacts with selected partners and networking.
People complain about delayed responses to requests for support in maintenance; low quality of services.	Supporting, for partners-service, goods and works providers- performance monitoring system (this could eventually become part of the WASH MIS). If government is responsible, government commitment is a pre-requisite for improvements.
High turnover of Woreda staff	This is symptomatic for government organizations and out of control for the WASHCOs. A possible approach is focusing cooperation on strategic and policy issues and complementing with partners from the private sector and building own capacities.

5.11.3 Economic (cost recovery)

Payment of tariff is typically the most critical sustainability issue. Reasons can include: (i) A normal human behavior**:** Wait and see what happens if you do not pay. (ii) Clean drinking water is not a top priority because people have private wells or access to optional sources of water (this can be a seasonal issue). (iii) People contributed to the investment cost but the system does not extend to their area or does not provide agreed level of services. (iv) Frequent break downs; water supply is limited or unreliable. (v) The community does not have an effective system for management of tariff collection. (vi) Water users are not informed how the money is used and do not trust the WASHCO.

It is important to properly understand the reasons as well as the willingness and limitations of the communities to address and to solve them. Tariff Study may be implemented to get deeper understanding of the reasons and background to design measures focused on solving the project specific reasons. Such measures can be introduced at the PI level (monitoring of tariff payments) as well as in the communities (who can for example design and implement measures against defaulters, decentralize tariff collection or involved local partners for support).

The consultant proposes setting tariffs to cover both the cost of O&M as well as depreciations. This may be prohibitive for some communities. In such instances, one option is to introduce a system of regular Woreda contributions of amount calculated to cover depreciations of components designed to last one year or longer to an account established for this purpose. A separate payment schedule would need to be prepared.[49]

Table 5.13: Issues and mitigation measures related to economic sustainability

Issues	Mitigation options
People are not willing to pay for communal water supply services from protected springs and hand dug wells.	Water schemes should not be constructed without a strong evidence of perceived need (demonstrated by written request including proposed organization and evidence of cash contributions to the construction cost). Preparing and making accessible to each household in the community itemized detailed tariff with unit cost based on 100% cost recovery. Facilitating discussions on the tariff, the need to cover the cost and the consequences of defaults in tariff collection. Getting a full O&M cost recovery tariff approved by representative majority of water users before beginning of

[49] The 2001 Ethiopian Water Sector Policy section 2.2.5 sub-section B paragraph 6 stipulates that "….the basic human needs of water for disadvantaged rural communities who cannot afford to pay for development of water systems, shall be borne by the government, as appropriate, and in so far as the communities are able and willing to cover the operation and maintenance cost on their own."

	construction. Supporting WASHCOs' capacity in correct financial management and monitoring (book keeping, accounting, record keeping, issuing of receipts), external audit and transparent regular reporting to the water users. Updating and approving tariff on annual basis.
Efficiency of collecting tariffs. There are defaulters rates can go reportedly up to 50%. Causes can include weakness in tariff collection system, as well as lack of trust and suspicions of misappropriation due to lack of transparency.	Enacting law on WASHCOs that will i.a. enable them to enforce by laws. Facilitate good governance of WASHCOs – accountability and transparency (for each payment there should be a receipt with a copy kept by WASHCO, list of water users for monitoring of payments.
Willingness to pay depends largely on availability of other sources (rivers, streams, lakes).	Proper needs assessment to establish sufficient level of confidence in tariff collection. Cash contribution in the form of a bank deposit to the net investment cost prior to signing works contract and commencement of construction. IEC on the benefits of clean drinking water In areas where optional sources disappear during the dry season, tariff during the dry season can be calculated so as to cover the annual O&M requirements.
The water point does not generate income for cost recovery.	Tariff Study may be implemented to get deeper understanding of the reasons and background to design measures focused on solving the project specific reasons The annually revised and approved tariff must cover 100% of the full cost of O&M plus reserve fund for repairs and replacements. WASHCOs regular monitoring of tariff collection rates. Publishing lists of defaulters in public places (schools, Kebele office and other meeting places). Clear definition of sanctions in the approved by- laws. Enforcing sanctions foreseen in the by-laws, enlisting support of project partners.
Ability to pay. According to different governmental and non-governmental sources including kebeles and communities, the share of households not able to pay the current water tariffs is does not exceed 3% in Sidama[50].	Communities should be fully informed about the cost of O&M and the consequences of non-recovery. Structuring of tariffs within the community (poor-not poor, households, institutions) should be left to the community and agreed by general assembly, recorded in a signed document and kept in the WASHCO's MIS.
Current basis for establishing water rates is not clear. The current government policy for rural water supplies stipulates that the tariff for rural water supplies should cover the cost of operation and maintenance. The calculations of such cost are however not available. No templates, procedures or guidelines for tariff calculation were available at the visited Woreda offices. Funds collected by the communities or received by Woredas are currently not sufficient for operation, repair and maintenance with the result that the WSSs fall gradually into disrepair.	Proper calculation of water tariffs based on cost recovery, including reserve fund for major repairs, salaries, cost of fuel/electricity. Publication of the tariff within the community. Information campaign and facilitating dialogue within the community to reach a consensus on amount and collection modalities. Regular (annual) tariff updates based on monitoring of income and expenditure. Should the tariff be prohibitive for poor families, (estimated 3%), alternatives are to be identified by the communities. One option is to introduce a system of regular Woreda contributions of amount calculated to cover depreciations of components designed to last one year or longer to an account established for this purpose. A separate payment schedule would need to be prepared.[51].

5.11.4 Technical

The key technical aspects of rural water, sanitation hygiene promotion services that are challenging the sustainable functionality include: insufficient community consultation, dialogue, and consensus building, lack of rigorous program study and design, and construction which leads to premature mal-functioning of the services, lack of framework and capacity to monitor the depletion rates of water resources and degradation of their quality, catchment protection and development, adequate and job related training and refresher course, access to spare parts supply chain, insufficient back up support to WASHCOs from the Woreda, Zone and Regional WASH entities, as well as the absence of clear and realistic income - expenditure plan for short-, medium- and long-term periods.

Further studies and assessments, focusing on key issues and possible solutions are required. The proposed project will undertake hydrogeological and engineering studies to determine reliable water sources and appropriate technical solutions. In case of schemes with power driven pumps, the design will consider cost of

[50] Current tariffs: Hand pumps 1-5 ETB/family/month; 0.20- 0.50 ETB per 20l

[51] The 2001 Ethiopian Water Sector Policy section 2.2.5 sub-section B paragraph 6 stipulates that "….the basic human needs of water for disadvantaged rural communities who cannot afford to pay for development of water systems, shall be borne by the government, as appropriate, and in so far as the communities are able and willing to cover the operation and maintenance cost on their own."

operation and where cheaper and feasible, renewable sources of energy such as the national power grid and solar energy will be considered.

Lack of spare parts is the most frequently reported issue impacting on technical sustainability. There are some on-going pilots in Sidama initiated by JICA and SC USA. They use different approaches: SC USA supports establishing spare part shops either through private entrepreneurs who are willing to provide such service or through the nearby town water services. On the basis of lists produced by the WASHCOs, spares are purchased in bulk and stored in the shop and sold to WASHCOs with marginal profits. Cooperation and linking with these initiatives could provide solution to this issue.

WASHCOs include care takers and community level technicians responsible for the operation and maintenance of the WSSs facilities. They are also potential promoters for improved hygiene and sanitation, in particular proper maintenance of the sanitary zone and the safe water chain.

The proposed project will provide opportunities for capacity building and training to partners on issues relevant for improving technical sustainability. This will include assurance of construction quality, tariff setting and monitoring of water resources. Links and clear division of duties and responsibilities are important elements of the capacity building activities.

The RBWM&E and the ZDWM&E are responsible for monitoring water resource potential, depletion and quality deterioration and the project will cooperate with them closely on these issues.

