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

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The Sustainability of Water Supply Schemes

A case study in Alaba Special *woreda*

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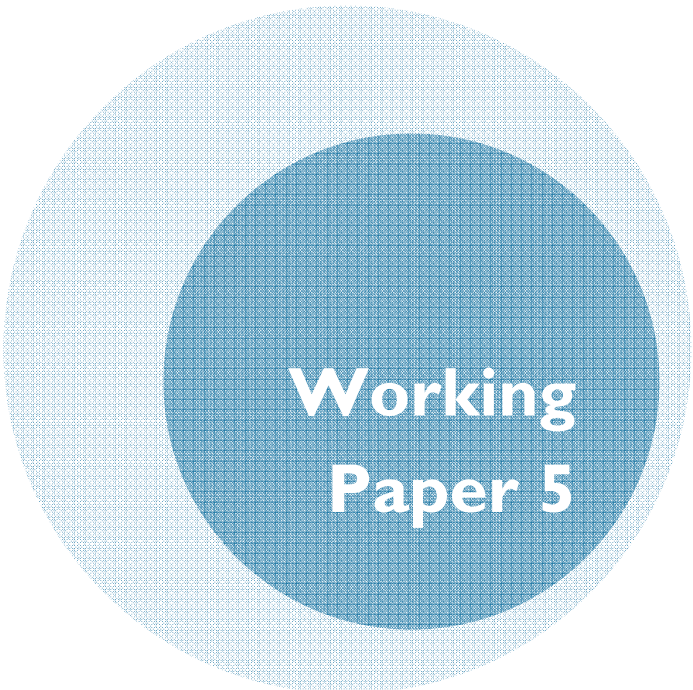

Research-inspired Policy and Practice Learning in Ethiopia and the Nile region (RiPPLE) is a five-year research programme consortium funded by the UK's Department for International Development (DFID). It aims to advance evidence-based learning on water supply and sanitation (WSS) focusing specifically on issues of planning, financing, delivery and sustainability and the links between sector improvements and pro-poor economic growth.

RIPPLE Working Papers contain research questions, methods, preliminary analysis and discussion of research results (from case studies or desk research). They are intended to stimulate debate on policy implications of research findings as well as feed into Long-term Action Research.

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Contents

List of tables and figures

List of Acronyms

ADA	Alaba Development Association
ADB	Asian Development Bank
BoFED	Bureau of Finance and Economic Development
BoWR	Bureau of Water Resources
DBH	Deep Borehole
CBO	Community-based Organisation
DFID	UK Department for International Development
EC	Ethiopian Calendar
ESRDF	Ethiopian Social Rehabilitation and Development Fund
FGD	Focus Group Discussion
FN	Functional
GaP	Governance and Planning
GPS	Global Position System
IDR-AAU	Institute for Development Research Addis Ababa University
IRC	International Water and Sanitation Centre
KAP	Knowledge, Attitude and Practice
LAR	Long-term Action Research
LPA	Learning and Practice Alliance
MDG	Millennium Development Goal
MoU	Memorandum of Understanding
MoWR	Ministry of Water Resources
NF	Non-functional
NGO	Non-governmental Organisation
NRW	Non-revenue Water
O&M	Operation and Maintenance
ODI	Overseas Development Institute
PINF	People in Need Foundation
PSAASCR	Prince Sultan Abdul-Aziz Social Committee for Relief
QIS	Qualitative Information System
RiPPLE	Research-inspired Policy and Practice Learning in Ethiopia and the Nile Region
R-WaSH	Rural Water Supply, Sanitation and Hygiene

SNNPR	Southern Nations and Nationalities Peoples Region
SPSS	Statistical Package for Social Science
UAP	Universal Access Plan
UfW	Unaccounted-for Water
UK	United Kingdom
UN	United Nations
UNICEF	UN Children's Fund
UNDP	UN Development Programme
USAID	US Agency for International Development
VHC	Volunteer Health Communicator
VLOM	Village-level Operation and Maintenance
WaSH	Water, Sanitation and Hygiene
WATSANCo	Water and Sanitation Committee
WHO	World Health Organisation
WWRDO	Woreda Water Resources Development Office

Executive summary

Both the government of Ethiopia and donors are striving to increase the water supply coverage of the country. However, a high rate of non-functionality of the water supply schemes developed has been observed both at the national and regional levels, implying a negative impact on the country's water supply and sanitation coverage. If the underlining causes of this higher non-functionality rate are known, the problem can be minimised by undertaking the appropriate interventions in the sector in the Woreda.

This study therefore aims to investigate the functionality and service levels of existing water supply schemes; examine the institutional, technological, environmental and financial factors impacting sustainability of schemes; examine links between participatory planning, social accountability, governance and scheme sustainability; and identify issues for best practice guidelines for development practitioners to bring about improved sustainability.

A mix of both qualitative and quantitative data collection instruments was used to achieve these objectives. Data collection activities were divided into community (scheme) level and Woreda level. At community level, the following took place in eight selected schemes to acquire in-depth information: focus group discussions (FGDs) of water committees and ordinary community members for each user community; water committee resource mapping; key informant interviews; a knowledge, attitudes and practices (KAP) survey of elderly people; and interviews with kebele chairpersons. In addition, water source and point mappings were done of all the 24 schemes and 65 water points found in the Woreda.

At Woreda level, the following activities took place: institutional resource mapping; institutional and stakeholder mapping/analysis; and interviews and KAP surveys at the WWRDO, the Health Office, the Woreda Administration and Water Action. In addition, an FGD at the WWRDO was also conducted. A document review was carried out as well as physical observation of all the water points and sources and all visited WATSANCos and organisations working in the sector.

Findings show that the Woreda is entirely served by deep boreholes (24) with distribution networks to water points (65). Only 24 kebeles, out of the 76 rural kebeles, were found to have improved water sources. In the Woreda, there is a high rate of scheme and water point failure, with approximately 42% and 62% of schemes and water points being non-functional, respectively. When scheme breakdowns occur, the speed of maintenance is slow. Maintenance on minor breakdowns is performed within two weeks, whereas major breakdowns take a minimum of three months to fix, at an average of 12 months. The bacteriological quality of the water from the source is good; however, there is a serious fluoride problem in the Woreda.

Per capita water use was found to be 10 litres. This is in part because distance to water points is typically greater than the UAP norm of 1.5km. In the Woreda, the average roundtrip, including waiting, is nine hours and five hours in the dry and wet seasons, respectively. Women and girls support this burden entirely. The reasons for poor service levels and sustainability are a mix of: lack of technical and managerial capacity (in all actors: government, communities and private sector); lack of spare parts and financing; insufficient cost recovery and management of funds from cost recovery; lack of clarity of roles and responsibilities; poor coordination and communication; poor (non-existent) information management; and inappropriate technology choice.

In general, the findings show that the situation regarding sustainability and service levels in Alaba is critical. Most Woreda communities have no access to improved water sources. As a result, there is high pressure on the functioning water supply schemes. In addition, the reliability of the sources is questionable owing to recurrent failure and slow speed of maintenance. Generally, sources do not provide enough water to meet UAP norms.

The reasons for this are multifaceted, as noted above, and it is difficult to pick out one as being more important than the others: it is the combination of factors that causes the problem. However, poor management throughout the service delivery chain is a very important element in poor sustainability and service delivery.

In order to increase service levels and ensure scheme sustainability in the future, the following recommendations are made to stakeholders and other relevant actors:

- Rehabilitation and maintenance of non-functional schemes; replacement of schemes that are beyond their design period and are not currently providing a service; construction of new schemes in areas where there is high demand for improved water and increasing the number of water points in schemes where there is high water demand but limited numbers of water points; and construction of water points at a reasonable distance to serve the majority of the users.
- Implementation of integrated watershed management activities to conserve and enhance the groundwater resource and creation of awareness in the community on the nature of the groundwater resource and the importance of source conservation, enhancement and protection.
- Introduction of affordable and simple fluoride treatment plants at scheme level and disinfection of the water in reservoirs before it reaches users.
- Involvement of the community throughout project development phases to create a sense of ownership.
- Legalisation of the WATSANCos to solve prevailing management problems, including those surrounding accountability, transparency, reporting, auditing etc.
- Strict follow-up and supervision during the design and implementation of newly constructed schemes to avoid leading to recurrent scheme failure.
- Capacitating of the WATSANCos through the provision of trainings and maintenance kits.
- Regular follow-up and supervision of the WATSANCos and schemes to prevent mismanagement and to check on scheme status.
- Capacity building of the WWRDO, through the provision of logistics, maintenance kits, sufficient budget and human resources, and assignation of an office head who is fully engaged and performs only this job.
- Capacitating of the rural water supply maintenance team of BoWR, through the provision of logistics and human resources, in order to be able to provide an immediate response to major scheme breakdowns.
- Promotion of the private sector to open a spare parts shop in Alaba town to solve problems related to cost and scarcity of spare parts.

- Standardisation of technology (pumps, generators, etc) used in the Woreda, depending on the reality on the ground, and provision of trainings and spare parts accordingly.
- Creation of coordination and means of communication among stakeholders in order to avoid duplication of effort and to fill in the gaps in the sector
- Establishment of scheme handover and design standards, depending on the reality of the Woreda.
- Establishment of a good information management system, both at the community level (WATSANCos) and at the Woreda level (WWRDO and NGOs).

1 Introduction

The sustainability of community-managed rural water supply schemes is a key factor in meeting the Millennium Development Goals (MDGs), in terms of ensuring environmental sustainability, improving health and eradicating extreme poverty for the overwhelming rural majority living in the developing world.

In the majority of cases, it is rural poor communities that are socially and economically affected by water inadequacy and subsequent poverty. The quality of potable water and the threat of waterborne diseases, such as cholera and typhoid, are critical public health issues in many developing countries (ADB, 2002). Moreover, worldwide, poor sanitation practices and a lack of safe and clean water for drinking, cooking and washing are responsible for over 12 million deaths each year (USAID, 1990). For instance, about 2.3 billion people across the world, most of them in developing countries, suffer from disease linked to water unavailability, inadequacy or contamination (POPLINE, 2000; UN, 1997).

Although these problems are diverse and complex, it can not be denied that one of the most important factors behind them is the non-sustainability of community-managed rural water supply schemes. Governments, nongovernmental organisations (NGOs) and donor agencies are striving to scale up water supply and sanitation coverage in developing countries at the same time as the non-functionality rate of those water supply schemes installed is increasing. It is an alarming fact that, in most developing countries, an estimated 30% to 60% of existing rural water supply schemes are inoperative at any given time (Brikké and Bredero, 2003), with serious impacts on the health and welfare of the people.

Several factors affect the sustainability of water supply schemes in rural areas. A water supply service is sustainable if (Brikké, 2002):

- It is functioning and being used;
- It is able to deliver an appropriate level of benefits in terms of quality, quantity, convenience, continuity and health to all, including the poorest women and men;
- It continues to function over a prolonged period of time (which goes beyond the lifespan of the original equipment);
- Its management is institutionalised;
- The management of the service involves the community (or the community itself manages the system);
- It adopts a perspective that is sensitive to gender issues;
- It establishes partnerships with local authorities;
- It involves the private sector as required;
- Its operation, maintenance, rehabilitation, replacement and administrative costs are covered at local level through user fees or through alternative sustainable financial mechanisms;
- It can be operated and maintained at local level with limited but feasible external support;
- It does not affect the environment negatively.

Thus, the dimensions of sustainability of a water supply scheme and its service delivery are multifaceted. There are social, technical, financial, institutional and environmental issues to address (Brikké and Bredero, 2003). To sustain water supply schemes, it is vital to have the involvement of all segments of the community, in the form of full participation and control over the scheme's operation and maintenance (O&M), overall management, strategic decision making, ownership and cost sharing for O&M and construction activities (Lockwood, 2004). Such community management has to be backed by the technical support/assistance of external agents (government and/or NGO) over a long period of time, relating to O&M, training, monitoring, information collection, coordination and facilitation aspects (Lockwood, 2004; Brikké and Bredero, 2003).

Sustainability issues are also associated with the ability to give backstopping support to the new community indefinitely; to bring legal accountability to financial management by auditing Water and Sanitation Committee (WATSANCos); and to facilitate disagreements and resolve conflicts (Schouten and Moriarty, 2003). Moreover, several actors, at different levels and degrees of participation, have to be involved to sustain community-managed water supply schemes. These include the community in which the service is being delivered, government Woreda Water Resources Development Offices (WWRDOs), NGOs working in the water sector and private service providers (construction and maintenance activities and supply of spare parts) (IRC, 1993).

2 Research background and methodology

2.1 Background to the study area

Alaba is one of the eight special Woredas[1] found in the Southern Nations, Nationalities and Peoples Region (SNNPR). It is located north of the main road between Shashamene and Wolayita Sodo, on a gently sloping bank of the Bilate River, with an elevation ranging from 1,700 to 2,200 metres). Regarding the agro-ecology of the area, 86% is *woina dega* (or moderate to cool sub-humid – mid-altitude) and 14% mainly *kolla* (low land). The mean annual rainfall ranges between 759 and 1,241 mm. The monthly mean maximum temperature ranges between 24.9 and 29.90°c; the monthly mean minimum temperature is between 6.7 and 13.8°c (WA, 2001).

The total population of the Woreda in 2006 was estimated at 222,991, with about 12.2% residing in urban areas and 87.8% in rural parts (FDRERA, 2007). The Woreda covers a total area of 973.76 square kilometres. The special Woreda is bounded by Silte zone in the north, Oromia region in the east, Hadiya zone in the west and Kembata Tembaro zone in the southwest (FDRERA, 2007). Alaba Kulito, the Woreda town, is an important market and communications centre, and is accessible by asphalt road from Addis Ababa (313km) and from the regional capital (Awassa) (77km). All the rural villages are accessible in the dry period by means of a dry weather road.

Among the top 10 diseases frequently occurring in the Woreda are: intestinal parasites; skin infections; dysentery; gastroenteritis; and amoebae. These are directly related to the existing situation of a lack of clean and adequate water supply and poor hygienic practices and environmental sanitation. Before this research was conducted, water supply coverage in Alaba Special Woreda was around 40% (BoFED, 2006) and sanitation coverage was about 27% (FDRERA, 2007). Owing to the deep groundwater table (97m to 360m), the Woreda is entirely served by deep boreholes. Out of the 76 rural kebeles[2] in the Woreda, only 24 have a potable water source from boreholes. Moreover, the non-functionality rate of water supply schemes in the Woreda before this study, as reported by the WWRDO, was 37% (AW-WRO, 2007).

2.2 Background to RiPPLE, GaP theme and the case study

RiPPLE (Research-inspired Policy and Practice Learning in Ethiopia and the Nile region) is a five-year programme, hosted by WaterAid Ethiopia and funded by the UK's Department for International Development (DFID). It is led by a consortium of four partners, including WaterAid Ethiopia; the Institute for Development Research (IDR) of Addis Ababa University; the Overseas Development Institute (ODI) of the UK; and the International Water and Sanitation Centre (IRC) of the Netherlands. The consortium works closely with the Bureaus of Water Resources (BoWRs) of the focus regions, the Ministry of Water Resources (MoWR) Research and Development Department, the Faculty of Journalism and Communications at Addis Ababa University, Hawassa University and a variety of other academic, research, nongovernmental, consultancy and technology organisations.

[1] A special Woreda is a district (Woreda) which is not considered part of any zone.

[2] The smallest administrative unit of Ethiopia, similar to a ward or a neighbourhood.

The programme aims to advance evidence-based learning on water supply and sanitation. RiPPLES's research area covers planning, financing and sanitation services, linked with pro-poor growth. RiPPLE's research method is action research –working jointly with stakeholders to test new approaches and learn from their experience. Therefore, it works very closely with existing implementers in the water and sanitation sector. RiPPLE itself does not implement water and sanitation schemes, but it works in partnership with those who do (government, donors, NGOs and private institutions such as World Bank Woreda Support Groups), aiming to learn from their work. RiPPLE's research findings are intended to help implementers, as well as planners and donors, to improve services for the rural community.