Table 5.14: Issues and mitigation measures related to technical sustainability

Issues	Mitigation options
Lack of spare parts. The current practice is that the government provides spare parts or the WASHCO buy spare parts at the local market. There is no systematic approach marketing.	Presently some development partners (such as SC USA, Plan International, JICA ec.) are supporting the establishment of local spare parts shops. There are currently two types of approaches: Establishing spares store under the existing nearby town water supply services. The town water supply, with the technical support of the Woreda Office and with the list of needed spare parts from the WASHCO defines which spare parts are needed and how often. This will enable them to purchase in bulk and to sell the parts to WASHCOs when they need them. The project could assist with preparing a list of spares, quantities required and how often. The second option supported by JICA is to identify volunteer entrepreneurs, train them, and provide technical assistance, so that they can purchase spare parts from Hawassa or Addis Ababa and sell them to WASHCOs with marginal profit.
O&M, lack of skilled local technicians. O&M is done by local technicians who are often not sufficiently trained, lack tools and manuals.	Linking in to existing/supporting new programs for O&M in TVETs and courses for TVETs post-graduates (SNV provided capacity building to TVET in Hawassa, there may be other “pilots” or experiences of cooperation). Capacitate the Woreda WMER office in terms of skills, tools and equipment, so that the office can render back up support to the WASHCOs.
Preventive maintenance is not carried out properly and regularly, assets are not replaced once the end of their life span is reached. As a result, system wears out earlier than it should and major, expensive rehabilitation is required.	Facilitating mechanism for technical monitoring - regular technical check-ups and (written) reporting of possible problems by the responsible care taker or technician to the Head of WASHCO. If there are any problems, the Head of WASHCO should be responsible for ensuring remedy (procurement of running spares) or take them up with the Woreda if beyond his/her capacity.
Quality of services is sometimes poor	Improving design and construction quality assurance. Providing training, coaching, and back stopping technical assistance to the Woreda and zone technical staff. Adequate training, refresher course, and motivating incentive to the WASHCOMs and care takers (form of the latter to be decided by the community. Periodic inspection of operation and maintenance,
Choice of technology. Push is for low cost, may not always be appropriate and sustainable.	Mainly because of financial constraint, the government goes for low cost option (on spring development and HDW). And some local and even international NGOs also opt low and simple. However, low and simple in most cases doesn’t resolve the burden of disease and work load on mothers and children, because they are on spot supply. Schemes with reliable and adequate water sources (which can supply at least 2000 to 5000 people), schools and health institutions etc. would be rather cost effective.
Quality of construction (including survey); Quality of construction materials. Very important is quality of iron for casing and of all parts which are inside the borehole. Other materials, which are outside the well, are mostly accessible for necessary repairs but should be of quality that allows for long-term	Both can be resolved by choosing good implementing company (for survey, project, drilling and other construction-related activities) resulting from well prepared tender documentation and budget and particularly by good, responsible supervision of all parts of the project.

use.	
Design is not "user friendly" – the platform, no elevated space for the container or positioning of the outlet (pump, taps) do not take into consideration that water is usually collected by women and children. The pump/tapes break down due to unintentional wrong operation.	Consulting design with members of the community who are collecting water, following, as much as technically possible, their needs and priorities.

5.12 What works and how to do it

Sustainability can be achieved if the above principles of participatory decision making, ongoing dialogue and capacity building are followed. CS USA and LVIA shared with us lessons learned and good practices from their successful projects, reproduced in the Text boxes below.

Text box 5.1: Example of a sustainable water supply system from SC USA

Implementer:	SC USA
Funded by:	Community (about 17%) Italian private donors
Location:	Woliso Area/Woliso Woreda; Kalla Community Water Supply (spring source with distribution system, gravity flow design: the beneficiaries are mainly located downstream of the spring source)
Year of construction:	2005
Month and year of completion:	September 2005 – June 2005, with few expansions to other villages at the beginning of 2006.
Date of last visit by member of your organization:	2011
Findings on changed and developments during this last visit:	The community/Village WASH Committee are properly managing the system and hence it is still functioning without any other external support
Ownership:	Who was the owner after completion, who is the owner now? Both after the completion and now, it is the beneficiary community who owns this project
Type of technology:	Spring with distribution system
Type of energy:	Gravity flow system
Estimated number of beneficiaries:	This was originally about 1,500 but this figure has tremendously increased after the expansion work. The current actual figure is not captured recently.
What were access factors for its' sustainability:	Well, lots of issues contribute to sustainability of water supply systems. In this case, the following points have contributed to the sustainability of this scheme. **Appropriate Technology Choice:** We have made reference to a socio-economy of similar rural village and learnt that such rural community will not sustain motorized schemes due to the paying capacity and the technical knowledge for the continuous operation and maintenance of motorized schemes. The issue is that they need to either higher trained electrician who will operate their electrical submersible pumps and generators or they should fully train people from selves who will be sent to government TVTE colleges and get such technical training to fully manage the technical problems that are related to such electrical system. This has been a challenge even in most of our towns (some of my live experience with Kemisse town, which is a zonal town; Bati town, Senbete town, Chefa town…etc; all of them in Wollo65 province). Hence, having learnt from these experiences we have made study to search for potential spring source that can fully supply water to the community. Though it is at the farthest upstream, we have found a spring source with sufficient yield to supply water to the Kalla community. The spring was located at a sufficiently higher elevation that we are able to construct gravity flow pipe systems to each of the sub-village with their own water points, from where they can collect water. Hence, technology choice was one of the key issues for its sustainability. **Proper community mobilization to ensure demand based project implementation:** the community was properly mobilized from the very begging of the project idea initiation. The community assigned their representatives (Committees) who have continuously worked with our team starting from the beginning until the end of the construction. In the process, it was discussed that community contribution was a mandatory for the scheme to be constructed. Because the community was in real need, they have agreed to contribute at least 10 to 15% of the project cost in different ways (cash, labour, local material). At the end of the project, I remember that it was nearly 17% that the community has contributed to the water supply system construction. **Sufficient capacity building to village WASH Committees:** We have made continuous capacity building that will enable them to manage their schemes within their skill and knowledge, with no or very few support from external technicality. **Establish linkage with Woreda Water Bureau and Kebele Administration system:** We have learnt from our different experiences that some Village WASH Committees don't exert their full responsibility, though all the necessary trainings given to them. They lack commitment to what they have taken responsibility on the behalf of the community. In most cases, when a trained village WASH Committee doesn't exercise its role and responsibility, the community will simply replace with other member selected from the community. But, there should be some sort of agreement from the very beginning that punishment be in place when any one of the committee member is not doing what is expected from him/her. For this reason, we have given training and orientation on such issues to the Kebele Administration people so that they will be able to punish committees who are not properly playing their role and responsibility. Because time and money has been wasted to train them. For major technical supports, that goes beyond the capacity of village based scheme-care-takers, the Woreda Water bureau need to assist them. Hence, this has also been properly linked. **Work on really needy community and do the work with really committed staff**

SC USA has been working in Sidama since 2003 with focus on health and emergency response projects. Their current activities in Loka Abaya include expansion of existing WSSs and sanitation and hygiene promotion in 4 kebeles in *woyena dega.* This WASH project signed between SC USA and the SNNPR region in September 2010 is focusing on hand-dug wells, springs, rehabilitations and pipe expansions. In Aleta Chuko, SC USA is constructing 3 springs in 4 Kebeles and implementing 17 CLTS villages in 2 Kebeles. Their approach is integrated and strictly participatory. The NGO is currently not doing any drilling in Sidama. SC USA is interested in cooperating with the CDA/the proposed project.

Text box 5.2 Example of a sustainable water supply system from LVIA

Implementer:	LVIA
Location:	SNNPRS region/Hadaya zone; Shashego Woreda/Gola village
Year of construction:	2005
Month and year of completion:	September 2005
Date of last visit by member of your organization:	November 2007
Findings on changed and developments during this last visit:	No changes
Ownership:	Peasant association – Water Management Committee
Type of technology:	Hand dug shallow well equipped with hand pump
Type of energy:	No energy required – manual system
Estimated number of beneficiaries:	500 persons
What were access factors for its' sustainability:	**Financial/Economic Sustainability** The evaluation attempted to assess whether the services/outputs produced by the project intervention would be affordable for the final beneficiaries at the completion of the project. Accordingly, it was noted that beneficiaries/users of water supply scheme indicated that they have willingness and ability to afford water fee. **Technical and Social Sustainability** Evaluation of technical and social sustainability of the project was conducted through assessing the level of ownership of the project by beneficiaries and technical capacity of local actors to ensure continuity of project services/outputs after the end of the project support. In line with this, the findings of the evaluation in terms of sense of ownership of communities for the project outputs (including equipment, infrastructure, etc) revealed that: • There has been good sense of ownership of local communities for water supply scheme. **Institutional and Managerial Sustainability** During the evaluation exercise, institutional and managerial sustainability of the project was assessed to examine how well the project has contributed to institutional and managerial capacity of its partners to ensure sustainability of project outputs/results. Accordingly, the analysis on how far the project embedded in the institutional structures in order to survive beyond the end of the project indicated that most of the project outputs were handed over to pertinent Woreda government offices, target CBOs and beneficiary communities. Despite poor capacity of the stakeholders at different levels, the handed over project outputs might have high possibility to be sustained institutionally. Assessment was also conducted on how well the project partners were being properly trained on managerial aspects to ensure project sustainability. The project has organized various training sessions for DAs, community & CBO leaders, and staff of government offices in relation to the management of the project outputs after the end of the external support. However, some individuals who were provided with managerial training might not serve the project outputs due to staff turnover, transfer, replacement, demotion, etc. It was attempted to assess the relations of the project with new or existing institutions and the capacity of the institutions to continue the flow of project benefits. Accordingly, it was noted that the project has good working relationship especially with target communities at grassroots level. However, there still some capacity gaps in the Woreda partner sector offices and at community levels to effectively ensure continuity and sustainability of the project initiatives in terms of logistics, finance, material and human resources.

Text box 5.3 Example of a sustainable water supply system from LVIA

Implementer:	LVIA
Location:	SNNPRS region/Alaha Special Woreda; Besheno village
Year of construction:	2006
Month and year of completion:	July 2006

Date of last visit by member of your organization:	November 2007
Findings on changed and developments during this last visit:	No changes
Ownership:	Water Management Committee – Woreda Water Office
Type of technology:	Deep well bore hole with distribution system
Type of energy:	Diesel generator
Estimated number of beneficiaries:	5.000 people
What were access factors for its' sustainability:	**Financial/Economic Sustainability** Alaba Woreda Water Resource Development Office and Besheno community were actively participated in the rehabilitation an extension of the water scheme through the provision of cash and labour for excavation and backfilling of pipeline trench. Accordingly the contribution of the community was estimated at 14,000 Birr (in cash) and the government contribution was valued at 60,000 Bi while the project contributed a total of 130,000 Birr. • **Water Tariff Estimation Besheno water scheme** **A. Generator running cost** 1. **Service**: a. Three services per year or once every 300 hrs. b. Oil tank volume = 14.5 liters/service = 14.5x3= 43.5lit/year c. For level control: 6lit/year. Total amount of oil per year = 49.5 liter d. present cost of oil= 22.5 birr per liter e. Cost of oil per year = 49.5x22.5 = 1113.7 birr. f. Estimated oil and fuel filter cost = 2x200x3 = 1200 birr/year g. Transport and perdiem 3 round trips to Alaba 3x50=150 birr/year h. Yearly service cost = 2463.7 birr **2. Maintenance:** **a.** Battery replacement: once/ 2year, cost 550 birr, per year: 275 birr b. Starter = 1 per two years, cost = 250 = 125 birr/year c. Dinamo repair cost, 700/7year = 100 birr/year d. 14 faucets are estimated to be changed on three water points, e. average cost of one faucet = 25birr, total= 350birr/year f. Yearly maintenance cost= 850birr g. Generator service & maintenance cost per year = 3133.7 birr h. Per month = 552.20 birr i. Per day = 18.4 birr **B. Man power** - Operator 1x75 = 75birr/month - Revenue collectors 3x75 = 225birr/month - Guard 1x50= 50 birr/month - Monthly total = 350.00 birr - Salary (expense/day) 11.60 birr **C. Fuel cost** Generator fuel consumption = 12.5 liters/hrs Generator running hrs = 2.5 hrs/day Fuel daily consumption = 31. 2 liters Fuel cost per liters as of August 2006 = 4.85 birr Fuel cost/day = 31.2x4.85 = 151.30 birr Total daily expense = (A+B+C) = 18.40+11.60+151.30 = 181.30 birr **Water Selling Tariff** Water consumption rate is taken from the dry season average, that is: Pumping hrs = 2½ hrs/day Pumping rate = 3.8 liter/sec Amount of water consumed per day = 2.5x3600 secx3.8=34200 lit/day. Deduct 200 lit/day as wasted water and consumption= 34000 lit/day. At present water is sold @ 0.15 birr per 25 liter jerican. The daily consumed 34000 liter = 1360 jerican of 25 liter volume Cost of 1 jerican of 25 liter V=0.15birr Therefore, 1360 x 0.15 = 204 birr daily water sales The estimated daily expense as running cost = 181.30 birr Daily income minus daily expense = 204-181.30 = 22.70 birr The daily remainder = 22.70 As unexpected and/or unforeseen expense may be considered as 10% of the daily reminder which is = 2.27 birr/day. Pure remainder = 20.43/day Monthly the remainder as profit = 612.90 birr/month However the consumption rate taken is not regular. During rainy season the water consumption and sales is very much less than the above estimate. If properly managed, the running cost can be kept lower when there is no good water sale. The number of workers and the salary rates can be adjusted. In general the above estimate shows that the water selling rate 0.15/lit jerican is normal. The rate is about 6birr/m^3.

	Technical and Social Sustainability The project has been undertaken and completed from May 15 to July 15, 2006 and involved 730 households. The features of the system before the improvement were the following: Source: Borehole, depth 320 m Yield: 5 liter per second at the well site Electric generator: capacity = 51kw Engine = Deuz In good condition Submersible pump: yield = 5 liters per second Pump position 300 m below ground level Generator house: in good condition Water tanks: Both tanks and stand in poor condition, need of replacement. Water distribution points: there were two water distribution points, one old with 14 faucets, partly working, and one new with 6 faucets, in need of improvement. Pipe line: 700 m of 1½" GI pipeline connecting the 6 faucet water point to the system at the borehole. The pipes have been extracted later to be used to connect the water point to the newly constructed main line passing nearby. The following improvement activities have been accomplished in collaboration with the Woreda WRO and the Besheno community: • Survey, design and cost estimation procedures performed including bill of quantities and purchase of items before starting the construction. • Constructed masonry/concrete tank stand large enough to accommodate two Geepee plastic water tankers • Supplied and installed two water tankers of 10,000 liter capacity each, total 20,000 liters. The structure is fenced with barbed wire • New reservoir site was selected as to ensure water flow by gravity to the clinic in the village and the school area. It has been also improved water pressure in water points • Installation of new pipes as following: 220 m of 2½" GI pipes from borehole to the new service water tankers; 1000 m of 2" GI main pipeline from borehole to centre of village • Extraction and reutilization of 700 meter existing pipeline that consisted of 2" GI pipes • Constructed a water point with eight faucets in the village centre and fenced • Constructed two valve chambers provided with lockable metal covers **Institutional and Managerial Sustainability** **Training of Besheno water management committee** The training aimed at strengthening the committee's awareness on duties and responsibilities and knowledge of contents listed below. The training lasted 4 days and was held at the beginning of August. Contents of training: 1. Technical training - System operation - Meter reading - Generator service - Maintenance of faucets and valve - Maintenance of fences 2. Bookkeeping and accounting - Bookkeeping/ bank account management - Water tariff calculation to be made on operation and maintenance costs like generator's running costs and minor repairs; manpower; water scheme minor maintenance 3. Auditing and financial reporting 4. Sanitation for water committee - Theoretical session related to the importance of safe drinking water, environmental sanitation, personal hygiene and sanitation requirements for water scheme and household water storage. 5. Practical session - Water meter reading for water tariffs collectors - Generator service for operator - Minor maintenance of water faucets, fences and water canals or ditches - Sanitation of water scheme and water points