RiPPLE works in three regional states of Ethiopia (Oromia, SNNPR and Benishangul-Gumuz) in different research thematic areas related to water supply, sanitation and hygiene. These are the Governance and Planning (GaP) theme; the Growth theme; the Finance theme; the Mapping theme; and the Sanitation theme. The aim of the GaP theme is to identify appropriate and scalable approaches to strengthening local water governance and planning in the context of Ethiopia's Universal Access Plan (UAP) and other development planning frameworks.

A particular focus is on mechanisms for ensuring effective and efficient participation by water users. The theme attempts to look into: how planning functions in theory and practice and how water users are involved; what the incentives and barriers are to stakeholders playing a more active role in decentralised water, sanitation and hygiene (WaSH) governance; what the potential is for more coordinated provision of services; what is needed to achieve the goals of the UAP in a sustainable way, in terms of capacity, government roles at different levels, communities and external support; and, finally, how can all of these be strengthened.

Water supply and sanitation coverage in Ethiopia is among the lowest of all developing countries and even of most countries in sub-Saharan Africa. The country's water supply sub-sector has encountered a number of challenges throughout its development. Some of the factors that have affected the development process of the water supply sub-sector are as follows (MoWR, 2006):

- Water supply has not been reliable and sustainable;
- Water use has not been efficient;
- Programmes and projects have not been objective-oriented;
- Plans have not been certain and clear;
- Water schemes have lacked a focus on good O&M of services;
- Integrated water supply and sanitation services have not been achieved; and
- There has been a lack of understanding that water demand includes livestock.

At present, national safe water supply and sanitation coverage have reached 42.2% (41% rural and 78% urban) and 30% (21% rural and 80% urban), respectively (MoWR, 2007). The Ethiopian government (subsequently the regional governments) adopted the National Water Resources Management Policy in 1999 (MoWR, 1999) so as to increase and sustain water supply services in both rural and urban areas. The overall goal of the policy is to enhance and promote 'efficient, equitable and optimum utilisation of water resources' for sustainable socioeconomic development.

The policy recognises that water resources development, utilisation, protection and conservation go hand-in-hand and ensures that water supply and sanitation, irrigation and drainage as well as hydraulic structures, watershed management and related activities are integrated and addressed together. Moreover, the policy stresses that water resources management has to integrate the development goals of other sectors, such as health and agriculture. The policy follows the principle that the water supply sector has to ensure that every Ethiopian citizen has access to water of acceptable quality to satisfy their basic human needs.

The government later adopted the UAP to scale up the water supply and sanitation coverage of the country and achieve 100% water supply coverage in most of the rural regions by 2012 (MoWR, 2006). This includes the SNNPR. To attain this target, the UAP assumes that, to make water supply schemes sustainable, hand pumps have to be made locally and repaired by local technicians and, generally, pumps and generators have to be standardised in relation to village-level operation and maintenance (VLOM) for sustainable service (ibid).

It has been estimated that 33% of rural water supply schemes in Ethiopia are non-functional at any time, owing to lack of funds for O&M, inadequate community mobilisation and commitment and a lack of spare parts (MoWR, 2007). With regard to this issue, the UAP aims to rehabilitate and maintain existing water supply schemes in the first two years of its seven-year plan, so as to develop a maintenance culture and increase the sustainability of both the newly constructed and the existing water supply schemes (MoWR, 2006).

In the study region, SNNPR, overall water supply and sanitation coverage in 2006 were at 48% (45% rural and 60% urban) and 22%, respectively (BoWR, 2002; 2006). There were 1,304 hand dug wells, 1,678 shallow wells, 421 deep wells, 2,686 spring developments with distribution points and 255 springs with network distributions, constructed by the regional government and NGOs in recent years (BoWR, 2006). However, it has been noted that a large number (22% to 24%) of the water supply schemes are non-functional at any given time (ibid), implying negative impacts on coverage and on the attainment of the UAP. To this end, the SNNPR BoWR aimed to increase the sustainability of water supply schemes from the current 76% to 95% within seven years (ibid).

With this in mind, the RiPPLE GaP theme undertook a sustainability case study in the two selected study areas, namely Mirab Abaya Woreda (discussed in RiPPLE Working Paper 4) and Alaba Special Woreda, to examine functionality and service levels of existing water supply schemes and to identify factors impacting on sustainability, following a bottom-up approach and offering recommendations for best approaches and practices for the upcoming Long-term Action Research (LAR) areas. This paper addresses the case of Alaba.

2.3 Objectives of the study and research questions

The general objective of this study was to assess the sustainability of water schemes, i.e. to investigate whether user communities will continue to use a new scheme after the project implementer has phased out and whether they are willing and capable to face any challenges or whether they will resort to previous habits in response to hardware or software failure. The specific objectives of the research were as follows:

- To assess the functionality and service level of existing water supply schemes in the Woreda;

- To examine the institutional, technological (including environmental) and financial factors impacting on sustainability of schemes;
- To examine links between participatory planning, social accountability, governance and scheme sustainability; and
- To identify issues for best practice guidelines for development practitioners to bring about improved sustainability.

To achieve the above objectives, research questions were developed, for which different sustainability indicators were identified and checklists were subsequently developed.

2.4 Tools, methods and sampling

To answer the research questions and achieve the subsequent objectives, a mix of both qualitative and quantitative data collection instruments was agreed up on by GaP team members. Draft checklists (Annex 1) were developed based on the sustainability indicators and specific objectives identified during the regional Learning Practice Alliance (LPA) meeting. The final and contextualised checklists were prepared after the research team had carried out a situational analysis of water supply and sanitation by reviewing important documents available at the Woreda and regional levels and had held preliminary discussions with key stakeholders (WWRDO, the Woreda Health Office, Water Action – a local NGO) in the Woreda for one week (1 to 7 November 2007). The checklists were developed to guide the data collection process during the survey. The specific methods and instruments used for the collection of data and other information for the research included:

- A **documentation review** was carried out of all available documents regarding water scheme plans, implementation and monitoring and evaluation at Woreda and regional levels. Sustainability principles and concepts were also consulted.
- **Water source and point mappings** were conducted to identify the location and key details of all the available water sources and points in the rural part of the Woreda. GPS (global positioning system) was used to identify the grid reference (longitude and latitude) of all the water sources and points. Observation of each water point and source and consultation with users took place to collect basic water source and water point data. In addition, a checklist with qualitative information system (QIS) questions was developed to assess water users' satisfaction at each water point.
- **Institutional and stakeholder mapping** was employed to identify the roles and responsibilities of different stakeholders and the gaps and the overlaps between different stakeholders, to see how different organisations/ stakeholders interact.
- **Resource mapping** provided a detailed overview of the human, physical and information resources available for service provision. This covered all important actors in service provision in the Woreda.
- **Field visits and observation** took place of operations and activities relevant to the sustainability of water schemes to develop a holistic perspective, i.e. an understanding of the context within which the schemes operate at each water point.

- **Focus group discussions (FGDs), key informant interviews and knowledge, attitude and practice (KAP) survey:** Additional information, or information to supplement the documentation review and considered necessary to obtain a deeper understanding of the issues, was collected through interviews and discussions conducted with those considered the main stakeholders.

Data collection activities were then divided into community (scheme) level and Woreda level. At community level, the following were conducted in the eight schemes selected for study in the Woreda: FGDs for WATSANCos and residents in each user community; WATSANCo resource mapping; and key informant interviews and KAP surveys. In addition, water source and point mappings were conducted at all of the 24 schemes and 65 water points found in the Woreda. At Woreda level, the following took place: institutional resource mapping; institutional and stakeholder mapping/analysis; and interviews and KAP surveys of the WWRDO, the Health Office, the Woreda Administration and Water Action. In addition, an FGD was conducted at the WWRDO.

Pre-tested water source and point checklists were used for water point and source mapping, and all of the 65 water points and 24 sources were visited and mapped during the survey. The checklists included information on grid references; functionality; technology type; financing and installing organisations; source conservation and protection; user satisfaction; etc**.** This was supplemented by observation, consultation and QIS questions, as noted above.

To undertake an in-depth study, because of the dependence of different kebeles on a single scheme, scheme-based sampling was adopted. In the selection of the schemes, two major stratifying factors for sampling were employed. These were the type of pump installed and the functionality (or non-functionality) of the scheme. Based on this, 30% (eight) of the schemes, including four functional and four non-functional, were randomly selected for detailed analysis. Since all the schemes were motorised, pump types were taken into consideration and six schemes with submersible and two with mono-lift pumps were selected. Four of the non-functional schemes visited for detailed analysis were First Ansha, Bendo, Ashoca and Lower Lenda. The functional schemes selected included: Debeso, Lower Arsho, Upper Tuka and Choroqo. Of the operational schemes, Choroqo has a mono-lift pump and the other three have submersible pumps. Of the four non-functional schemes, Ashoca has a mono-lift pump and the other three have submersible pumps.

FGDs were conducted in the eight schemes to collect information from WATSANCos and user communities. These used a semi-structured questionnaire guide. In the FGDs conducted at community level, only women participated, owing to their water fetching role and in order to avoid the cultural influence of men during the discussion. Each FGD had five to 12 participants of almost the same socioeconomic background. Resource mapping of all the eight schemes investigated their human, financial and material resources. In addition, in all eight schemes, key informant interviews with elderly people and KAP surveys with residents and water users were conducted. Furthermore, interviews were conducted with the eight kebele chairpersons to understand the role of the kebeles in scheme management.

2.5 Study implementation

After the checklists were contextualised, the data collection process began (26 November). The study took a total of three months (26 November to 26 February 2008) from the field activity to

report write-up. The case study was undertaken by a research group made up of five individuals, one from each of the key stakeholder institutions in the Woreda (WWRDO, Health Office and Water Action), the RiPPLE Woreda Facilitator and the consultant (guiding the research team). The research group was supported and guided by the RiPPLE GaP team and the RiPPLE Regional Facilitator.

The field activity took a total of five weeks and was carried out in two phases. In the first phase, scheme and water point mapping and FGDs took place in parallel at the community level. The help of team members from the Woreda sector offices and Water Action and of the RiPPLE Woreda Facilitator was indispensable right from the beginning. As they have been working in the Woreda for a long time and have frequent contact and good relationships with the community, their role in communicating with the local community and recruiting individuals to help the team translate interviews and FGDs was crucial. There were invitations to lunch and to drink soft drinks, coffee or tea; the team welcomed and accepted these invitations.

In almost all cases, WATSANCos and Kebele Administrations collaborated fully in: executing the FGDs and interviews; WATSANCo resource mapping; gathering women from different user communities for the FGDs; giving interviews; participating in the FGDs; and showing the locations of water supply schemes in the different parts of the kebeles.

Water scheme and source mappings were carried out for each and every scheme and water point in a very detailed way. There were long hours of walking, sometimes more than four hours off the road (in 10 kebeles), and often more than three hours. Some kebeles are very far from the Woreda town (more than 100km). As a result, data entry in the field itself was impossible because of physical exhaustion. In some schemes, it was difficult to reach WATSANCo members.

Second phase activities took place at Woreda level, including institutional/ stakeholder mapping, interviews, KAP surveys, resource mapping and one FGD. As they were busy with office work, the role of individuals from sector offices and Water Action was not significant. However, the RiPPLE Woreda Facilitator and the RiPPLE-sponsored IDR student who joined the team were indispensable in facilitating the data collection process. The FGD at the WWRDO was participatory and welcoming; interviews, surveys and mapping were carried out successfully. However, at the Health Office, resource mapping was not possible owing to a lack of personnel assigned to help. Moreover, interviewing the Woreda Administrator was a great challenge as he was engaged in political matters and was unavailable in the area for many days. Overall, the field activity could be rated as a success thanks to the dedicated facilitation and direct support of the Woreda and Regional RiPPLE Coordinators.

Finally, after completing the write-up, findings of the case study were presented to the Woreda and regional LPA members for endorsement and identification of LAR areas. The Woreda LPA was established on 4 February 2008 and the case study was presented on 5 February. The findings were fully endorsed, with some comments to be incorporated into the final document. After this, findings were presented to the regional LPA, on 26 February 2008 and a few comments and suggestions were put forward to be incorporated into the document. After the findings were presented, LAR focus areas were proposed both by the Woreda and the regional LPA members. Finally, at the request of the regional BoWR, the findings, mainly focusing on water supply coverage, were presented during a workshop on the evaluation of water supply coverage in the region, organised by BoWR, in the presence of the Minister of Water Resources. Finally, owing to RiPPLE's active involvement, BoWR

recruited the organisation to the taskforce established during the workshop to prepare a water coverage calculation model to be used throughout the region in the near future.

2.6 Data analysis

Depending on the nature of the survey, different data analysis techniques were used. Data collected during scheme and water point mappings were analysed using Statistical Package for Social Science (SPSS) software Version 12 for Windows. The checklists were given numbers for identification purposes. Each question was identified by a variable name and, within variables, there were values and value labels for identification of information for each scheme and water point.

After coding the information for each checklist, a template for entering data was created. The coded data was then entered into SPSS and simple statistical computations, such as frequencies, means and percentages, were carried out. Information gathered from WATSANCos, users and the WWRDO during FGDs and from interviews with key informants, kebele chairpersons and water providers was grouped according to the checklist questions and category of respondents. Then, data from each category were summarised in different tabular matrixes according to questions and respondents to make it easier to compare different groups on specific issues. Finally, data were read carefully and related topics were highlighted with coloured markers. Topics and key words were then summarised and interpreted. Different views from different groups were also taken into consideration. The data collected from WATSANCos and water providers through resource mapping checklists were summarised in a tabular form to evaluate capacity. In addition, the information on stakeholder and task analysis was gathered through the development of a visual leadership and coordination model and used to identify the gaps and overlaps between different actors in the sector.

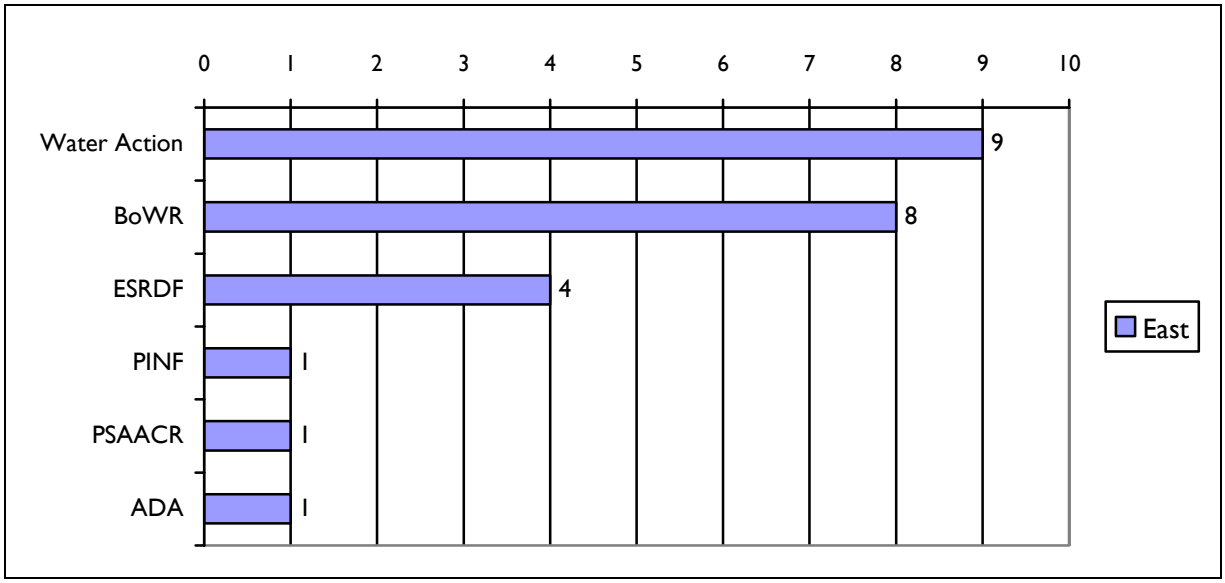
3 Findings

3.1 Sustainability, functionality and service level of water services

Alaba Special Woreda is known for its deep groundwater table. The Woreda is served entirely by deep boreholes with distribution networks to water points. During the survey, 24 motorised schemes with 65 distribution water points were visited and mapped. Only 24 kebeles out of the 76 rural kebeles were found to have improved water sources. In addition to the motorised schemes, there were about eight rain water harvesting facilities introduced by Water Action, in two kebeles (Hantezo and Tefo). The roof water harvesting structures serve the community only during the rainy season and one or two months after.