Text box 5.4 Example of a sustainable water supply system from LVIA

Implementer:	LVIA
Location:	SNNPRS region/ Hadya zone; Mololicho and Suta village
Year of construction:	2006 - 2007
Month and year of completion:	March 2008
Date of last visit by member of your organization:	November 2010
Findings on changed and developments during this last visit:	No changes
Ownership:	Who was the owner after completion, who is the owner now? Water Management Committee

Type of technology:	Spring protection with distribution system
Type of energy:	No energy required – gravity system
Estimated number of beneficiaries:	12.000 people
What were access factors for its' sustainability:	**Financial/Economic Sustainability** The evaluation attempted to assess whether the services/outputs produced by the project intervention would be affordable for the final beneficiaries at the completion of the project. Accordingly, it was noted that beneficiaries/users of water supply scheme in Mololicho and Suta Kebeles of Shashogo Woreda indicated that they have willingness and ability to afford water fee. Accordingly, the water committee collected about Birr 795 (at a rate of one Birr per household per month) from three water points in the two Kebeles. However, it was learnt that water users at one of the water points who were located at the source the spring in Mololicho Kebele were reluctant to pay water fee which might be related to feeling ownership of the water being at the upper stream of the water source. **Technical and Social Sustainability** There has been good sense of ownership of local communities for water supply scheme in Mololicho and Suta Kebeles; **Institutional and Managerial Sustainability** The two 'kebeles' elected the members of the water management committee; and LVIA in collaboration with Woreda water office, offered a refresher training on management, technical aspects (repair and maintenance), accountancy, and sanitation to enable the community committee to participate during implementation, mobilizing the community members, and handle the water scheme after the handover. The spring water is expected to benefit more than 12000 people. **Training of water committee members, Mololicho and Suta kebele (date: 29/1/2007)** The training has been focused on duties and responsibilities of water committee: 1. The committee's members are expected to advocate a clean environmental hygiene and sanitation 2. Sanitation and proper usage of water scheme In particular: - Personal Hygiene - Keeping of water quality - Avoiding dirty/waste material to pollute water source - Fencing water scheme - Keeping away the cattle from water point - Do not excavate latrine nearby water scheme - Avoid surface water collection by constructing drainage - Collect dirty materials in one place - Washing the reservoir wire 3. Auditing, Reporting and Calculation of water tariff In details: - Auditing: How and when to control income and expense, who control cash /income and expense - Reporting: Clarification about cash control, importance of clarification and accomplishment, for whom and when clarification is given - The calculation of water tariff is based on jerry can: the price is 0,01 birr per litre; for example a 10 litres jerry can price is 0,10 birr, while a 25 litres jerry can is 0,25 birr. **Name of water committee members attending the training** Anbese Terkesa - Cashier, Arekebo Adebo – Guard /technician/, Melo Desalegn - Guard /technician/ Areso Adebo – Guard /technician/, Tarkegn Tambabo – leader. Tesema Ferhiwot – Secretary, Adelo Shemelo – Guard /technician/, berash Wentgo – member

LVIA has been working in WASH in different parts of Ethiopia. And have several success stories behind their belt, including the windmills for water lifting (up to max 90 m) in the Meki-Ziway areas of the Oromo region. The NGO pilots and replicates alternative energy technologies and is an active member of the Energy Forum. In Sidama Zone Bensa Woreda, micro-hydropower facilities are under construction in two villages. Their commitment to and high competence in participatory approaches significantly improves the likelihood of sustainability. Their approach is area/watershed oriented and detailed multi-sector studies and investigations conducted prior to planning possible programs and interventions. LVIA expressed strong interest in cooperating with the CDA/proposed project.

Text box 5.5 Example of a sustainable water supply system from Plan International

Implementer:	Plan International
Location:	Shebedino Woreda; Community Water Supply, Sanitation and Hygiene (Borehole Source with distribution system); SNNPRS region/ Gonowa Gabalo village
Year of construction:	In 2005 - 2007 (including borehole construction, design and implementation of the water, sanitation and hygiene promotion activities)
Month and year of completion:	2007
Date of last visit by member of your organization:	2011
Findings on changed and developments during this last visit:	The WASH Committee is responsible for running the operation and management of the scheme with-out any other external support in day to day activities. Support is needed only when things are beyond their capacity. For such cases the committee knows where to seek support by covering the coasts from other service providers. The operation and maintenance costs are also covered by the communities (water fee).

Ownership:	Who was the owner after completion, who is the owner now? The Beneficiary community.
Type of technology:	Borehole with submersible and diesel generator and distribution system.
Type of energy:	Diesel generator
Estimated number of beneficiaries:	451 HH (2255 people)
What were access factors for its' sustainability:	Choice of the technology option: we undertook socio-economic survey including water resource assessment in 2004. The assessment revealed that the only option is ground water. We facilitated discussion with the community, and they also confirmed that the feasible source is ground water/borehole. Discussion also made with them on the requirement of borehole (such as a relative high operation and maintenance costs – fuel and spare parts, higher tariff rate etc). The community made reference to a similar motorized /borehole/ schemes in their neighbourhood. They also made clear that they are ready to handle the operation, maintenance and management of the scheme by covering fuel, spare part, and care takers costs. During the construction stage, care takers nominated by the community were trained on pump and generator operation, servicing and maintenance. For major breakdowns and maintenance the woreda/district and the zonal Water and Mine Offices are providing support. Proper community organization and mobilization to ensure demand based project implementation: the community was properly organized (WaSHCom established – 3 women out of 7 total members), who were responsible to mobilize the community from the stage of project idea initiation to construction and management of the completed project. The WaSHCom has closely worked with the construction and H&S promotion team starting from the beginning until the end of the implementation. There was about 10% (in cash, labour, local material contribution) for the construction of project made by the community. At the completion of the project, the committee also deposited about Birr 10,000 as an initial /start-up capital for the ORM cost. Sufficient capacity building to the WASH Committees: We have made continuous capacity building that will enable them to manage their schemes within their skill and knowledge, with no or very few support from external bodies. The 7 WaSHCom were trained for 5 days on project management, tariff setting, financial management and inspection of the overall functionality of the system. Moreover, care takers were nominated and trained for 15 days in plumbing, tariff collection and handling, carrying out operation and maintenance and promotion of H&S. Establish linkage with Woreda Water Office and Kebele Administration system: We have learnt from our different experiences that some WASH Committee members don't fulfil their responsibility, though all the necessary trainings are given to them. They lack commitment to what they have accepted responsibility on behalf of the community. In most cases, when a trained WASH Committee doesn't exercise its role and responsibility, the community will simply replace with other member selected from the community. But, there should be some sort of agreement from the very beginning that punishment be in place when any one of the committee member is not doing what is expected from him/her. For this reason, we have given training and orientation on such issues to the Kebele Administration people so that they will be able to follow up and coach committees who are not properly rendering roles and responsibility. Because time and money has been wasted to train them. For major technical supports, that goes beyond the capacity of village based scheme-care-takers, the Woreda Water bureau need to assist them. Hence, this has also been properly linked. There is re-election of WaSHCom members every 2 years. Those who are not giving the proper service are replaced by new ones. The activity is taken care of by the Kebele admin and the Woreda Water and Energy office.

Text box 5.6 Example of a sustainable water supply system from Plan International

Implementer:	Plan International
Location:	Shebedino Woreda Harbe Shisho Community Water Supply, Sanitation and Hygiene (Spring Source with motorised and distribution system); Harbe Shisho kebele
Year of construction:	In 2005 - 2006 (design and implementation of the water, sanitation and hygiene promotion activities)
Month and year of completion:	2006
Date of last visit by member of your organization:	2011
Findings on changed and developments during this last visit:	The WASH Committee which is responsible for running the operation and management of the scheme is running the scheme with-out any other external support. The operation and maintenance costs are also covered by the communities (water fee).
Ownership:	Who was the owner after completion, who is the owner now? The Beneficiary community
Type of technology:	Spring source, with busting pump powered with diesel generator to lift the water to a storage reservoir and

	distribution system.
Type of energy:	Diesel generator
Estimated number of beneficiaries:	840 HH (4200 people)
What were access factors for its' sustainability:	Choice of the technology option: Plan commissioned the service to Metaferia Consulting Engineers and undertaken water resource assessment and socio-economic survey in 2004. The assessment revealed that the options (for such large number of people) are ground water (borehole) or spring. We facilitated community discussion on the alternatives and consensus was reached to take spring as the sources of the scheme. It was also understood and verified that the spring (which is located in the valley – lower position) could not flow by gravity to the communities who are settled on the ridge (higher elevation), unless it is fitted with boosting mechanism to a reservoir. The discussion also made to create awareness on the type of the scheme which requires them with a relative high operation and maintenance costs (fuel and spare parts, higher tariff rate etc). During the discussion the communities expressed their readiness to handle the operation, maintenance and management of the scheme by covering fuel, spare part, and care takers costs. During the construction stage, care takes nominated by the community were trained including on pump and generator operation, servicing and maintenance. For major breakdown and maintenance the woreda and the zonal water and mine offices are providing support. The quality of the construction, and electromechanical equipment selection and installation has also contributed for the sustainability of the scheme. Proper community organization and mobilization to ensure demand based project implementation: the community were properly organized (WaSHCom established – 3 women out of 7 total members), who was responsible to mobilize the community from the stage of project idea initiation to construction and management of the completed project. The WaSHCom has closely worked with the construction and H&S promotion team starting from the beginning until the end of the implementation. There was about 10% (in cash, labour, local material contribution) for the construction of project made by the community. At the completion of the project, the committees also deposited about Birr 10,000 as an initial /start-up capital for the ORM cost. Sufficient capacity building to the WASH Committees: We have made continuous capacity building that will enable them to manage their schemes within their skill and knowledge, with no or very few support from external bodies. The 7 WaSHCom were trained for 5 days on project management, tariff setting, financial management and inspection of the overall functionality of the system. Moreover, care takers were nominated and trained for 15 days in plumbing, tariff collection and handling, carrying out operation and maintenance and promotion of H&S. Establish linkage with Woreda Water Office and Kebele Administration system: We have learnt from our different experiences that some WASH Committees don't fulfil their full responsibility, though all the necessary trainings were given to them. They lack commitment to what they have taken responsibility on behalf of the community. In most cases, when a trained WASH Committee doesn't exercise its role and responsibility, the community will simply replace with other member selected from the community. But, there should be some sort of agreement from the very beginning that punishment be in place when any one of the committee member is not doing what is expected from him/her. For this reason, we have given training and orientation on such issues to the Kebele Administration people so that they will be able to follow up and coach committees who are not properly doing their roles and responsibilities since time and money has been wasted to train them. For major technical supports, that goes beyond the capacity of village based scheme-care-takers, the Wereda Water Office assist them by covering the costs involved. Hence, this has also been properly linked and is known by all actors. There is re-election of Wash COM members every 2 years. Those who are not giving the proper service are replaced by new ones. The activity is taken care of by the Kebele admin and the Wereda Water and Energy office.

Plan International has considerable experience with WASH and all aspects of community development. The NGO works in Sidama in Shebedino and Gorcha Woredas plans to expand to other Woredas in Sidama. Technologies include springs with motorized gravity systems, deep wells with engine driven pumps. Plan international has piloted solar energy for water lifting and is currently constructing a solar energy driven pumps for a spring distribution system in a rural area of Shebedino and is a member of the solar energy network in SNNPR. Plan International would be a good partner for the proposed solar energy powered WSSs proposed for the Loka Abaya administrative centre.

6 CONCLUSIONS

6.1 Recommendations for upcoming DCCZ in water and sanitation in SNNPR

6.1.1 Focus

It is recommended to narrow the scope to 2 Woredas. Additional Woredas can be added subject to availability of funds and capacities at a later stage. Section 5.1 provides rationale for narrowing the scope and for selecting Loka Abaya and Aleta Chuko as proposed priority Woredas. Both Woredas have relatively low coverage, particularly in the lowlands and are neighboring each other. Focusing activities on a limited geographical area - mainly the lowlands of Loka Abaya Aleta Chuko where reportedly no other donors work or plan activities in the near future, combined with effective utilization of resources due to reasonable distances between individual sites, will create a potential for delineation and visible impact of the proposed project.

It is recommended not to replace the proposed (and agreed with local authorities) priority Woredas; the project could end up with two different Woredas at different locations of the Zone; field assessment would need to be repeated in the new Woreda requiring additional resources and time.

It is recommended to update and to verify activities implemented or planned by other donors and NGOs during the project formulation as well as during the preparatory phase to avoid overlaps and duplications. If potential duplications become known after the project commencement, efforts should be made to seek complementarities. This can be in the form of geographical division, focus on different engineering solutions, as well as (depending on the competence areas of the NGO) by dividing the type of interventions with the NGO focusing on community development, sanitation and hygiene promotion (possibly with related infrastructure) and the project on hardware and high cost technologies – where the strengths lie. This would still allow, in a modified way, to maintain a clearly defined "niche".

Focus should remain mainly on the lowlands of the two neighboring proposed priority Woredas and on high technology engineering solutions where the Czech Republic with its extensive traditional experience in hydro-geology has a comparative advantage. Technical works (drilling) can, under close and competent supervision, be well managed by Ethiopian companies. What sets a Czech, specialized and experienced company apart is the deep knowledge and understanding of geology/hydrogeology related interdependencies and causalities, ruling principles of water circulation, solutions for relatively large and complex territorial areas ("regional hydrogeology") – all that can be summarized under the "concept of holistic approach to solutions", as opposed to a one-off "commissioning a drilling job" as has been as the practice by several NGOs.[52] Comparing the cost of proper surveys with the increasing cost of drilling, "commissioning a drilling job" is not a viable solution. Hydrogeology in Ethiopia is relatively young. The level of competence achieved through education, long-term tradition and experience and transfers of know-how cannot be reached in a relatively short-term.

6.1.2 Possible synergies

For the hardware component, synergies are perceived mainly in exchange of know-how and capacity building. This is different for the software component. Although a wealth of knowledge and experience exists in Ethiopia, there are few competent hands-on capacity builders and implementers; these are typically NGOs.

This is particularly true for the sanitation and hygiene promotion. Commitment to integrating sanitation and hygiene promotion is relatively new; until some 10 years ago, these activities were limited safe water chain and sanitation around the WSSs. Nevertheless, this component should be an integral part of the proposed project if desired impact is to be achieved.

Optional implementation modalities are outlined in section 6.2 below. It is recommended, during the project formulation, to assess the potential, capacities and competence of potential partners identified in section 5.4 and to explore different cooperation modalities. It is for example possible to sub-contract one NGO (such as SNV, PIN, LVIA or WaterAid) for capacity building and supervision and a locally active NGO for implementation. It could also be considered to leave the implementation with local (community and kebele level) specialists and volunteers and outsource the KAP survey, capacity building and M&E.