The majority (38%) of the schemes were installed by Water Action (Figure 3.1) and BoWR (33%). The rest of the schemes were constructed by the Ethiopian Social Rehabilitation Development Fund (ESRDF) (17%), the Prince Sultan Abdul-Aziz Social Committee for Relief (PSAASCR) (4%), the Alaba Development Association (ADA) (4%) and the People in Need Foundation (PINF) (4%). Financers of the schemes included: the government of Ethiopia (42%), WaterAid Ethiopia (29%), Oxfam GB (8%), PSAASCR (4%), ADA (4%) and the government of the Czech Republic (4%).

Figure 3.1: Number of schemes installed by different implementers



In the Woreda, there is a high rate of scheme and water point breakdown. During the survey, 42% (Figure 3.2) of the schemes and 62% of the water points were found to be non-functional (Table 3.1). Pump failure, generator problems and pump head problems accounted for 70%, 10% and 20% of scheme breakdowns, respectively.

Figure 3.2: Proportion of functional and non-functional schemes

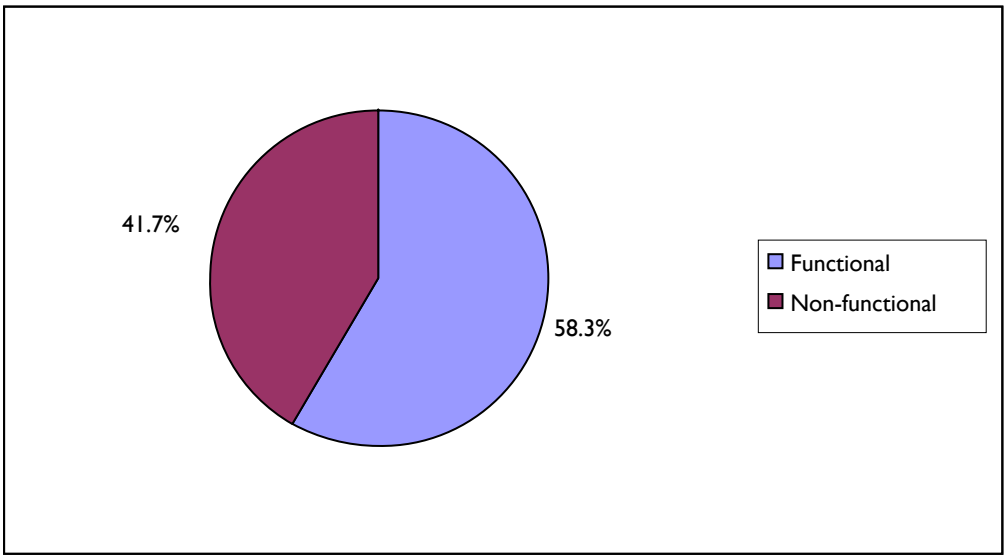


Table 3.1: Proportion of functional and non-functional schemes and water points

Pump type	Number of schemes			% of non-functionality
	Functional	Non-functional	Total	
Submersible pump	10	8	18	44
Mono-lift pump	4	2	6	33
Total	14	10	24	42
Water points	25	40	65	62

The followings were identified as the underlining causes of scheme breakdown:

- Lack of regular follow-up and supervision during the design and construction of schemes;
- Installation of inappropriate technology – use of mono-lift pumps; and
- Lack of trained operators and absence of timely servicing of motors.

Despite encouraging efforts to increase the water supply coverage, a high rate of non-functionality of recently constructed schemes has been observed in the Woreda. Moreover, with regard to technology type, schemes with mono-lift pumps are facing recurrent failure more frequently than are schemes with submersible pumps.

Out a total of 65 water points, 62% are not providing a service to the community. The major reasons for the non-functionality of water points include (Figure 3.3): scheme breakdown (70%), technical problems (18%), closure by the WWRDO owing to WATSANCo management problems (3%) and closure by the WATSANCo to save the money paid to tap attendants (8%). A total of 3% were still under construction.

Figure 3.3: Major reasons for the non-functionality of water points

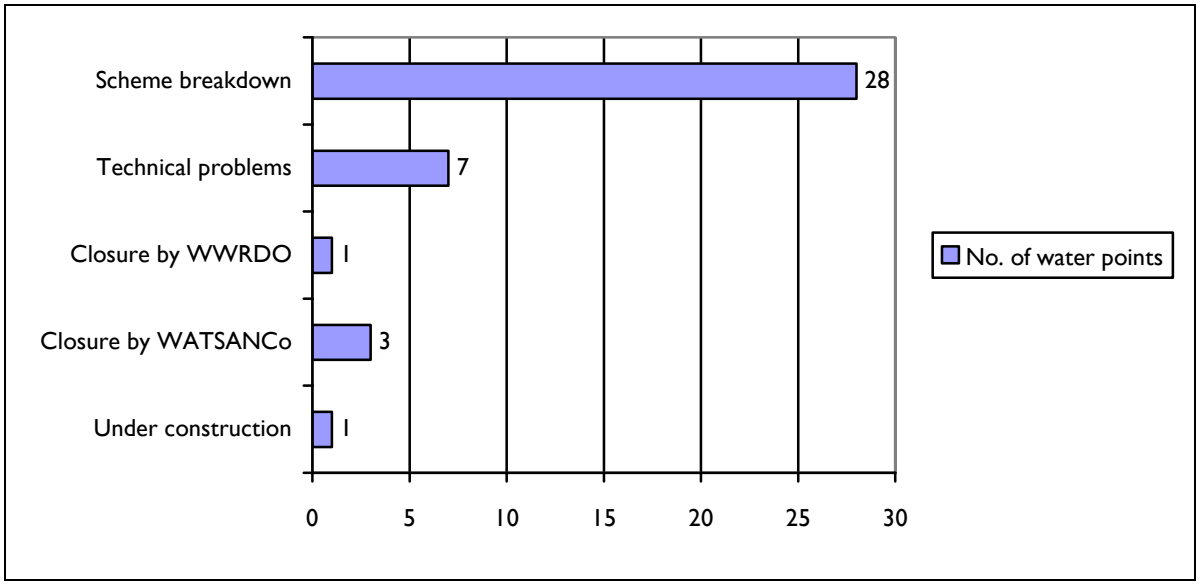


Figure 3.4: Non-functional water points at Lower Lenda and Ashoca

Figure 3.5: Non-functional scheme, Bendo

Table 3.2: Schemes and their important features[3]

No.	Kebele/scheme	Technology	No. points	Construction year (EC)	Installing org.	Financer	Design population	Served population	Current status	How long NF (ms)?	Generator brand	Pump type	Discharge rate (l/s)
1	Debeso	Motorised	3	1966	BoWR	Government	1,280	12,016	FN		Electricity	Submersible	3
2	Bendo	Motorised	2	1991	ESRDF	Government	3,981	0	NF	24	Lombardini	Submersible	3.9
3	Ajohulqo	Motorised	2	1999	Water Action	WaterAid	5,826	10,632	FN		Deutz	Submersible	7.3
4	Yataoberho	Motorised	3	1998	BoWR	UNICEF	7,665	0	NF	12	Deutz	Submersible	4.9
5	Felga	Motorised	2	1997	Water Action	WaterAid	7,970	0	NF	8	Electricity	Submersible	3
6	Upper Tuka	Motorised	1	1996	BoWR	UNICEF	4,000	11,401	FN		Deutz	Submersible	2.5
7	1st Tuka	Motorised	2	1995	ESRDF	Government	5,344	15,006	FN		Deutz	Submersible	4.5
8	1st Ansha	Motorised	1	1983	BoWR	Government	5,214	0	NF	108	Marellimotori	Submersible	2
9	Hamata	Motorised	2	1997	Water Action	WaterAid	6,155	4,724	FN		Lister Peter (TS3)	Mono-lift	0.5
10	1st Meqala	Motorised	2	1978	BoWR	Government	2,167	21,501	FN		Daewoo	Submersible	5
11	2nd Meqala	Motorised	4	1993	Water Action	WaterAid	8,131	0	NF	12	Deutz	Submersible	3
12	Ashoca	Motorised	4	1996	Water Action	WaterAid	5,583	0	NF	12	Lister Peter (TS3)	Mono-lift	4
13	1st Choroqo	Motorised	5	1996	Water Action	Oxfam GB	7,120	15,413	FN		Lister Peter (TS3)	Mono-lift	6
14	Alem Tena	Motorised	4	1996	Water Action	WaterAid	5,563	0	NF	12	Lister Peter (TS3)	Mono-lift	3.5
15	Qobochobare	Motorised	2	1978	BoWR	Government	3,991	16,255	FN		*	Submersible	2.22
16	Roqanene Tefo	Motorised	2	1978	BoWR	Government	2,854	8,829	FN		Daewoo	Submersible	2.6
17	Gofessa	Motorised	3	1995	ESRDF	Government	3,220	4,074	FN		Deutz	Submersible	3
18	W Gortancho	Motorised	1	1994	PSAASCR	PSAASCR	4,879	10,262	FN		Deutz	Submersible	4.4
19	Lower Arsho	Motorised	4	1995	ESRDF	Government	12,296	9,862	FN		*	Submersible	2.7
20	Besheno	Motorised	3	1991	ADA	ADA	6,685	0	NF	8	Deutz	Submersible	4.5
21	Lower Lenda	Motorised	6	1997	PINF	PINF	11,362	0	NF	18	Igeal	Submersible	3.8
22	Kulfo	Motorised	3	1995	Water Action	WaterAid	1,950	6,366	FN		Lister Peter (TS3)	Mono-lift	4
23	Eloloqa	Motorised	3	1997	Water Action	WaterAid	4,835	14,031	FN		Lister Peter (TS3)	Mono-lift	3
24	Gerema	Motorised	1	1988	BoWR	Government	3,504	0	NF	4	*	Submersible	4.4

Note: * No information available.

[3] The Ethiopian Calendar (EC) runs from September to September. The current year (2007-2008 of the Gregorian Calendar) is 2000 EC.

Every year, many millions of dollars are invested by national governments and international donor agencies alike in project implementation and, despite ever-increasing attempts to tackle the problem, many schemes still fail to maintain the flow of expected benefits over their intended lifetimes of 15 or even 20 years (Lockwood, 2004). About 21% (five) of the schemes have served beyond their design period of 15 years, with the replacement of some important parts, such as generators and pumps. Four of these schemes have been serving the community for more than 22 years, with the maximum being 34 years. These schemes include: First Meqala, Qobochobare and Roqanene, each with 23 years of service, and Debeso, with 34 years of service. Despite being in place for the past 17 years, the remaining scheme, First Ansha, has not been providing a service for about nine years. Out of all the non-functional schemes, about 90% were constructed in the past nine years; about 60% were constructed in the past five years. This indicates that most of the non-functional schemes have not even served their community for five years.

During the survey, it was difficult to find out about the design population of most schemes. Therefore, a uniform percentage growth method has been employed to project the current population, obtained from the Woreda Finance Office (Table 3.2). In addition, in none of the schemes has a user registration system been adopted. Therefore, to find out the number of people currently using each scheme, estimations have been made based on information obtained from WATSANCos, users, the WWRDO and Water Action. Results show that 92% of the schemes in operation have served far beyond their design population (Table 3.2).

When scheme breakdowns occur, the speed of maintenance is slow. Maintenance for minor breakdowns is performed within two weeks, whereas major breakdowns take a minimum of three months, with an average of 12 months. Despite recurrent efforts by BoWR to bring it into operation, First Ansha scheme has been unrepaired for the past nine years.

In 96.9% of the water points, users consume the water from the main source for all domestic purposes without any complaints about quality. However, in the remaining 3.1% of the water points, users consume the water for all domestic purposes but have some complaints on quality (turbidity of the water from the source). The WWRDO has never carried out any water quality tests or regular monitoring of the source and the water points. However, according to bacteriological and physiochemical water quality tests conducted by BoWR for selected schemes and water points, the bacteriological quality of the groundwater has been found to be good and safe for drinking, but a coliform count higher than the acceptable level set by BoWR (0 total coliform count) has been detected at the water points. Despite this, no effort has been made to disinfect the water using chlorine.

Physiochemical testing by BoWR for 14 selected schemes in the Woreda (Annex 2) has shown the presence of fluoride above the World Health Organisation (WHO) guideline value set for drinking water (1.5mg/l) (values ranged from 2.35mg/l for Gerema scheme to 13.1mg/l for Bendo scheme – Annex 2). Despite the excess fluoride content of the groundwater, only two schemes with fluoride content higher than the acceptable value set by BoWR[4] (3mg/l) were found to have a fluoride treatment plant. Moreover, in spite of the excess fluoride content of the groundwater, no physical symptoms of fluoride were observed during field investigation, except for a few individuals with

[4] BoWR has no water quality guideline but uses the draft guideline developed by MoWR.

tooth mottling. However, the effects of fluoride can take time to manifest themselves and steps should to be taken in order to ensure the long-term usability of the schemes.

In 94% of the water points, users reported that supply is predictable and is available both in the morning and in the afternoon (exact time not known). In the remaining 6%, supply is only available in the morning. The water points provide a service for five to 12 hours per day, with an average of eight hours. In most of the schemes with more than one water point, the points are not placed within a reasonable distance to serve the majority of the community. During FGDs, users said that the tap attendants usually open the water points when they see queuing around the water point (Figure 3.6). The time taken to fetch water from the main source ranges from 10 minutes to six hours (roundtrip), with an average of two hours and 15 minutes. These findings exceed WHO recommendations (WHO, 2006a), set at 30 minutes of walking time for a roundtrip, equivalent to a distance of about 1km. They also exceed the recommendations in the UAP, which plans to provide improved water to every rural dweller within a 1.5km radius by the year 2012 (MoWR, 2006).

Queuing time varies from season to season. During the dry season the queuing time ranges from 15 minutes to 13 hours, with an average of seven hours (Figure 3.7). In the wet season, the queuing time ranges from 15 minutes to six hours, with an average of three hours. Therefore, the average roundtrip including waiting time is found to be nine hours in the dry season and five hours in the wet season. In almost all of the schemes, women and girls are responsible for the collection of water. Hence, women and girls are expected to walk for a long time in search of water for household use (Figure 3.8). The number of individuals in a household for the users involved in discussions for all schemes ranges from three to nine, with an average of six individuals. We can therefore only imagine the workload women face to ensure the availability of water for six individuals in a household. Women and girls are expected to spend more than nine hours during the dry season to collect water from the main source, time which could otherwise be used for other productive activities. In addition, owing to the large amount of time spent queuing up, sometimes people return home without fetching water at all.

Figure 3.6: Queuing up waiting for the opening of the water point

Figure 3.7: Queuing up with jerry cans on both sides of the water point, front view

Figure 3.8: Women and girls travelling home after collecting water

The average quantity of water used from protected sources per household per day was found to be 63L, indicating that on average 10L of water is used per person per day. This finding indicates that per capita consumption of water in rural parts of Alaba is by 5L lower than the 15L standard set in the UAP (MoWR, 2006). The findings are also lower than those of Carter and Howsam (1999) and the WHO (2006a), which indicate that access to 20L of water per person per day is a minimum requirement in respecting the human right to water and minimum hygiene standards. During the wet season, the majority of the Woreda population, residing far from the improved sources, use unprotected sources like ponds, rivers and unprotected springs for all domestic purposes, including drinking (Figure 3.9). In most of the schemes, watering cattle during the dry season also takes place at the water points.

Figure 3.9: People fetching water from ponds, Felga

The interrelated issues of groundwater quality and quantity can best be addressed by management approaches encompassing the entire groundwater recharge areas or groundwater catchments (WHO, 2006b). The Ethiopia Water Resource Development Policy and the SNNPR strategic plan clearly indicate that conserving, protecting and enhancing water resources are central to using the resource on a sustainable basis (MoWR, 1999; BoWR, 2007). Schemes around which watershed management is being undertaken represent 20.5%, whereas no effort has been made at 79.4% of schemes. During the field investigation, no deliberate effort to conserve the groundwater resource and enhance its productivity was observed. However, in some places, the community was observed to have been rehabilitating degraded lands through the Safety Net programme.

The majority of WATSANCos are not properly recording and saving the revenue collected from water sales. In those schemes with good financial management, like Choroqo, or a strong committee, like Debeso, monthly income was found to be higher than expenditure (Table 3.3). The best schemes show income sufficient to cover even major repairs. However, in most schemes, tariff setting does not involve the community and does not take into consideration poor and marginalised people. Banking details of the visited WATSANCos are given in Table 3.4.

Table 3.3: Annual income and expenditure, Choroqo, 1997-1999 EC, Birr

1997 EC		1998 EC		1999 EC	
Income	Expenditure	Income	Expenditure	Income	Expenditure
12,659	4,104	16,631	9,637	19,378	12,213
Difference		Difference		Difference	
	8,555		3,994		7,165

3.2 Resource availability at the WATSANCo and Woreda level

Most WATSANCos do not have the necessary human, financial and material resources to undertake even minor maintenance (Table 3.4). Moreover, most WATSANCo members, tap attendants and operators report feeling that they have not received enough theoretical or practical training to undertake their work effectively and efficiently.

Table 3.4: WATSANCo equipment and saving

		Physical resources			Financial resources (savings)
No.	Kebele	Equipment	Type	Quantity	Amount in Birr
1	Ashoca	Spanner Combination wrench Pipe wrench Screwdriver	Unknown, Different sizes, 12", Unknown	1,5,1,1	9,000
2	Choroqo	Pipe wrench		2	21,000
3	Debeso	Pipe wrench	24"	1	67,000
4	Upper Tuka	Pipe wrench	24"	1	2,100
5	Lower Lenda	-	-	-	Never saved
6	First Ansha	-	-	-	Never saved
7	Bendo	-	-	-	Never saved

The WWRDO is under-resourced and receives an annual budget only for office administration costs (Table 3.5). No budget has been allocated for the other activities the office is expected to undertake, and it has been depending on the unreliable assistance of donors for expansion, spare parts purchase and per diem to undertake maintenance work. Recent hiring is improving the human resources situation but about 50% of positions are still vacant (Table 3.6). In addition, most of the occupied positions are held by individuals without the necessary qualifications or experience. Around 75% of the present technical staff in WWRDO have either a diploma from technical and vocational education schools (10+3) or an advanced diploma from Arbaminch University (Table 3.6). In the O&M team, crucial for scheme sustainability, the important positions (mechanic and electrician) are unoccupied.

Table 3.5: Budget allocated to and utilised by the WWRDO, 1995 -2000 EC

Year EC	Budget requested	Allocated	Utilised
2000	605,214	174,559	100%
1999	842,862	383,132	13% (only 48,600 released)
1998	-	56,510	100%
1997	-	61,636	100%
1996	-	59,342	100%
1995	-	14,600	100%

The WWRDO has one building with two offices and one workshop. The building was constructed in 2004 with the financial support of the United Nations Development Program (UNDP). The WWRDO has only three functional motorbikes, with the furthest scheme (Yato Behreo) about 105km far from Alaba town. In the workshop, different spare parts and hand tool kits, donated by UNDP and PINF (Figure 3.10), important for minor maintenance, were seen. The WWRDO does not have the human, finance and logistical resources to undertake major maintenance (Table 3.6).

Figure 3.10: WWRDO and spare parts and hand tools donated by PINF and UNDP

The prominent local NGO, Water Action, also has limited human resources (Table 3.7). The NGO has been constructing water schemes for the past five years to solve the prevailing water problem in the Woreda. As a principle, the NGO does not provide support to the WATSANCo after the scheme is handed over to the community. However, the NGO provides the necessary training, spare parts and hand tools before the handover takes place. During field visits, many spare parts were observed in the NGO's store. However, the NGO does not have the necessary human and logistical resources to undertake scheme maintenance in the case of breakdown. The NGO also lacks the necessary technical capacity to undertake supervision during project implementation by respective consulting institutes through bidding. Most positions are occupied by support staff (Table 3.7).

Table 3.6: Human and physical resources of WWRDO Water Supply Department

Human resources						Physical resources			
No.	Position	Sex	Quals	Years	Type	Resource	No.	FN	NF
1	Office head	M	Diploma	4 months	-	Building	1	1	0
1.1	Secretary	-	-	-	Support	Offices and workshop	2, 1	3	0
1.2	Administrative service	-	-	-	Support	Computers	1	1	0
1.3	Archivist	-	-	-	Support	Photocopier	1	0	1
1.4	General service officer	M	Diploma	4 months	Support	Printer	1	1	0
1.5	Plan and programme expert	M	-	-	Technical	Phone line	1	1	0
						Generator	0	0	0
2	Water Supply Improvement, Community Participation and Training Department					Private water scheme	0	0	0
2.1	Department head	-	-	-	Technical	Motorbike	4	3	1
2.2	Training expert	M	Diploma	4 months	Technical	Pedal cycle	1	1	0
2.3	Water supply improvement study expert	M	Diploma	4 months	Technical	Overhead projector	0	0	0
2.4	Community promoter 1	M	Cert.	9 years	Technical	Yashica camera	1		
2.5	Community promoter 2	-	-	-	Technical	Car	0	0	0
3	Water Resources and Quality Control Team					Drilling machine	1	1	0
3.1	Team leader	M	Diploma	2 years	Technical	Grinding machine	1	1	0
3.2	Water engineer	-	-	-	Technical	Pipe wrench	36	36	0
3.3	Assistant water engineer	M	Diploma	1 year	Technical	Pipe cutter	4	4	0
3.4	Surveyor	-	-	-	Technical	Pipe stand	4	4	0
3.5	Water quality technician	M	Diploma	4 months	Technical	Pipe trader	6	6	0
4	O&M Team								
4.1	Team leader	M	Diploma	1 year	Technical				
4.2	Mechanic	-	-	-	Technical				
4.3	Plumber	M	Cert.	2 years	Technical				
4.4	Electrician	-	-	-	Technical				

Table 3.7: Alaba and surrounding area water and sanitation programme human and physical resources

No.	Position	2003	2004	2005	2006	2007	Type
1	Water Unit						
1.1	Programme Manager	1	1	1	1	1	Technical
1.2	Foreman	2	1	1	1	1	Technical
2	Resource Administration						
2.1	Head	1	-	-	-	-	Support
2.2	Driver	2	1	1	1	1	Support
2.3	Cleaner	1	1	1	1	1	Support
2.4	Guard	3	3	3	3	3	Support
2.5	Storekeeper	1	1	1	1	1	Support
3	Community and Health Unit						
3.1	Community Development Officer	1	1	1	1	1	Technical
3.2	Health Officer	2	2	1	1	1	Technical
Physical resources							
Toyota car							1
Motorbike							2
Pedal cycle							2
Computer							1
Printer							1
Photocopier							1

3.3 Knowledge, attitude and practices (KAP) of service providers and users

3.3.1 Users

In most of the schemes, owing to the centralised approach followed by the implementers, participation of the community in different phases of scheme development was very poor. In addition, except with regard to fetching water when the scheme is in operation, the community does not actively participate when there is a breakdown. Even if the community is interested in participating in O&M and believes that involvement is important for scheme sustainability, little/no effort has been made by WATSANCos and the WWRDO to involve the community. Generally, the community does not know clearly its role and responsibilities in water service delivery and management and considers the WATSANCos and the WWRDO to be responsible bodies in scheme O&M. The field investigation observed that most of the non-functional schemes and water points had no fencing: fences had been removed as a result of poor attention paid by the community. With regard to water resource management, the awareness of the community is poor. In most of the schemes, the community believes the source is a 'hidden sea underneath' which can not be depleted and can be used forever. No deliberate effort to conserve the groundwater resource and enhance its productivity has been observed.

3.3.2 WATSANCos

Most of the WATSANCos reported that they are working hard to satisfy the increasing water demand of the community. However, it was observed that the WATSANCos do not clearly know their roles and the roles of others in water service delivery and management. Most of the WATSANCos have not received enough theoretical or practical training to undertake their work effectively and efficiently. In most of the schemes, the WATSANCos depend on the WWRDO for scheme maintenance and spare parts provision. Many WATSANCo members reported feeling discouraged owing to the absence of incentives.

There is no clear understanding among users, WATSANCos and the WWRDO regarding WATSANCo accountability. No committee has regularly reported on finance or other activities, either to the community or to the WWRDO. Most of the WATSANCos have poor financial management systems and no financial documents.

3.3.3 Woreda level

Despite the fact that the WWRDO has been given a number of responsibilities, performance regarding the annual and strategic plan is very poor. The WWRDO has no permanent head fully engaged in and performing the office's day-to-day activities. The office head is not a water expert by profession, although he has received a number of trainings related to water supply and sanitation and has rich experience in the sector.

In the Woreda there are serious problems owing to the high investment cost of source development and the unsustainability of constructed schemes. Even though the Woreda Administration knows of these problems, it has still been allocating a very limited budget to the sector. According to the office head, the initiative of the communities and Woreda Administration are the major motivating factors, whereas the major factors hindering day-to-day activities are: the absence of sufficient and practically trained human power; the lack of a budget to the sector; the lack of the necessary logistics to

support the WATSANCos; and the absence of time to deal with office activities, owing to additional workloads and to the lack of commitment of some office experts. The office does not coordinate with other actors and sector offices to help the WATSANCos and everyone is busy with their daily work. Generally, the WWRDO does not provide the necessary support to the WATSANCos owing to a lack of the necessary human, finance and logistical resources in the office.

Water Action has only very few human resources with the necessary qualifications and experience, who take care of all the organisation's activities. The programme manager reported that there is good team sprit and integrity among staff members, which motivates everybody to work hard. Compared with other actors, the NGO has a good profile in terms of bringing different stakeholders together through a steering committee composed of the important actors in the sector. Despite this initiative, no effort has been made to coordinate with these actors to support the WATSANCos. In the NGO, there is no detailed and centralised system to provide information on previous activities, which seriously affects the NGO's regular activities. This owes partly to the high turnover of individuals assigned to management positions.

4 Discussion

To ensure effective community management of rural water projects to achieve sustainability, both internal and external factors must be taken into consideration, as both make important contributions to the success and/or failure of water projects. Internal factors such as lack of community cohesion, lack of management skills, unrepresentative water communities, technical issues, strong traditions, misplaced priorities and financial problems must be given priority under a community management model (Schouten and Moriarty, 2003). On the other hand, external factors, such as non-existence of or weak supply chain, lack of standardised technologies, poor design and construction faults, interference from politicians and environmental issues have a big impact on the sustainability of the system and therefore need proper handling (ibid).

4.1 Institutional factors

4.1.1 Capacity of WATSANCos, WWRDO and Water Action

A water committee is an often voluntary body, selected by the community to represent it in discussions and decision making on all aspects of local water management. If a committee is going to function smoothly and meet the needs of the community it represents, it should represent all segments of the community, better off and poor, male and female, groups living in different areas (Bolt and Fonseca, 2001). The users in six schemes (not Bendo and Lower Lenda) said that the WATSANCos were elected through the active participation of the community. The WATSANCos of these schemes affirmed that there was public participation during their elections. The users of Bendo scheme, however, said that the WATSANCo were elected by the kebele Council and WWRDO without the participation of the community. The chairperson of Lower Lenda scheme said that during the first election (1994 EC), only the kebele Council members and influential people participated; however, during the second (1997 EC) and third elections (1999 EC), to replace reluctant and weak members of the committee, the community participated actively and the election was democratic. The users of Lower Lenda scheme, however, claimed that they were not invited to take part in the WATSANCo election. They added that women had never participated in water-related issues.

> An elderly woman in Lower Lenda said: 'No-one has ever before heard our voice with regard to water supply, which is women's major concern. Today, even though you are here not to provide us with water, we feel as if we have had a result. Because you are here at least to listen to what women say about water.' An elderly man affirmed that the community had no participation during the WATSANCo election.

According to the WWRDO experts, the election of the WATSANCos might take place with community participation or the individuals might be selected by the kebele chairperson and the list sent to the office. They experts added that a lack of human and financial resources and a lack of commitment from the office experts were the major obstacles for community participation. The experts reported that better community participation had been observed in WATSANCos established by Water Action compared with WATSANCos in schemes constructed by other implementers.

According to the WATSANCos of Choroqo and Ashoca, the criteria for WATSANCo members' selection were set by Water Action in consultation with the community: is literate, honest and responsible, shows active participation, has no additional community responsibility and is gender sensitive – more than 50% of committee members should be female. According to the WATSANCos, key positions, like the chair, cashier, storekeeper and purchaser positions, are reserved for females. They added that a meeting was called through the kebele for the selection of the WATSANCos and the election was democratic: all kinds of community members participated, both to elect and to be elected. The election was facilitated by the project implementer of Water Action and the kebele chairperson in the presence of religious leaders and Woreda Administration representatives. According to the WATSANCos of other schemes, in FGDs, the criteria for existing WATSANCo members' selection were social acceptance, trustworthiness, literacy and consideration of women. The WWRDO experts affirmed that gender consideration, willingness to work without payment, no additional community responsibility and literacy were the major criteria for selection. They added that it was difficult to find females who can write and read and keen to volunteer (because of their husband's influence).

Except in Lower Lenda, Choroqo and Ashoca, WATSANCo members were elected only from the kebeles where the schemes are to be found. The WATSANCos said that this approach was used for the sake of close examination; patrol of the water scheme; immediate report in case of breakdown; and a sense of ownership in the community close to the scheme. All the WATSANCo members said that it is very difficult to meet and hold a discussion with distant users in case of emergency incidents. However, during the fieldwork, it was observed that the water points are open to everyone who can pay for the service, irrespective of location. Factors such as poverty and marginalisation were not considered during the elections.

> One WATSANCo member at Ashoca scheme said: 'It is not ethnical to group the community into poor and rich, since we all have almost the same status.'

All the WATSANCos said that term and duration of membership were not defined during the elections. They added that an individual continues to be a member indefinitely unless he/she acts unlawfully. The committee has no limited service period and members serve as long as they have community acceptance. The committee at Choroqo said that two committee members had changed owing to weak performance, but the other four had been working since the first election in 1995 EC. Members in Ashoca said that four of the original committee members had been changed because they could not read and write even though they were thought literate during the election. According to WATSANCos in the other schemes, replacement of WATSANCo members took a very long time owing to a lack of effort from the WWRDO. The absence of regular follow-up and supervision and lack of immediate measures taken against those who had acted unlawfully in mismanaging the scheme's financial resource was observed in most of the schemes.

According to the resource mapping of the eight selected schemes and discussion with the WATSANCos, women have been taken fully into consideration (Table 4.1): of the seven positions, four have been given to women in the WATSANCos of the schemes constructed by Water Action (Choroqo and Ashoca). In addition, key positions, such as the chair, cashier, storekeeper and purchaser positions, have been taken by women. According to the Water Action Program Manager,

women are prioritised because of their direct concern regarding water. He added that this achievement is the result of continuous sensitisation and promotion work by the NGO to break the cultural dominance and influence of men over women. In the other six schemes, women were not prioritised and most key positions are taken by men. The role of women in the schemes has been greatly weakened by the cultural influence of men. WWRDO experts said that WATSANCos organised by Water Action can be taken as a very good model owing to the active role of women in decision making. During the fieldwork, it was observed that in the schemes managed by women there was good financial management compared with the schemes managed by men. In addition, users are satisfied with the management capacity of these committees.

Generally, in Water Action schemes, women are on the right track to make decisions on their own issues; in other schemes, it seems that women have been elected only as a formality. This poor participation of women is attributed to a lack of community sensitisation and promotion of women by implementers and the WWRDO. It could also undermine women's role in decision making on their own issues, such as tariff setting, service delivery improvement and effective scheme management.