[52] An example are two drills commissioned by PIN in Alaba where one is a failure

Community development activities can be outsourced or implemented by the project. Both options have their pros and cons discussed in section 6.2 below. If the project retains the ownership of and full control over this component, the "visibility" will certainly improve, in particular because this component has an immediate link to the hardware component. From this view point, retaining the component within the project may be the better option.

Options for possible co-funding of activities (in addition to community contribution to the construction cost) need to be investigated before and during the project formulation at bilateral level. These include the possibility of RiPPLE funding action research supply chain study for the two Woredas. It may also be possible to reach an agreement on outsourcing the health and sanitation promotion component as a whole, including funding.

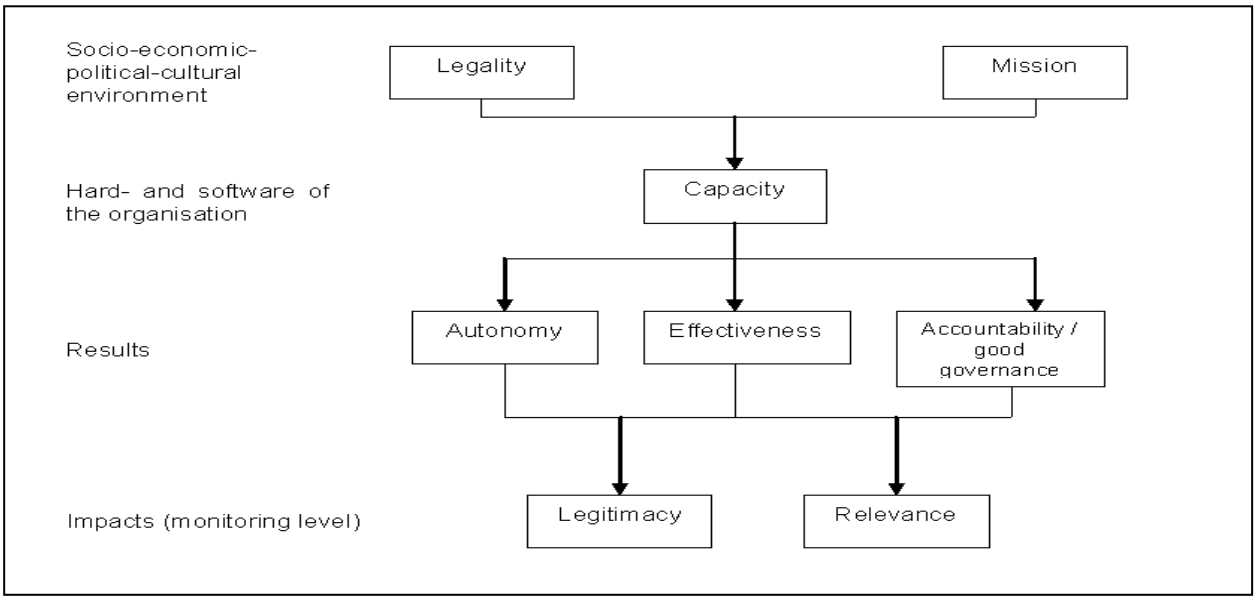
6.1.3 Sustainable management, operation and maintenance

"The road to rural drinking water supply projects is often lined with broken pumps and frequented by women and children tracking water from distant or polluted sources"[53]. The road to the proposed project should be different; the project should aim to achieve a visible and lasting effect.

Good quality construction at correctly selected sites, strong ownership and good governance of management by the community, cooperation with and support of local partners, strong perceived need and willingness to pay cost-recovery tariff, arrangements for spare parts and access to technical know-how are prerequisites for sustainability and lasting effect. If one of the elements of the chain is faulty, it is likely that the desired effect will not be achieved. Focus on community development and sustainability support activities is a key pre-requisite. Close monitoring of the likelihood of sustainability and feed back with MIS is recommended.

International practice and experience has shown that there are eight determinants for the sustainability of organizations. These were developed from experience of several projects and related specifically to water management organizations. For water supply and sanitation schemes as for many other schemes, the impact monitoring level is the most important one. The figure below illustrates how these eight determinants relate to each other. As can be seen from the figure, a high degree of legitimacy and relevance as defined above can ensure a strong sustainability.

Figure 6.1: Monitoring of sustainable O&M



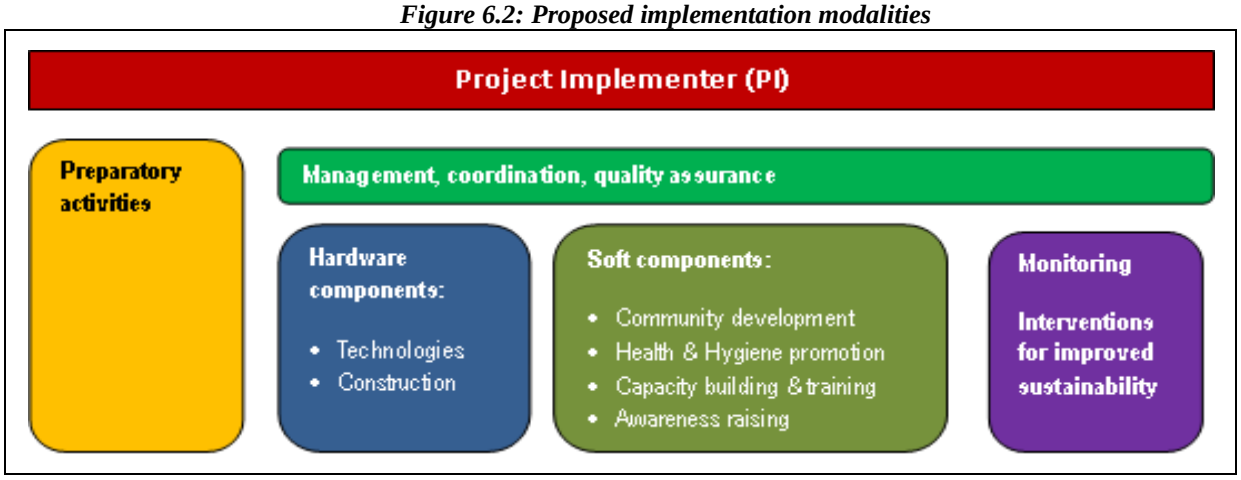
53 Körner, Marie. June 2011. Participatory Monitoring for Improved Sustainability. Evaluation Connections, EES Newsletter

6.2 Proposed implementation modalities

6.2.1 Appointing Project Implementer

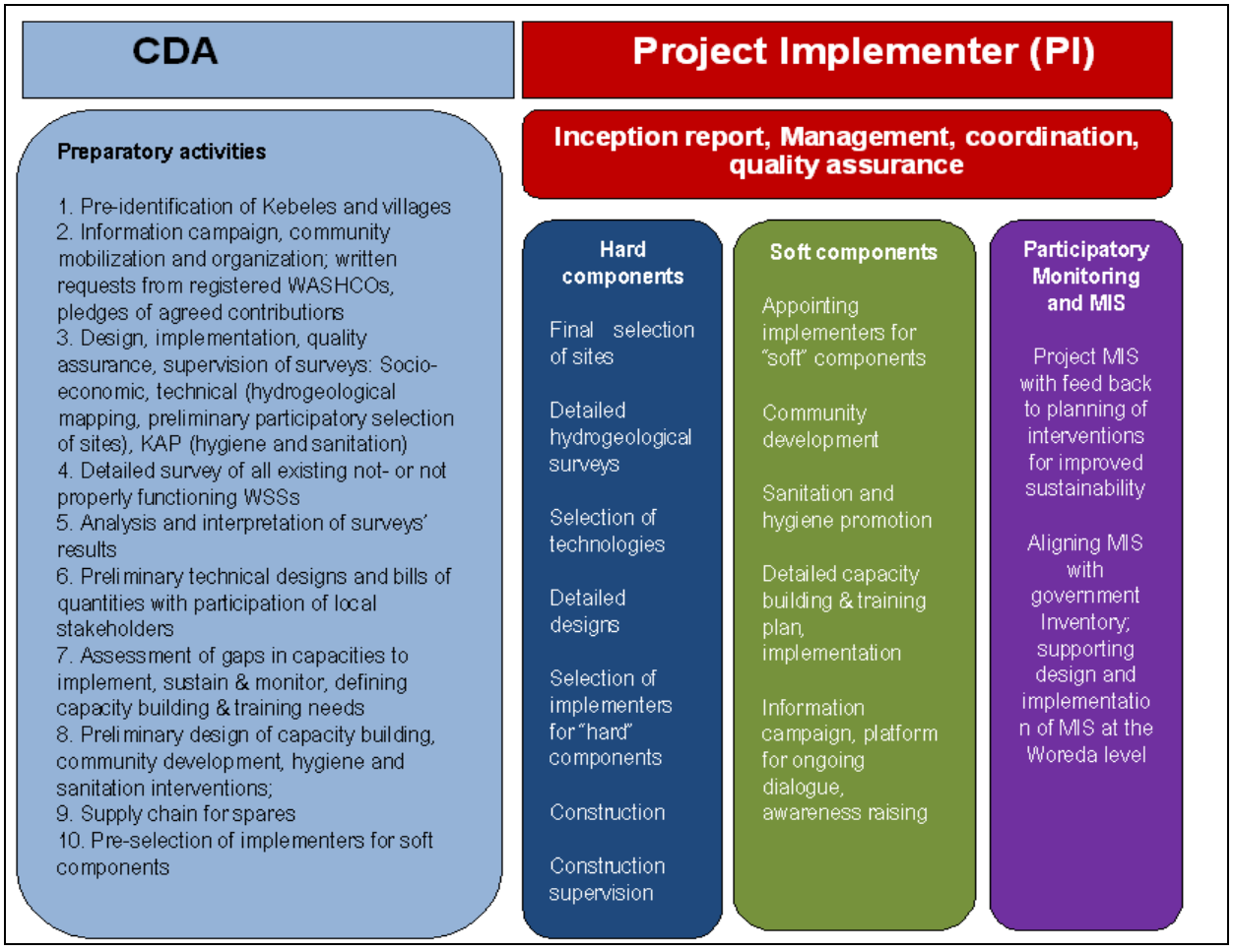
Assessment confirmed that one of the most critical assumptions for successful project implementation and enhanced sustainability is the ability and capability to effectively integrate technical and soft components in a continued manner and to plan/adjust intervention of the basis of information from the participatory monitoring mechanism. It is recommended to appoint a Project Implementer (PI) – one contractor to be located in the project area for the whole project duration. The proposed implementation modalities under this scenario are depicted in Figure 6.2 below.

Figure 6.2: Proposed implementation modalities



In a presentation/briefing meeting with the CDA on 17 August 2011, the consultant was advised that preparatory activities will be implemented by the CDA. The revised implementation structure is depicted in Figure 6.3 below.

Figure 6.3: Revised implementation modalities



6.2.2 Channelling funds and procurement

Channelling of funds
The issue of implementation arrangements has been raised during the debriefing meeting with the SNNPR WASH representatives on 23 June. (Signed summary attached in Annex L). The BOFED representative outlined the currently available options:

i. The preferred option is for the donor to channel funds through the Government (Ministry of Finance) to the sector Bureau (RBWM&E)
ii. Donor can channel funds to a company[54]
iii. Funds are channelled to an accredited NGO (the rule for 25% overheads prevails)

The mission recommends option ii: The CDA selects, through a proper procedure, a company – Project Implementer (PI). Funds for project implementation will be channelled through the PI.

Rationale behind the recommendation
Funds channelled through the Ministry of Finance flow to the RBWM&E and to the WASH implementing agencies, Woredas. (An option piloted by Finida in the Amhara Region but not yet introduced in SNNPR is channelling funds directly to the communitiesthrough intermediary micro-finance institutions.) The donor remains anonymous and the regional and local authorities use the funds for priority WASH activities. In the case of the proposed project, an agreement could probably be made that the CDA funds are directed to Loka Abaya and Aleta Chuko. The donor has no direct control over the financial management and monitoring or over the implementation process. This option may be the right way forward, also for a relatively small donor, once the comprehensive WASH mechanism including MIS is in place, staff appointed and fielded and capacities adequately developed, as foreseen in the draft WIF. This process may take several years. Under the current scenario with limited human resources and technical capacities, the risks to effectiveness, efficiency of implementation and sustainability after completion are considered too high, in particular for the proposed engineering solutions that are demanding on technical know how and high-tech equipment and that have so far been implemented to only a limited extent precisely because the required capacities are not yet available.

Channelling funds through an accredited NGO is not considered appropriate for the same reasons; there are no NGOs operating in the proposed Woredas that would currently have the capacity to implement the proposed engineering solutions.

Procurement and secondments
According to BOFED, for procurement of goods, services and works either GOE of donor procedures apply. Surveys (such as hydrogeological, geophysical and engineering survey) can be outsourced in an open bid with both the government and the private sector participating. Secondment of Government staff is possible, usually against per diem and top-up payment

6.2.3 Splitting Woredas or project components

The option of splitting implementation in two separate projects – one for Aleta Chuko, one for Loka Abaya- has been discussed extensively. The relevant government authorities (Zone, Region, and Ministry) support implementing both Woredas as one project. In view of the consultant, there really is no advantage in splitting the project along administrative borders; treating it as a one project would streamline and simplify implementation and the MOU, in particular since the proposed priority Woredas are neighbouring each other, with adjacent kola areas. It will also allow for more effective and cost efficient organization and implementation of the preparatory activities including technical, social and KAP surveys

It is recommended to cover both Woredas under one and the same project of 5 years duration.

6.2.4 Options for implementation arrangements

If the proposed option for channelling funds is accepted, the project will include the following components[55]:

[54] Donor managed projects are not foreseen in the draft WIF. The MOU for the proposed project will need to be clear on the financing and implementation modalities.

[55] Section 5.5 provides details for geological, hydrogeological and geophysical study and mapping of proposed sites; design and project documentation and construction works; Section 5.6 provides details for community development and for sanitation and hygiene promotion.

A. Project management and coordination
B. Geological, hydrogeological and geophysical study and mapping of proposed sites (estimated duration 2-3 months)
C. Design and project documentation (estimated duration 2 to 3 months)
D. Construction works
E. Supervision
F. Community development
G. Sanitation and hygiene promotion

Options for implementation modalities are presented below.