Figure 4.1: WATSANCos of Choroqo and Debeso during FGDs

All the WATSANCos said that they were elected to serve the community without any payment, except per diem received for travel for various purposes. They added that they had not received any payment-based incentive so far. The WATSANCo at Debeso scheme said that the community had vowed during the election (1994 EC) to provide an incentive and prizes if the committee improved water service delivery and scheme management. They added that the institution had no bank account when they were elected but they had deposited about 67,000 Birr within six years. The chairperson and secretary of the scheme said that they were about to resign from their position owing to the refusal of the community to honour the promise made during the election. During the fieldwork, it was observed that the committee had about 67,000 Birr in the bank after paying 20,000 for electricity to the Ethiopian Electric Power Authority.

The WATSANCos of most schemes generally take the following as the positive factors in being a member: increased social acceptance; satisfaction at seeing people and cattle served at the schemes; and trainings and hygiene and sanitation awareness. The WATSANCos of some non-functional schemes said that they had lost social acceptance owing to the recurrent failure of the schemes. The

members of Lower Lenda WATSANCo said that they were not even allowed to take water for free. They added that they were about to resign owing to continuous complaints from the community and the recurrent failure of the scheme. The WATSANCo Organisational Manual says that committee members are expected to serve the community on a voluntary basis without any payment except per diem when members travel to perform the institution's activities and when there are trainings (BoWR, 2002). According to the WWRDO community promoter, using this, WATSANCo members could come frequently to the office to report, even on very minor issues which they could otherwise solve by themselves.

The WATSANCos are composed of seven members, including chairperson, finance head and secretary, scheme supervisor, cashier, purchaser, storekeeper and one member. In Water Action schemes, in place of a supervisor there are volunteer health communicators (VHCs) and there is also a technician supervisor position. In addition to the management committees, there are tap attendants, guards and operators: these are not members of the WATSANCo but are paid a monthly salary.

Each WATSANCo has received at least one training on financial, human and material resource management. The training was organised by the WWRDO with the support of UNDP. In addition, trainings were given to the WATSANCos by implementing organisations (Table 4.1) and BoWR. In Water Action schemes (Choroqo and Ashoca), seven VHCs at each scheme have been trained on hygiene and sanitation and minor maintenance. The VHCs promote hygiene and sanitation through a home-to-home service. In addition, tap attendants, operators and water technicians are recruited from among the trained VHCs. The chairperson in Ashoca said that five VHCs had stopped their work complaining about the low salary.

Table 4.1: Organisers and number of trainings given to WATSANCos

Scheme	No. members		No. trained members	Frequency of training	Organiser
	M	F			
Debeso	3	1	4	2	BoWR and WWRDO
Bendo	6	1	1	1	WWRDO
First Ansha	6	2	8	1	3 Water Action, 1 WWRDO
Ashoca	3	4	6	4	PINF
Lower Lenda	6	2	8	1	3 Water Action, 1 WWRDO
Lower Arsho	4	1	3	1	WWRDO
Upper Tuka	2	3	5	1	Water Action

Except for in Ashoca and Choroqo, tap attendants in the six visited schemes had not received training on revenue collection. Operators in all the schemes except Debeso received training on generator and motor operation. In Debeso, a new untrained operator was hired after the death of the trained operator. Most operators, except those trained by Water Action, reported that the training they received was more theoretical and could not help them solve even minor motor or generator problems.

WATSANCos in all the schemes except First Ansha said that a training manual was used during the training. The duration of the training varied from three to 10 days, depending on the organiser.

Generally, three-day trainings were given to the WATSANCos and operators by Water Action and the WWRDO. The WATSANCo and operator of Lower Lenda received 10- and five-day trainings, respectively. All the WATSANCos said that the trainers were skilled except in terms of time allocated for training. According to the WATSANCos, trainings were interesting and relevant to their work. Despite this, they complained of a lack of continuity and that no trainings were given to those who joined the committees late. WATSANCos in all schemes reported the need for regular refresher trainings in order to be able to properly manage the schemes and satisfy the increasing demand.

With regard to scheme maintenance, the WATSANCos of Ashoca and Choroqo reported the presence of technicians, trained by Water Action, to care of minor maintenance. They added that, as the schemes were motorised, it was more complicated to undertake major maintenance at community level, and well trained professionals and machinery were needed. The WATSANCos of all other schemes said they could not undertake even minor maintenance owing to a lack of trained technicians and the necessary hand tools at WATSANCo level. Generally, except for in Ashoca and Choroqo, there are no trained technicians or professionals to undertake minor maintenance, which is managed by the WWRDO and private technicians from Alaba town.

The field investigation discovered that only schemes constructed by Water Action (Choroqo and Ashoca) had a well furnished WATSANCo office and important hand tools for minor maintenance. No other schemes have an office, except Debeso, where the power house has also been serving as an office, or important hand tools to undertake minor maintenance, except Debeso and Upper Tuka, each with one 24" pipe wrench, and Lower Arsho, with two cutters and one pipe trader (Table 3.4).

Figure 4.2: Hand tool store and WATSANCo office at Ashoca and Choroqo

Figure 4.3: Operator of Upper Tuka with the only maintenance tool, a pipe wrench

Users in all the schemes except Choroqo and Ashoca said they were dissatisfied with WATSANCo management. The reasons given were mostly the same. The major reasons cited by the majority of users included: low speed of maintenance; lack of transparency on financial matters; delayed opening times of water points; and unreliability of schemes owing to recurrent failure. Users at Lower Arsho, Bendo and Upper Tuka said that WATSANCos lacked transparency and had been using the tariff collected for their own private purposes. They added that most committee members lacked commitment and needed to be replaced by those who were committed and transparent. Users at Lower Lenda, Bendo and First Ansha said they had been without water for quite a long time owing to frequent breakdowns. According to users in most schemes, tap attendants usually opened the water points when they saw queues.

Users at Choroqo and Ashoca complained about the lack of transparency in financial matters. Users at Choroqo were generally satisfied by the management capacity of the committees and said the scheme had been providing a service since its construction without major breakdown. Despite the non-functionality of the scheme at Ashoca, users said they were satisfied with the committee's management capacity. They said that the scheme breakdown and the slow speed of maintenance are beyond the capacity of the committee and it is the implementing organisation that is responsible for the scheme's recurrent failure.

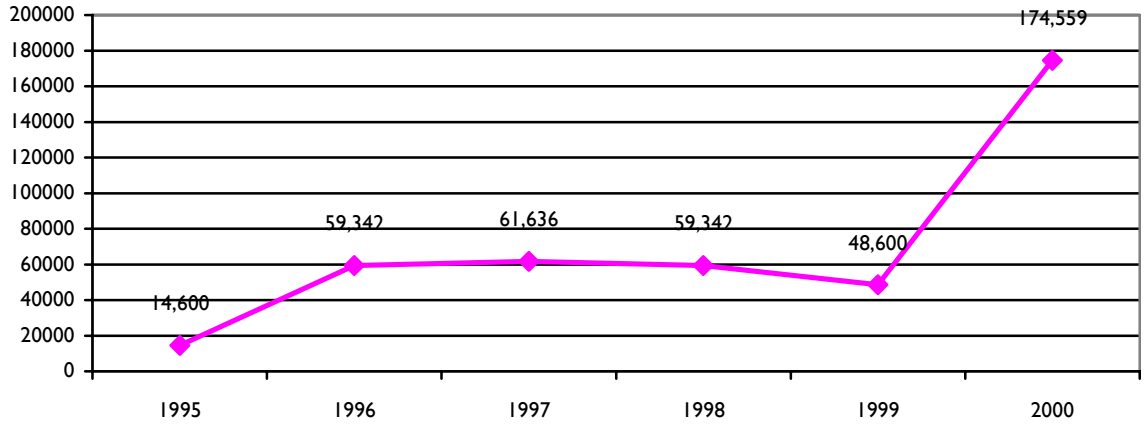
According to WWRDO experts, there are many low performing WATSANCos in the Woreda, including First Meqala. The experts said that committee members do not want to contact the WWRDO and the community and are mismanaging scheme finances. Despite 22 years of service, according to the experts, the scheme has less than 2,000 Birr in the bank. During the field investigation, it was observed that one of the water points was closed by the WWRDO owing to mismanagement of revenue collected. Currently, only one water point is giving a service to a very high number of users who rely on the scheme. The committee has been dissolved; only one tap attendant has been collecting the revenue and keeping the money himself. One expert said that the role of the office in dealing with this mismanagement should be important, but owing to a lack of logistics and staff commitment, only a little effort was exerted. According to the WWRDO experts and the WATSANCos, major factors impacting the management of schemes are: absence of incentives for the WATSANCos; lack of training; recurrent scheme breakdown; high force required

to start up motors of some schemes; bad trends of previous WATSANCos (misuse of finances – but not accused); and, in some schemes, lack of a sense of ownership. During the field visit, it was observed that only the WATSANCos established by Water Action received a number of trainings and had a solid management system.

In the WWRDO strategic and annual plan, there was no direct support for the WATSANCos expressed in terms of budget or human resources. According to the office experts, there was no direct support except help in the case of minor breakdowns or mismanagement. They added that the office receives an annual budget from the Woreda Administration only for office administration costs, and there is no budget for maintenance, expansion or new scheme development. If the office is lucky and receives money from donors, it uses this to purchase important spare parts and hand tool kits for minor maintenance and expansion, but it is difficult to include this in the annual plan as the source is not predictable. During the field investigation, only spare parts and hand tool kits donated by UNDP and PINF were observed in the workshop of the WWRDO. According to information obtained from the WWRDO, there is a big difference in the budget requested by the WWRDO and the amount released by the Woreda Administration for the 1999 and 2000 EC fiscal years (see Table 3.5).

The chairman of the Woreda Administration said that the sector's problems were well known. He believed that resolution of the water supply problem needs more than efforts by the Woreda Administration alone. He added that, despite the Woreda's budget deficit, the Administration had been trying its best to play its part in solving the human and financial problems of the WWRDO. He said that, compared with previous fiscal years, the Administration allocated a big budget in 2000 EC to the WWRDO to recruit new professionals, and around 40,000 Birr for scheme maintenance. He felt that the budget allocated was not still enough but the Administration had taken into consideration the budget allocated by NGOs to the sector. The WWRDO experts said that the last five-year strategic plan did not considered the real capacity of the office with regard to human, financial and logistical resources. They reported that accomplishments are very few, especially in community development (under 10%); in sanitation, achievements are insignificant. According to the experts, in the annual plan, achievements have been relatively good regarding scheme maintenance. The evaluation document, assessing the achievements of the last five-year plan, affirmed the improvements in scheme maintenance.

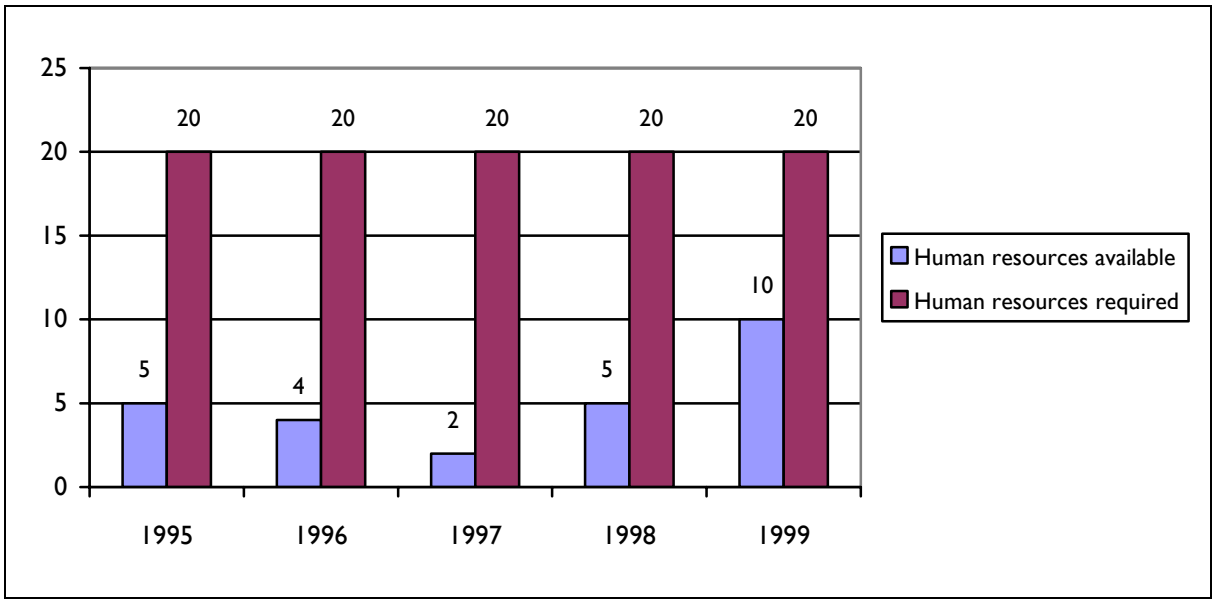
Figure 4.4: Budget released to the WWRDO, 1995-2000 EC



The higher amount of budget allocated for 2000 EC (Figure 4.4) covers salaries of the additional staff recruited by the office and the extra 40,000 Birr allocated for scheme maintenance activities.

The WWRDO also has limited human and logistical resources to undertake its activities. The resource mapping showed that the number of positions in the office and the number of human resources present are not comparable (Figure 4.5). Currently, only about 50% of positions important for the O&M of rural water supply schemes, support and technical, are occupied. In addition, about 78% of the staff are newly hired and have a year or less experience in the sector. However, increasing numbers of workers have been hired over the past five fiscal years (Figure 4.5).

Figure 4.5: Human resources of the WWRDO, 1995-1999 EC



The WWRDO has no permanent office head fully engaged with and supervising the regular activities of the office. The appointment of the office head is not clearly defined as to whether it is based on political grounds or educational background. According to the office experts, the absence of a permanent office head has created a serious problem for day-to-day activities. The WWRDO head affirmed that he is engaged in additional work and has limited time to accomplish the activities of the office. Currently, the office head's main duties are as head of the Woreda tax administration. In addition, he has a political commitment to work as a service administrator in four kebeles, involved in identifying the different problems the people are facing and reporting these to the concerned bodies. With regard to staff, the head reported that most of the staff members are newly hired and lack crucial practical experience in the sector. According to the head, in addition to the workload he faces, the major problem impacting the regular activities of the office is this lack of practical experience to make decisions and perform duties.

According to Davis and Brikke (1995), drinking water is sustainable if facilities are maintained in a condition that ensures a reliable and adequate potable water supply. Therefore, how soon a system is maintained is a very important issue to ensure the continuous and sustainable use of water supply schemes. Except in Choroqo, where the scheme has not faced a major breakdown since its

construction, the users in all schemes have been complaining about the low speed of maintenance. The WATSANCos, excluding Bendo, First Ansha and Choroqo, said that maintenance for minor breakdowns (fittings, faucets, valves, batteries) takes place within 15 days, whereas maintenance for major breakdowns (pumps, motors, generators, switchboards, severe tanker leakages) might take from three months to more than a year. Choroqo scheme has not faced a major breakdown so far, as we have seen, but it has been nine and two years since First Ansha and Bendo schemes gave up service provision, respectively.

WWRDO experts said that the schemes found in Alaba are deep boreholes and motorised; therefore, they need machinery and well trained professionals to undertake major maintenance. They added that the WWRDO maintenance team does not have the capacity to undertake major scheme maintenances, so, the burden is placed on the regional BoWR. One of the office experts said that, when there is a major scheme breakdown, the office reports to BoWR, but that BoWR also has limited capacity to give a fast response to scheme breakdowns. Therefore, it takes a minimum of three months to sort out a major scheme breakdown. BoWR has only one functional crane to undertake maintenance in all rural Woredas in the region. According to the experts, even minor breakdowns take a week or more because of the office's lack of vehicles and running cost problems.

The experts added that some WATSANCos do not report breakdowns immediately to the office, which causes delays to O&M. During the field investigation, it was observed that the office has only three functional motorbikes to undertake maintenance and other activities throughout the 24 rural water supply schemes in the Woreda, with the furthest about 105km away, Yataoberho. The office experts reported that the office has no trained technician to undertake even minor maintenance: the office pays a per diem to technicians from private companies in Alaba town to perform maintenance. Generally, the time between breakdown and maintenance in major cases, as mentioned by WATSANCos and Woreda water experts, agrees with results obtained from the water source mapping of all schemes. According to the latter, it has been about four months since the last scheme stopped operating, with an average of 12 months to receive maintenance for all the schemes. In addition to the absence of the necessary human, financial and material resources at Woreda level, the slow response from the region contributes to the long time delays regarding scheme breakdowns.

4.1.2 Roles and responsibility of the different actors

The roles and responsibilities of the WATSANCos, according to the WWRDO chairperson and experts, include: reporting to the kebele chairman and the WWRDO when there is a scheme breakdown; controlling income and expenditure of the scheme; recruiting scheme guards, operators and tap attendants; and promoting hygiene and sanitation to the community. In the Water Action WATSANCos, trained VHCs promote hygiene and sanitation, and tap attendants and motor operators are recruited from among these, having received training on motor and generator operation, minor maintenance and revenue collection. However, no WATSANCo was found to have a formal written job description. In addition, there is no formal agreement with the WWRDO identifying the different roles and responsibilities. As a result, WATSANCos are not properly fulfilling their roles and responsibilities.

The major roles and responsibilities of the WWRDO, according to the WWRDO experts and office head, include: construction of new schemes; maintenance and rehabilitation of existing water supply

schemes; promotion of hygiene and sanitation; and follow-up on the quality of NGO waterworks construction.

In the memorandum of understanding (MoU) signed for the World Bank's rural WaSH programme (R-WASH) between the ministries of water resources, health and education, the WWRDO is responsible for the development, utilisation, protection, conservation and regulation of its own water resources, with about 12 major roles and responsibilities (MoWR, MoH and MoE, 2006). However, in the MoU, the task of sanitation and hygiene education has been given to the Woreda Health Office and Education Office. The role of the Woreda Health Office, according to the office head, includes: awareness creation about hygiene and sanitation in the community; and supporting the community to construct and use latrines. Including these, the Health Office has about 14 roles and responsibilities in the R-WaSH intervention modalities signed between the three sector offices. The Woreda Education Office has about 14 roles and responsibilities. The offices are to carry out their tasks both individually and in cooperation with each other. However, the three sector offices are mostly not performing the activities listed in the MoU properly. Owing to a lack of integration between the sector offices, duplication of effort has been observed.

Water Action performs the following major activities in the Woreda: construction of water supply schemes for domestic use; and promotion of hygiene and sanitation practices in the community through the deployment of trained VHCs. BoWR supports the WWRDO by providing material support, including motorbikes, helping with major breakdowns, providing training for staff, and giving technical support.

4.1.3 Linkages and accountability between actors

With regard to structural linkages with the WATSANCos, the WWRDO experts had different perspectives. Some said that there is a legal structure between the office and WATSANCos and the office has been providing technical support to WATSANCos, with the WATSANCos responsible to the office. Other experts argued that there is no legal structure, and this is manifested by the absence of a reporting system to the office. The second group said that the WATSANCos are responsible to the kebele leaders. Despite the absence of a common understanding among the experts, WATSANCos have not been reporting financial or other activities to the office. The WATSANCos report to the office only when a scheme breakdown occurs. All the WATSANCos affirmed that they do not report their activities to the office except in the case of breakdowns. Generally, there are no signed agreements between the WWRDO and the WATSANCos, and the latter have no action plan.

Management by communities only works effectively if legal arrangements are in place. Too often, legal backing for a water committee is missing, making these bodies ineffective. If they do not have a legal status, they can not open a bank account or enter into contractual arrangements. They can not do their work properly and this puts the sustainability of the system at stake (Bolt and Fonseca, 2001). In Alaba, no WATSANCos have legal status or are officially registered as an association at the Justice Office, although they have been recognised by the WWRDO, Kebele Administration and Woreda Administration.

The WATSANCos of most of the schemes did not know whether they had legal status or not and did not know whether this was important or not. The committees of two schemes said that legal status was not their priority: maintenance was instead the main focus. However, the Debeso

WATSANCo felt that legal status was very important. The scheme's secretary said that they had been asked for legal documents when asking for receipts. Members added that they had frequently asked the WWRDO to help with certification, but the latter did not cooperate. The WWRDO experts claimed that the request was beyond the office's capacity.

However strong the rules and regulations of an institution are, they may be meaningless if they are not backed by the force of law. An institution might be challenged by users and/or members if it does not have legal status. An officially registered water committee become a legal entity and has the right to charge and to access funding from a bank. A legal entity is bound by certain rules with regard to reporting and accounting, which make its performance more transparent. An additional advantage is that committee members are no longer personally liable for debts, contracts and other obligations. This increases people's willingness to become committee members (Bolt and Fonseca, 2001). The WWRDO experts reported that the Woreda Finance Office refuses to audit the schemes owing to the lack of legal status of the WATSANCos, and this lack of status is one factor contributing to financial mismanagement in most of the schemes.

In the WATSANCo Organisation Manual, nothing is said about accountability of the committees, although it says that they have to report to the user community and the WWRDO on income and expenditure and overall activities every three months (BoWR, 2002). When they were asked to whom they are accountable, the committees mentioned different bodies. Some said they were accountable to the WWRDO, and others said the Kebele Administration and the community. One WWRDO expert said that the committees said they were accountable to those with whom they had the strongest relationship.

The WWRDO community promoter said that he told the committees to report to the Kebele Administration when there was a management problem and to the WWRDO when there was a technical problem, so as to save per diem money, as committee members were travelling frequently to the WWRDO, even for minor problems. He added that he told the committees to report to the WWRDO if the Kebele Administration failed to solve the problem. In the majority of the schemes, the kebele chairperson said that the WATSANCos are accountable to the WWRDO, although some said they were accountable to the Kebele Administration. The WATSANCos organised by Water Action said that they were accountable to Water Action before the handover took place but now are accountable to the WWRDO. One WWRDO expert said that WATSANCos have no legal entity, so they lack the legal grounds to charge or to be charged in the case of scheme finance mismanagement. They also have not signed any agreements with the WWRDO or the community. Therefore, the WWRDO has been using local community conflict resolution mechanisms to return misused money or deal with any mismanagement.

Generally, in the Woreda, there are no clear rules and regulations addressing the accountability of the WATSANCos. No written rules and regulations are in place to facilitate decision making and regulate the user community and committee members, although the Organisational Manual states that setting up such rules is the responsibility of the water committee and the user community (BoWR, 2002). No WATSANCo has prepared a water constitution. According to WWRDO experts, lack of budget, human resources and logistics makes it impossible for the office to coordinate the committees and prepare such constitutions.

With regard to reporting on financial, material and overall activities, responses of the WATSANCos, the user community and the WWRDO were different. User communities in all the schemes said

they had never been told about the financial, physical and material status of the institutions. The WATSANCos of all the schemes except Choroqo, Ashoca and Upper Tuka said that they do not report to the community. The WATSANCos of Ashoca and Choroqo, however, said that they report to the community every month and every three months, respectively. When asked to show a report example, they said that they report orally. Key informants said that the WATSANCos never report to the community. The WATSANCo of Upper Tuka said that it reports to the community through the Kebele Administration, but the latter denied this. The WATSANCo of Lower Lenda said that it has nothing to report owing to the high operation cost of the scheme. The WATSANCo of Debeso said that it reported to the community every three months in the beginning but stopped when the community refused to honour its promise to pass on an incentive to committee members. The WATSANCo of Lower Arsho said that nobody had asked it to report to the community.

Furthermore, no WATSANCo has been reporting to the WWRDO according to the procedure written in the Organisational Manual (BoWR, 2002). The WWRDO experts said that the WATSANCos had been told to report to the office every three months on the financial status of the schemes. The committees reported to the office at the beginning, but this usually stopped when a scheme broke down and did not start again thereafter. The community promoter said that recurrent failure of schemes was the major factor affecting the reporting system. It is clear that there is no reporting system on finance or other activities, either to the community or to the WWRDO. As a result, the community has no information on the scheme's financial and material resources. In addition, it was observed that communities in the majority of the schemes are not participating and working together with the WATSANCos when there is a scheme breakdown. Moreover, owing to a lack of transparency within the WATSANCos, the latter do not dare ask the community to contribute when there is scheme breakdown or use the Kebele Administration as a tool to force the community to contribute.

4.1.4 Communication and coordination between the different stakeholders

All the WATSANCos reported that the WWRDO does not carry out regular follow-up and support supervision unless asked by the committees. According to the WWRDO experts, every year there is a plan to follow up on and supervise schemes and the performance of the WATSANCos, but achievement of this is below 10% because of financial, logistical and human resource constraints. During the field investigation, it was observed that the WWRDO has no checklists for follow-up and supervision, and no field reports of the professionals were seen in the office.

According to the Water Action manager, visits and supervision of the WATSANCos and the schemes took place between the provisional and final handover of the scheme to the community. The WWRDO experts confirmed this, and added that no efforts are made by other providers and BoWR to supervise or visit the schemes. The WATSANCos of schemes constructed by Water Action said that, after handover, nobody – including the WWRDO – had visited or provided support. WWRDO experts said that, despite Water Action's good start, it is constrained by limited human resources, logistics and budget.

In the Woreda and region, there is no standard for scheme handover after providers complete their water projects. The WWRDO experts said that, mostly, schemes are handed over to the community without the necessary training or spare parts/tools being provided to the WATSANCos. They added that only Water Action follows up on completed projects until the community is fully capacitated to

manage the schemes (when handover occurs). Despite the absence of a standard, the experts preferred that implementers capacitate the community through provision of trainings for committee members and technicians and of necessary spare parts and hand tools for minor maintenance.

> The WWRDO community promoter said: 'When Yataoberho scheme handover took place, between waterworks construction enterprise (contractor) and BoWR (client), the experts from the office could not get there on time owing to a vehicle problem. The two others could not wait until they arrived to take part in the ceremony. They gave the generator key to the kebele chairman, who knew nothing about generator operation. Finally, when the chairman tried to operate the generator through trial and error, he made the electrical system fail.'

The MoU mentioned in Section 4.1.2 outlines clearly the roles and responsibilities of the different sector offices at Woreda (health, education and water), and this signed agreement was found at each the WWRDO. Despite this, no integration of the three sector offices has occurred, owing to a lack of awareness of the signed MoU and commitment from the sector offices. The visual leadership and coordination model (Annex 3) prepared by the different sector offices during stakeholder and role analysis affirmed the absence of integration among the three sector offices. Moreover, nothing has been said about the integration of the three sector offices in the respective strategic and annual plans. WWRDO experts said that, at office level, efforts were very poor, but at the level of the professionals, there was the initiative to work with stakeholders, especially with Water Action. All sector offices believed that it is important to integrate the different stakeholders to use limited resources to support the WATSANCos and avoid duplication; however, carrying this out is beyond their capacity. The head of the Woreda Health Office said that stakeholders make a coordinated effort only when there are emergencies. He added that, in the previous year, when acute waterborne diarrhoea broke out, the problem was handled through the coordinated efforts of the relevant sector offices and NGOs. The offices reported lack of experience, commitment and engagement as the major reasons for the absence of coordinated efforts among stakeholders. According to the Woreda Administration, lack of systematic communication and experience and little attention paid to integration are the most important constraints to integration.

It was observed that Water Action has a different perspective and position regarding the importance of working with other actors in the sector. According to the programme manager, the NGO has established a steering committee at Woreda level as a platform for the different stakeholders to discuss water supply and sanitation every quarter. During meetings, the organisation's previous quarterly accomplishment report is evaluated and the upcoming three-month plan is assessed and approved. He added that, despite the NGO's efforts, there is no active participation from the sector offices in the steering committee. According to the programme manager, the organisation has no problem in integrating its activities with community-based organisations (CBOs), because it has been working effectively with them for the past seven years. The problem lies in integrating activities with those of other actors working in the sector, because actors are concerned about daily tasks rather than collective long-term results. He added that sector offices have the chance to know about the plans and strategies of Water Action from the steering committee meetings, but Water Action has no chance to know what is planned by the sector offices. Therefore, sector offices, particularly the WWRDO, should take the initiative to integrate the activities of the different actors. The chairperson of the WWRDO office said that it is very difficult for the office to bring other sector offices and relevant stakeholders together because of a lack of experience and engagement of sector

offices in their own daily activities. He added that integrating activities and stakeholders should be led by another influential office or the Woreda Administration.

4.1.5 Information management

Owing to the absence of a centralised information and documentation system in the WWRDO, it was difficult to obtain important information on most of the schemes and on office activities. During the field investigation, poor documentation of activities was observed at both community and higher levels. At the WATSANCo level, there is no list of users of water and no documentation of what has been done. In the WATSANCos and the WWRDO, there is no formal system of O&M reporting. During the field observation, in the WWRDO, for almost all the schemes the research team could not find important documents such as well completion reports and feasibility study documents. According to the WWRDO experts, the absence of a clearly defined, permanent and committed head of the office and the absence of a proper scheme handover strategy have led to a situation of poor documentation. The absence of such documents could affect activities in the future and also lead to additional costs if activities are unnecessarily repeated. For example, in a well completion report are pumping test results, carried out during drilling; this test would have to be carried out again in the absence of the report. In schemes constructed by Water Action, the team found well completion reports and feasibility study documents.

The WWRDO has only one computer, donated by UNDP. The office has no internet access and communication with WATSANCos occurs mainly when there is a scheme breakdown. The WATSANCos have no telephone access and mostly travel long distances, either on foot or by cart, to report to the WWRDO when there are breakdowns or other problems associated with the scheme.

The Water Action programme manager said that the absence of detailed and centralised information about previous financial and physical resources has affected the normal functioning of the NGO. This has made it difficult to learn about the past activities of the organisation. This weak performance on documentation meant that the research team could not obtain the annual financial spending report and the amount of money spent on the construction of each scheme installed by Water Action. According to the NGO, this absence of documentation is a result of high turnover of individuals assigned to management positions since the organisation's establishment. The programme manager reported that previous managers did not properly write down and document scheme information and budget planning breakdowns, etc.

4.2 Financial factors

4.2.1 Tariffs and tariff setting

Financial aspects are very important as far as O&M are concerned. During the field investigation, it was observed that the cost of a 25-litre jerry can of water varied from scheme to scheme. At Choroqo, Ashoca, Lower Lenda, Lower Arsho and Debeso, costs were 10, 15, 20, 20 and 15 cents, respectively. Most of the users in all schemes, except Choroqo and Upper Tuka, where the cost of 25 litres and 50 litres is 10 and 25 cents, respectively, said that that cost is too high to afford for everyday activities. Despite this claim, people were observed using the source owing to the absence

of a nearby alternative, especially during the dry season. Users at Lower Lenda said that they spend a great deal of money fetching water from Alaba town owing to the scheme's breakdown. Owing to its relatively low cost, people from other areas, like Hamata, where the cost of water is high, were observed travelling a long distance to fetch water from Choroqo scheme. Most of the users at Lower Arsho claimed that the tariff is too expensive to afford and they proposed a reduction in cost. They added that it is better to use unprotected springs for free than pay this much for one jerry can of water, which they can not afford because they are farmers and do not have another source of income. In this area, people were observed fetching water from nearby springs for household activities (Figure 4.6).

Figure 4.6: People fetching water from unprotected springs, Lower Arsho

According the WATSANCos of Lower Lenda and Lower Arsho, the high cost of water owes to the high cost of O&M of the schemes. The chairperson of Lower Arsho said that the tariff for a 25-litre jerry can was 10 cents at the beginning, but this was increased to 20 cents owing to the high operational cost of the scheme. The WATSANCo of Lower Lenda said that the tariff was amended from 15 cents to 20 cents for the same reason.

In the Woreda, 83.3% of the schemes were found to have a water meter, which is very important for knowing the amount of water sold to users. Despite the presence of meters, the WATSANCos of Debeso and Upper Tuka were observed collecting a revenue from the tap attendant as per the amount of water in the tanker rather than the reading on the water meter. The WATSANCo of Debeso said that the committee does this to avoid discrepancies between the amount of water sold and the reading on the meter. The chairperson of Upper Tuka said that the money is collected in this way owing to the failure of the water meter to read the amount of water sold. However, during the field visit the tanker was observed to be leaking severely to an extent that could affect water service delivery (Figure 4.7). In addition to training tap attendants on revenue collection, there should be regular follow-up and supervision by the WWRDO to check on the performance of water meters and to check whether WATSANCos are selling the water based on the reading on the water meter.