Table 6.1: Options for implementation modalities

Component	Options for implementation modalities	Advantages and disadvantages of options
A. Project management and coordination	Selection of PI by the CDA	The only identified option provided recommendation to channel funds through a company is accepted
B. Geological, hydrogeological and geophysical study and mapping of proposed sites	1. Selection by the PI of suitable Ethiopian and/or international sub-contractor, QA by PI	• Offers the possibility to select qualified subcontractor with relevant experience and knowledge; flexibility to replace in case of underperformance; quality of survey assured by PI. • Requires selection procedures that take time. This can be mitigated by asking tenderers to include the sub-contractor in the offer
	2. Implementation by PI, possibly with involvement of local partners to benefit from local knowledge, capacity building, sharing know-how	• Offers the possibility to avoid time required for sub-contracting; • Requires larger team; no QA; identification of individual qualified candidates with knowledge of the project areas may be difficult
C. Design and project documentation	• Implementation by PI, possibly with involvement of the communities and local partners – capacity building, sharing know-how, feedback on design priorities	• Offers developing a good understanding and "institutional" memory within the PI team , continuity - particularly useful if combined with supervision; feed back with the PI Head Office; qualification, knowledge of international standards and good practice can be included in the TOR and evaluated in the selection process • Requires larger team
	• Implementation by Ethiopian sub-contractor selected by PI	• Possible knowledge of project area and local practices (standards are under preparation) • Selection process can be only after study, requires time, delays preparatory activities; no vested interest in capacity building and involving local partners; requires input from PI in form of supervision and QA – possible corrections
D. Construction works	1. Implemented by Ethiopian sub-contractor selected by the PI; involving communities can be part of the sub-contract	• Knowledge of local environment; lower cost; can easier communicate with a build capacity of local partners; flexibility in replacing staff on short-term notice; quick mobilization and demobilization; technology (drilling rigs, tools and materials) is available; supervision by PI • No disadvantages have been identified
	2. Implemented by PI	• No advantages have been identified • Requires additional staff; possible difficulties with hiring local labor; procurement or hire of equipment
E. Supervision	1. Implemented by PI possibly with involvement of communities and local partners – capacity building, sharing know how	• Easier if own designs; likelihood of Impartiality; control of contract management including variation orders and payment requests/releases remains within the PI who is responsible for the construction and has vested interest in quality • No disadvantages have been identified
	2. Implemented by sub-contractor selected by PI	• No advantages have been identified • PI would need to supervise the supervisor to ensure quality because of its responsibility for the results
F. Community development	1. Subcontracted to an experienced reputable and good NGO established in SNNPR who would work closely with and build capacities of local government staff, the private sector and communities. Supervision implementation support and QA by PI	• There are several NGOs operating in the areas with proven (to the consultant) competence and capacity; some NGOs have developed methodologies, procedures, materials, are familiar with sustainability problems and how to address them • Option not preferred by but acceptable to the MOW&E
	2. Implemented by the RBWM&E; project would provide funding	• Option preferred by the MOW&E; additional competences and capacities can be provided by the project in the form of seconding qualified staff to work alongside the regional experts which would build the capacity of the region. • The PI would need to hire additional staff for seconding; qualified and experienced staff may be already working with organizations; free lance individuals do not have backstopping by organizations; local government would need to create and to fill additional positions; achieving desired results

		may not be possible during project life span
	3. Implemented by PI	• Direct control over activities and quality, methods and quality, bring in new experiences and know how • Possible duplication of competence with a local service provider
G. Sanitation and hygiene promotion	1. Subcontracted to an experienced reputable and good NGO established in SNNPR who would work closely with and build capacities of local government staff, the private sector and communities. Supervision implementation support and QA by PI	• There are few NGOs operating in the areas with required competence and capacity; some NGOs have developed methodologies, procedures, materials, are familiar with problems and how to address them • Option not preferred by but acceptable to the MOW&E
	4. Implemented by the RBWM&E; project would provide funding	• Option preferred by the MOW&E; additional competences and capacities can be provided by the project in the form of seconding qualified staff to work alongside the regional experts which would build the capacity of the region. • The PI would need to hire additional staff for seconding; qualified and experienced staff may be already working with organizations; free lance individuals do not have backstopping by organizations; local government would need to create and to fill additional positions; achieving desired results may not be possible during project life span
	5. Implemented by PI	• Control over activities, methods and quality. • Duplication of what already exists and can be drawn upon

The consultant recommends the following implementation modalities:

- Project management and coordination to be contracted to a company – PI, with an office in Hawassa and/or in Yirga Alem.
- PI will select, appoint and QA suitable Ethiopian and/or international sub-contractor to implement geological, hydrogeological and geophysical study and mapping of proposed sites, review optional sources of energy supply. The sub-contractor will be obliged to liaise with relevant experts from the SZDWM&E and the RBWM&E.
- PI will prepare design and project documentation and supervise the works, with involvement and participation of the communities, the Woredas as well as the Zone, the Region, private sector and NGOs as/if appropriate.
- PI will select, appoint and supervise Ethiopian sub-contractor to implement the construction works; the sub-contractor will be obliged to train (on-the-job) WASHCOs' care takers/technicians who will work alongside with the sub-contractor; The PI will liaise with the communities and Woredas, possibly also Zone and Region as well as the private sector (including technical training institutions) for capacity building in technical aspects of O&M during and after construction.
- Community development activities can be implemented in two ways:
    - An experienced reputable and good NGO established in SNNPR will be identified and sub-contracted for community development activities. The NGO will work closely with and build capacities of local government staff, the private sector and communities. Supervision, implementation support, methodological guidance and QA by PI. Additional competences and capacities can be provided by the project in the form of seconding qualified staff to work alongside the regional experts; this would build the capacity of the region. During the project duration, additional positions could be created and staff appointed according to the needs. Implementation by the PI is a viable option.
    - The PI will engage qualified and experienced staff to implement community development activities in close cooperation with local partners. The socio-economic needs assessment can be sub-contracted to an NGO.
- An experienced reputable and good NGO established in SNNPR will be identified and sub-contracted for sanitation and hygiene promotion. The NGO will work closely with and build capacities of local government staff, the private sector and communities. Supervision, implementation support, methodological guidance and QA by PI. Additional competences and capacities can be provided by the project in the form of seconding qualified staff to work alongside the regional experts to build their capacity and the capacity of the region. During the project duration, additional positions could be created and staff appointed according to the needs.

6.2.5 Phasing

Dividing the project in two separate phases according to its stages

- Phase 1 would include preparatory stage - activities including geological, hydrogeological and geophysical study and mapping of proposed sites, review optional sources of energy supply, needs assessment and KAP studies

- Phase 2 would include implementation stage:
  1. Preparing design and project documentation, construction, supervision, technical training and capacity building
  2. Community development activities designed on the basis of needs assessment for improved ownership and sustainability (facilitating inclusive participation, transparency, accountability, good governance and empowerment). Participatory M&E mechanism and dynamic MIS.
  3. Activities designed on the basis of KAP study for sanitation and hygiene promotion and education: IEC (Information, Education and Communication) interventions, setting realistic and measurable targets in the areas of the three WASH thematic groups: (i) Safe excreta disposal, (ii) hand washing/personal hygiene and (iii) safe management and treatment of water (water source monitoring, fencing, proper drain off, sanitation zone).

Table 6.2: Advantages and disadvantages of phasing according to project stages

Advantages	Disadvantages
Results from preparatory activities could be available after about a year and taken into consideration when formulating the project document for the implementation phase	Lack of continuity and institutional memory; different sub-contractors may be appointed for phases 1 and 2 respectively. No opportunity for feedback and dialogue between the implementing PI and the sub-contractors for the technical-, demand- and KAP studies. The issue of rolling out, coordination, supervision and QA would need resolving More time likely to be needed for realization of the project – due to the gap between phases and establishing PI.

In view of the consultant, the disadvantages outweigh the advantages; *it is recommended to implement both the preparatory and the implementation stage as phases of the same project.*

Phasing implementation by Woredas

The project could start in Loka Abaya. After establishing the PI office in the project area and rolling out, completion and analysis of preparatory studies and surveys (about 1 year), implementation could start in Loka Abaya and preparatory activities in Aleta Chuko. Since the PI office would already be established and possibly the same sub-contractors used, preparatory activities in Aleta Chuko should not take more than 6 months.

This option has been presented during the debriefings. While the SZDWM&E had no objections to this proposed approach, the Regional WASH authorities preferred the option of starting in both Woredas simultaneously to speed up implementation (and possibly to also show activities on the ground).

Table 6.3: Advantages and disadvantages of phasing implementation by Woredas

Advantages	Disadvantages
The work would be less during the first year giving more time for establishing the PI Office	Opposition from the Regional WASH authorities
The proposed project could learn from lessons in Loka Abaya and avoid inefficiencies in Aleta Chuko	Possible delay in completion (maximum 6 months)

The consultant is of the view that the advantages outweigh the disadvantages; *approach phased by Woredas is recommended.*

6.3 Other suggestions

CDA should closely monitor and supervise the project implementation and activities (supervision visits by a technical expert) throughout, but in particular at the early stages, when decision are taken about selection of sites.
The project should follow the integrated WASH approach for improved impact and sustainability.
Speeding up project formulation and signing of MOU before the GOE may express strong priority on channeling funds through the common fund.