Figure 4.7: Cattle drinking water below the severely leaking tanker

4.2.2 Financial management systems

According to users, except at Ashoca scheme, no community participation occurred when the tariff was set. Users at Ashoca said that they had participated in tariff setting. They added that the tariff setting had been organised by the implementing organisation, Water Action, together with the WATSANCo and the Kebele Administration. Users at Lower Arsho said that they had no information about the body responsible for tariff setting. Users at Choroqo scheme said that only male members of the community took part in tariff setting. Users in the other schemes said that the WATSANCo and the Kebele Administration set up the water tariff.

In the schemes constructed by Water Action, the tariff is set by the implementer together with the community and the Kebele Administration. The implementing organisation, after fixing a reasonable cost and considering the O&M, consults the community about the tariff to be implemented. Generally, in other schemes, only the WATSANCo and the WWRDO were found to have set tariffs, without consultation with the community. Management committees in all the schemes and the WWRDO said that O&M is the main factor taken into consideration when setting water charges. In no schemes does tariff setting take into consideration poor and marginalised people.

4.2.3 Financial management system

Financial management and transparency are among the more problematic aspects of community management. Continuing transparency on income and expenditure, bookkeeping and accounting are essential (Bolt and Fonseca, 2001).

During the field investigation, only four WATSANCos were found to have a financial manual, which they received while they were attending trainings. However, none of them use the manual for day-to-day activities. The chairperson of Lower Arsho said that members are not clear how to follow and use the manual. He added that the bookkeeper, who knew more about the manual, had left the committee for personal reasons. None of the committees had legal revenue collection receipts. However, schemes like Choroqo, Ashoca, Debeso and Upper Tuka sometimes use ordinary receipts from shops for revenue collection. The WATSANCos of Upper Tuka and Debeso said that they sometimes use the stamp of the WWRDO; in Choroqo, the Kebele Administration stamp has been used. Generally, no WATSANCos had legal documents like receipts and payrolls for their expenses.

Most were observed to be using blank paper or ordinary receipts. During the field visit, only one scheme –Choroqo – was observed to have a relatively good bookkeeping system and well organised financial documents showing income and expenditure. Ashoca had financial documents showing mainly the income of the scheme.

Only the WATSANCos of Choroqo and Lower Lenda said they have a trained bookkeeper. The chairman of Lower Lenda said that, owing to the recurrent failure of the scheme, the bookkeeper could not work seriously. Generally, schemes constructed by Water Action have well furnished committee offices with relatively good financial management systems. All the other schemes, except Debeso (using the power house as an office), have no office and their financial management is very poor. They also have no financial documents showing transactions and balance. In addition, no WATSANCos have financial report documents that have been used for reporting, either to the community or to other concerned bodies, indicating the absence of transparency in the committees. In order to solve the above problems, a uniform financial management system should be developed and adopted in all the schemes. In addition, there should be regular follow-up and provision of trainings to the committees to ensure implementation is efficient.

The WATSANCo Organisational Manual says the committee should collect revenue every day from the tap attendant through the cashier and save the money collected, leaving not more than 500 Birr as petty cash in the hands of the cashier (BoWR, 2002). However, no scheme was observed to be applying this rule. All the committees collect money from the tap attendants at different times and some save this in the bank and others keep it themselves. The WATSANCo of Choroqo scheme said that money is collected from the tap attendants every 15 days and, if there is more than 500 Birr, the cashier deposits this in the bank. The WATSANCo of Debeso said that the money is collected from the tap attendants every week through the cashier and deposited in the bank. The chairperson added that, owing to the committee's effective scheduling system, the WWRDO has taken it as a model and informed all committees to adopt such system. The WWRDO confirmed that this committee has an effective saving system. Debeso, Choroqo, Ashoca and Upper Tuka were found to have bank accounts, holding 67,000, 21,000, 9,000 and 2,100 Birr, respectively. The WATSANCos of Lower Lenda and Lower Arsho said that they can not save money in the bank owing to the high operation cost of the schemes.

According to WWRDO experts, the high savings of Debeso scheme owe to the presence of some strong and committed members in the institution. The chairperson of Debeso scheme said that they were recording income and expenditure of the scheme at the beginning but stopped doing so owing to the refusal of the community to provide incentives to the committee members. The chairman of Bendo said that he receives the money from the tap attendants without any receipt and keeps hold of the money him self.

According to the WWRDO experts, all WATSANCos in the Woreda have problems in reporting financial and physical activities to the office and to the community. The committees also have serious problems in financial management and saving. The office experts added that, of all the WATSANCos in the Woreda, the WATSANCo at Debeso is relatively good as it has saved more than 60,000 Birr within five years; this committee also meets regularly with the WWRDO for technical support. The WWRDO added that the scheme was misused for 28 years before the current committee members were elected.

WWRDO experts pointed out that, of the recently constructed schemes, WATSANCos established by Water Action could be taken as a very good model, owing to their good financial management. Some of these schemes have been able to save more than 15,000 birr in three years. During the field investigation, the research team confirmed the presence of good financial management systems in the schemes constructed by Water Action. According to WWRDO experts, major reasons behind mismanagement of scheme financial resources include: lack of follow-up from the WWRDO and the community; absence of legal status; lack of a sense of ownership among the WATSANCos; and lack of sufficient training on financial management.

According to the BoWR strategic plan, full cost recovery of O&M costs are required to ensure the sustainability of rural water supply schemes (BoWR, 2007). Owing to the absence of properly handled and documented financial reports, it was difficult to view the financial flow of most of the institutions. During the field investigation, however, WATSANCos established by Water Action were found to have relatively good bookkeeping and financial documents, showing scheme income and expenditure. Of the two observed schemes, Choroqo and Ashoca, the financial documents of Choroqo show the best bookkeeping trend, comparing the monthly income and expenditure of the scheme.

The average monthly income of the scheme has been showing a steady increase, from 1,055 Birr in 1997 EC to 1,136 birr in 1998 EC, then 1,615 birr in 1999 EC. According to the WATSANCo, this owes to the increase in the number of users as a result of the low cost of water relative to other schemes. Expenditure has also shown an increase, from 342 Birr in 1997 EC to 803 Birr in 1998 EC, then 1,018 in 1999 EC. This owes to an increase in demand for and price of fuel. However, average monthly income of the scheme is greater than expenditure, in all observed years. The WATSANCo has been fully covering operation and minor maintenances of the scheme from its revenue.

Table 4.2: Monthly income and expenditure of Choroqo scheme, 1997-1999 EC

	1997 EC		1998 EC		1999 EC	
Month	Income	Expenditure	Income	Expenditure	Income	Expenditure
September	1,107	200	673	220	1,331	1,433
October	1,011	200	915	1,424	1,195	1,187
November	580	0	677	337	1,532	100
December	773	649	867	482	1,053	550
January	1,956	1,064	978	961	2,082	1,476
February	1,835	490	1,763	1,497	2,404	493
March	1,243	0	1,372	220	1,644	1,140
April	1,118	220	1,218	450	1,776	950
May	921	220	1,566	1,263	1,607	1,678
June	236	120	1,398	354	1,330	562
July	1,182	276	1,127	895	2,671	2,009
August	697	665	1,077	1,534	753	635
Total	12,659	4,104	13,631	9,637	19,378	12,213

WATSANCos of Debeso and Ashoca also confirmed that their monthly income was higher than expenditure. In other schemes, except First Ansha and Bendo, the committees said that the monthly

income is less than expenditure owing to the schemes' high operational cost. However, according to the WWRDO experts and users, the lower monthly income of these schemes owes mainly to mismanagement of scheme finance by the WATSANCos.

The average monthly recurrent expenditure of Choroqo scheme is estimated to be 1,418 Birr. The major expenditures include:

- Salary for tap attendants ,scheme guards and operators (440 Birr);
- Fuel, oil and grease (874 Birr);
- Per diem and transportation (40 Birr);
- Minor maintenance and spare parts (42 Birr); and
- Expendable materials (22 Birr).

Generally, according to the financial reports and information obtained from WATSANCos, with an outstanding deposit, the revenue collected can cover even the cost of major maintenance.

WATSANCos of all schemes said that there is no serious audit of their financial and material resources. In the WATSANCo Organisational Manual, it is clearly written that the WATSANCo has to cooperate with experts from the WWRDO who come to audit and monitor the financial and physical resources of the committees (BoWR, 2002).

The WATSANCo of Choroqo said that the implementing organisation, Water Action, audited and monitored the financial flow of the committee every month before the scheme was handed over to the community. They added that the scheme has not been audited since. In schemes constructed by other implementers, auditing and monitoring are very weak or almost absent. The WATSANCo of the oldest scheme, with more than 33 years of service (Debeso), said that the institution has been audited only three times since the newly elected committee came to power in 1994 EC. The secretary of the committee added that only two of the audit results were reported to the committee; results of the last audit had not been disclosed. The secretary also said that office experts might come every six months or every year or not at all. He added that, depending on the results of the audit, there should be a prize or punishment for committees; otherwise, those who work hard are discouraged and those who have been involved in unlawful activities are encouraged. One WATSANCo member at Lower Arsho said that auditing is not regular and continuous and people who mismanage the institution's resources are not punished. He added that the weakness of the system might encourage people to enter into the system and misuse the institution's resource.

Generally, no regular auditing by the WWRDO has taken place. The WWRDO community promoter said that the lack of consistency and, in some cases, absence of auditing owes to a lack of the human, financial and logistical resources to undertake such activities. Absence of commitment among existing experts and the permanent office head to supervise the different activities being undertaken in the office also contributes to the absence of audits and monitoring of WATSANCo financial and material resources.

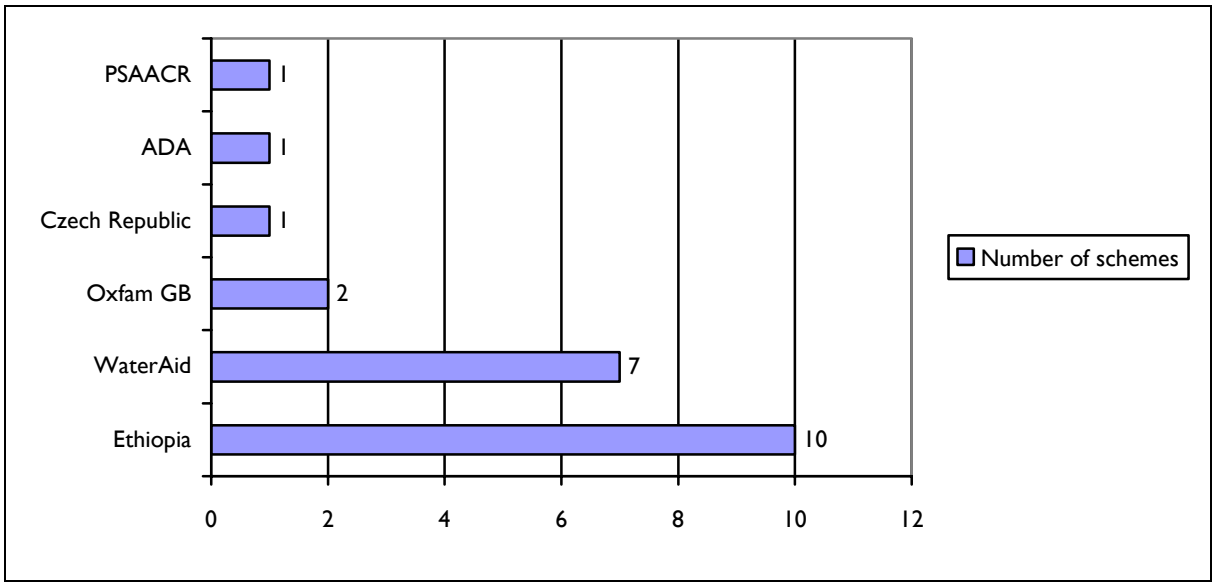
4.2.4 Cost sharing: Who pays for what component?

Owing to the deep water table of the area, all the schemes constructed in the Woreda are deep boreholes. Although the water is free from microbes and safe for drinking, the investment cost to

construct one deep borehole was found to be very high compared with other technologies in other places, such as hand pumps and protected springs. In addition to the deep groundwater table, the presence of excess fluoride incurs additional costs (construction of treatment plants). Owing to the absence of proper documentation on previous activities, it was difficult to obtain the investment cost for each scheme constructed by Water Action. However, according to information obtained for five schemes constructed in the Woreda (Annex 2), investment costs ranged from 640,000 to 1,060,000 Birr. These high investment costs could have been used for the construction of many hand pumps and the development of a number of protected springs. The WWRDO head said that Alaba is known for its deep groundwater table; sources are not easily available and accessible and this means very high investment costs. This environmental factor means the majority of the community suffers from a shortage of improved water.

The investment costs of the schemes constructed in the Woreda were covered mainly by the government, international donors and ADA (Figure 4.8). Most were financed by the government (10) and Water Aid (seven), and the remaining ones were financed by Oxfam GB (two), the government of the Czech Republic (one), PSAASCR (one) and ADA (one). Community participation took place during the construction of the nine Water Action schemes. Community contributions were made in terms of cash, labour and locally available materials.

Figure 4.8: Financers of schemes installed in the Woreda



The users at Ashoca and Choroqo, constructed by Water Action, said that, during project implementation, they participated in terms of labour, provision of locally available materials and direct contributions of money. The contributions in labour were: digging trenches for pipe line distribution; water point and source fencing; procurement of construction materials like stones and sands; and clearing access roads. According to users, contributions in cash ranged from 30 Birr (Water Action projects) to 40 Birr (Bendo). WWRDO experts, however, reported that, in Bendo, despite the community being asked to contribute 40 Birr per household, it was difficult to collect the requested money owing to various problems.

For schemes constructed by Water Action, WATSANCo selection was also a component of participation during the project period. Cash represents only one part of the village contribution. The Water Action program manager affirmed that the community participated during project activities by contributing cash, labour, locally available materials and land for construction. He added that the schemes were fully managed without salary by the WATSANCos selected by the community after project completion, and this could also be considered community participation. According to users, the driving forces behind their active participation were: the need to solve water problems faced in their locality; the need for improved water as a remedial measure for waterborne diseases; and the need to reduce distances.

In schemes constructed by other implementers, there was no/little community participation in all phases of the water resource development project. Users at Bendo and First Ansha were involved only during the construction of the scheme, through labour contributions; in other schemes, users did not participate in any stages of the project development. According to users in the latter cases, lack of community participation during project activities was a result of the approaches followed by the water providers.

WWRDO experts reported that willingness of the communities to participate in terms of labour and supply of local materials was very high, but there was some resistance to contributing cash as a result of financial constraints. According to the experts, the main reasons for poor community participation were: economic constraints; lack of awareness in the community owing to the absence of sensitisation by implementers; and lack of commitment from kebele leaders and professionals to mobilise the community. In order to cover the huge investment costs, increase water supply coverage and create a sense of ownership among communities, it is vital to have community contributions during construction of new schemes.

The WATSANCos in all schemes said that the major source of income of the institutions is water revenue. The WATSANCos of Ashoca, Choroqo, Debeso and Upper Tuka said that income from this source is used for operation and minor maintenance. The programme manger of Water Action affirmed that the operation and minor maintenance costs were covered by the WATSANCos and the cost of major maintenance was covered by Water Action until the schemes were handed over to the community; after handover, the WWRDO was responsible for all activities. However, according to the programme manager, even after the scheme was handed over, the WATSANCos frequently came to the organisation for support, owing to a lack of response from the WWRDO.

The WATSANCos of Lower Arsho, Lower Lenda and Bendo said that operational costs are very high compared to income; therefore, revenue collected is not enough to cover maintenance costs. They added that the revenue collected is not enough to undertake even minor maintenance. The chairperson of Lower Lenda said that, owing to the recurrent failure and high operational cost of the scheme, the institution has not made any payment to the tap attendants, pump operator and scheme guard since the construction of the scheme. The WATSANCos of Lower Arsho and Bendo said that they have been collecting money from the community and the kebele Council to cover the cost of minor maintenance. Generally, in schemes constructed by other implementers, the cost of minor maintenance is covered by the WATSANCos and the WWRDO and the cost of major maintenance is covered by BoWR. The WWRDO supports all the WATSANCos by providing technicians and spare parts to those schemes which do not have the capacity to buy spare parts. The office provides support only if it can obtain financial or material support from donors.

With regard to spare parts for minor maintenance, the committees, except Lower Arsho, Lower Lenda and Bendo, said that water-selling revenue is used to cover the cost. The WATSANCos of the above three schemes said that the operational cost is greater than the income so they can not cover the cost of spare parts. They added that the institutions ask for the support of the WWRDO when they face spare parts shortage. The WWRDO affirmed that it covers the cost or provides spare parts for minor maintenance for those schemes that do not have the capacity to do this. Support is only given if the WWRDO can obtain support from donors.

4.3 Technical factors

4.3.1 Technology choice

Owing to the deep groundwater table (the depth of each scheme is indicated in Annex 2), all the schemes constructed in the Woreda are motorised. Different organisations have installed different pump types. There are six schemes installed with mono-lift pumps and 18 with submersible pumps. In addition, generators of different brands have been installed by different implementers. Of these, 25% are Lister Peter (TR3), 33.3% are Deutz, 8.3% are Daewoo, 4.1% are Lombardini, 4.1% are Marellimotori and 4.1% are Igeal. In addition, 8.3% of the schemes use direct electric sources. It was difficult to find out the brand of the remaining 12.5% of generators, owing to the disappearance of the specification on the generators and absence of documented information of the generators in the WWRDO.

According to the Water Action programme manager, the organisation installed technologies recommended by the organisation's professionals as suitable to the area. He added that the organisation did this owing to the absence of a standard for technology selection in the Woreda. The WWRDO experts affirmed that there was no scheme technology standard set by the region or the country that it knew of. Despite the technological strategies of the UAP underlining the importance of standardisation of pumps and generators in relation to VLOM (MoWR, 2006), nothing has been done so far to put this into practice on the ground. As a result, different implementers have installed schemes with different pumps and generator brands.

Users in all schemes reported the absence of community participation during technology selection and project design. In addition, in the feasibility study document of schemes constructed by Water Action and PINF, nothing is said about community participation during the different stages of the projects. In the Water Action programme document, community participation is addressed for the different stages of the water resource development, except in design and technology selection. The absence of community participation during design and technology selection, according to the Water Action programme manager, owed to the sophisticated nature of the technology being implemented in the Woreda.

> The operator of Ashoca scheme said: 'Even when the scheme works, it requires the force of around 15 strong men to start up the motor and rotate the pump. And when the motor starts functioning, it sets on fire.' Hence, in addition to the recurrent failure of the scheme, looking for these numbers of individuals to start the motor and dealing with the spark when it sets on fire are other challenges He added that he would prefer the scheme to have a pump that can be started up using a key rather than a manual pump that requires such numbers of people. The operator in Alem Tena, where the pump is mono-lift said: 'I don't think it is a motor prepared to run a pump, rather it might be a motor for a mill.'

With regard to technology preference, in all schemes where mono-lift pumps were installed, WATSANCos complained about the motor used to run the pumps, saying it needed a great amount of force after being in place for some time.

The WWDO experts affirmed that schemes with mono-lift pumps fail more recurrently than those with submersible pumps, for unknown reasons. They added that the motor of a mono-lift pump needs the power of more people to start it up, in some cases up to 15 people are needed to pull the belt and start up the motor. The generators of submersible and mono-lift pumps are shown in Figure 4.9 below.

Environmental factors mean that it is difficult to provide a choice of different scheme technologies, like hand pumps, shallow wells, etc. However, it is still possible to have technology that is effective and able to provide an efficient service to the community. In the Woreda, except for design and construction problems, submersible pumps were found to be more effective than mono-lift pumps. Generally, for the sake of spare parts provision and maintenance, it is good to have a standard for the pumps and generators in the Woreda.

Figure 4.9: Generators of submersible (First Meqala) and mono (Choroqo) pumps

4.3.2 Spare parts

In the Woreda, there is only one ordinary building materials shop in Alaba town where the WATSANCos can obtain spare parts for minor maintenance, such as fittings of small diameters, faucets, gate valves and water meters. According to the WATSANCos, there are no specialised private local suppliers. They added that the cost of spare parts for minor maintenance is reasonable. The chairperson of Debeso scheme said that, if the shop does not have the required spare in stock, the committee usually orders it in. In most of the schemes, the WATSANCos reported that faucets, gate valves, water meters, air filters and oil cleaners are the most important spare parts that fail recurrently. The WATSANCos of Lower Arsho, Lower Lenda and Bendo reported that the generator batteries also fail recurrently. According to the WATSANCo of Lower Lenda, the recurrent breakdown of the battery owes to the failure of the generator to recharge the battery.

The WATSANCos, excluding Lower Arsho, Lower Lenda and Bendo, said that water-selling revenue is used to cover the cost of spare parts for minor maintenance. The WATSANCos of the three schemes claimed that they are unable to cover the cost of spare parts owing to their higher

operational costs. According to the WATSANCos, even if they can afford these, they can not get a battery in Alaba town and are expected to travel to Shashamene or Awassa to buy one.

The WATSANCos of Ashoca and Choroqo said that it is difficult to get some important spare parts from Alaba, Awassa and Shashamene, even for minor repairs, owing to the absence of a supplier with parts for schemes with mono-lift pumps. Therefore, the WATSANCos get the spare parts from Addis Ababa through Water Action, which installed the schemes. The WWRDO provides spare parts if it has them in stock.

The WATSANCo of Ashoca said that the motor and the pump of the scheme also fail recurrently and are not locally available. According to the WATSANCo, even if the spares were available, the WATSANCo would not have the capacity to cover the cost. They added that the price of spare parts for minor maintenance is increasing from day to day. The WWRDO experts affirmed that most of the spare parts for minor maintenance are available locally at a cost a little bit higher than in nearby towns. However, spare parts for major repairs are not available locally and sometimes it is difficult to find them in the regional town and they are very expensive. The experts added that the WWRDO does not have the capacity to cover the cost of major breakdowns and the main source of spare parts for major maintenance is BoWR.

5 Conclusions and recommendations

5.1 Conclusions

In general, the findings on sustainability and service levels in Alaba reflect a critical situation. The Woreda is entirely served by deep boreholes (24) with distribution networks to water points (65). Out of 76 kebeles in the Woreda, only 24 were found to have improved water. However, 42% of the schemes and 62% of the water points are not providing a service to the community. Most of the rural kebeles are therefore currently dependent on the operational 58% and 38% of the schemes and water points, respectively. Unless the non-functional schemes are restored immediately, the high pressure on the remaining schemes could lead to the breakdown of these schemes, especially during the dry season.

In the Woreda, there is a high frequency of scheme and water point breakdown, which has severely affected water service deliver. During the survey, as noted, about 42% of the schemes and 62% of the water points were non-functional. Pump failure, generator problems and pump head problems were the major reasons for schemes' non-functionality; scheme breakdowns and technical problems were the major causes of the non-functionality of water points.

When scheme breakdowns occur, the speed of maintenance is slow. Maintenance on minor breakdowns is performed within two weeks, whereas major breakdowns take a minimum of three months, at an average of 12 months. Despite repeated attempts to bring it into operation, one scheme has been unrepaired for nine years.

The WWRDO has never carried out water quality testing or regular monitoring of the sources and water points. According to physiochemical tests conducted by BoWR at selected schemes and water points, the bacteriological quality of the groundwater is good and safe for drinking purposes, but a high coliform count has been detected at water points. Although this coliform level is higher than that recommended by the WHO and BoWR, no effort has been made to disinfect the water. In addition, there is a serious fluoride problem in the Woreda, with the maximum level at 13.1mg/l at Bendo scheme. Most of the schemes have a fluoride level higher than that set by BoWR (3 mg/l). Only two schemes have a fluoride treatment plant.

The water points provide a service for five to 12 hours per day (an average of eight hours). Water points often start providing a service when queues begin. In most of the schemes with more than one water point, points are not placed at a reasonable distance to serve the majority of the community. The time spent to collect water is also high. The average roundtrip, including waiting, was found to be nine hours and five hours during the dry and wet seasons, respectively. The burden of searching for water is borne entirely by women and girls. During the wet season, those residing far from the improved sources use unprotected sources like ponds, rivers and unprotected springs for all domestic purposes, including for drinking. In most of the schemes, cattle watering also takes place at the water points during the dry season.

In general, the schemes do not provide enough water to meet the UAP. Per capita water consumption in the Woreda is at only 10 litres, 10 litres less than the 20 litres recommended by the WHO as a minimum requirement for respecting the human right to water and minimum hygiene

standards. It is also lower than the 15 litre standard set in the UAP – access to 15 litres of water per capita within a 1.5km radius.

A number of factors have contributed to poor sustainability and service levels of the schemes in the Woreda. The major factors are summarised as follows.

In most of the schemes, the community participated in the WATSANCo elections. Except for in the WATSANCos established by Water Action, where there are higher numbers of female members and decision making is carried out by female members, women are highly marginalised owing to the cultural influence of male members over females. During the WATSANCo elections, no consideration was made of incorporating different socioeconomic groups into the committee. In addition, there is no term and duration of membership unless an individual acts unlawfully. Most of the WATSANCo members reported feeling discouraged owing to the absence of incentives in return for their efforts to serve the community. Most importantly, there is no systematic follow-up and supervision by the WWRDO to evaluate whether or not the committee is functioning effectively.

Most WATSANCo members, tap attendants and operators reported feeling that they have not received enough theoretical and practical training to undertake their work effectively and efficiently. In addition the WATSANCos do not have trained technicians or the necessary spare parts and hand tools to undertake even minor maintenance. The WWRDO is also chronically under-resourced in terms of human, financial and logistical resources to undertake its regular activities. The office receives a budget only for office administration costs. Recent hiring is improving the human resources situation but the reality remains that, without vehicles, computers and the necessary finance and other logistical support, the WWRDO can not undertake its activities.

There is no formal agreement between the WWRDO and the WATSANCos identifying different roles and responsibilities. The WATSANCos currently have no legal status. The role of the WWRDO itself is not always clear when taken together with that of the regional BoWR. In general, this lack of clarity, oversight and management of different actors in the service delivery chain underlies many of the problems of unsustainability.

There is no clear understanding among users, WATSANCos and the WWRDO regarding to whom the WATSANCos are accountable. No committee has been reporting on its income or on other activities, either to the community or to the WWRDO, indicating a lack of transparency in the institutions. There is no regular audit of the institutions' financial and physical resources by the WWRDO or other bodies. Most of the WATSANCos have very poor financial management systems and no financial documents where income and expenditure are regularly recorded. About half of the WATSANCos visited have a bank account opened with the help of the WWRDO. Generally, the WATSANCos established by Water Action were found to have better financial management systems and trained accountants as compared with other schemes.

Communication between the WATSANCos and the WWRDO is ad hoc, mainly on the basis of requests from the WATSANCos for support when scheme breakdowns occur. Despite WWRDO plans every year to follow up on and supervise the WATSANCos, there are very few achievements on this owing to financial, logistical and human resource constraints. In the Woreda, there is no standard approach for handover of NGO schemes, leading to a lack of clarity with regard to responsibility for follow-up.

Despite the MoU signed between the ministries of water resources, education and health on the implementation modality for integrated WaSH programmes, the three sector offices do not coordinate actively at the Woreda level. Moreover, no integration has occurred among the different stakeholders working in the R-WaSH sector in the Woreda. The major constraints impacting coordination among stakeholders are lack of commitment from stakeholders and devotion to other routine activities.

Information management is very weak for all stakeholders. The problems found in the WATSANCos also exist at the WWRDO and Water Action levels. There is no documentation of what has been done and no systematic record keeping. There is no formal system of O&M reporting. Information technology is almost non-existent, as is the capacity to use it.

Generally, in those schemes that have good financial management and strong committees, monthly income is greater than expenditure. The best schemes show adequate income to cover even major maintenance. This offers a clear opportunity. However, in most schemes, tariff setting does not involve the community and does not take into consideration poor and marginalised people. Poor management means that no scheme has been carrying out saving systematically.

The investment costs of the schemes installed in the Woreda are very high; most were covered by the government and donors. However, in schemes constructed by Water Action, part of the cost was covered by the community. The cost of minor maintenance is covered by the WATSANCos that are strong in finance and by the WWRDO. The cost of major maintenance is covered by BoWR (and by Water Action before handover to the community). The price of spare parts is covered either by the WWRDO or the WATSANCos, depending on the financial strength of the committee. The WWRDO provides support only if it can get spare parts using the financial support of donors. There is no system of revolving funds in the Woreda to cover the price of spare parts or to pay for other activities.

In the Woreda, there is no specialised spare parts supplying shop and the WATSANCos buy spare parts for minor maintenance from an ordinary building material shop in Alaba town or travel a longer distance to Awassa or Shashamene.

The WWRDO does not have or enforce a standard for technology selection and in none of the schemes constructed in the Woreda has the community participated in technology selection. As a result, different organisations have installed their own preferred technology.

5.2 Recommendations

The following recommendations have been drawn from observation and from suggestions from users, WATSANCos and other concerned bodies, in order to ensure sustainability and increase service level of the water supply schemes.

- Rehabilitation and maintenance of non-functional schemes; replacement of schemes that are beyond their design period and are not currently providing a service; construction of new schemes in areas where there is high demand for improved water and increasing the number of water points in schemes where there is high water demand but limited numbers of water points; and construction of water points at a reasonable distance to serve the majority of the users.

- Implementation of integrated watershed management activities to conserve and enhance the groundwater resource and creation of awareness in the community on the nature of the groundwater resource and the importance of source conservation, enhancement and protection.
- Introduction of affordable and simple fluoride treatment plants at scheme level and disinfection of the water in reservoirs before it reaches users.
- Involvement of the community throughout project development phases to create a sense of ownership.
- Legalisation of the WATSANCos to solve prevailing management problems, including those surrounding accountability, transparency, reporting, auditing etc.
- Strict follow-up and supervision during the design and implementation of newly constructed schemes to avoid leading to recurrent scheme failure.
- Capacitating of the WATSANCos through the provision of trainings and maintenance kits.
- Regular follow-up and supervision of the WATSANCos and schemes to prevent mismanagement and to check on scheme status.
- Capacity building of the WWRDO, through the provision of logistics, maintenance kits, sufficient budget and human resources, and assignation of an office head who is fully engaged and performs only this job.
- Capacitating of the rural water supply maintenance team of BoWR, through the provision of logistics and human resources, in order to be able to provide an immediate response to major scheme breakdowns.
- Promotion of the private sector to open a spare parts shop in Alaba town to solve problems related to cost and scarcity of spare parts.
- Standardisation of technology (pumps, generators, etc) used in the Woreda, depending on the reality on the ground, and provision of trainings and spare parts accordingly.
- Creation of coordination and means of communication among stakeholders in order to avoid duplication of effort and to fill in the gaps in the sector
- Establishment of scheme handover and design standards, depending on the reality of the Woreda.
- Establishment of a good information management system, both at the community level (WATSANCos) and at the Woreda level (WWRDO and NGOs).

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Annex 1: Checklists and questionnaires

Community-level FGD

Water Use and Accessibility
1. What is your main source of water supply? • Is the water point functional? • For how low long has it been in operation? • For how long is the water point open every day? • How much is the volume of water a household is allowed to take? Do you have a restriction on water use? • What can you say about the quality and quantity of the water from this source? • Is the water sufficient for your daily activities? • What is the condition of water from the water points? (during dry season and wet season; presence of queuing up) • Where do you get water from when the scheme fails to work and there is a shortage of tap water? Does everyone have access to the water point?
2. How far is the main source from your residence? (in time and distance) • How much time do you spend collecting water per day? (time spent at water point + time to travel – roundtrip) • How many times do you fetch water per day? • What means of transportation do you use to transport the water? • Which members of the family are actively involved in fetching water?
3. How frequently you travel to fetch water per day? (dry and rainy season)
4. How much water do you use per day?
5. Do you access an alternative source? Why do access the alternative source? • How far is the alternative source from your residence? (in time and distance) • When do you use the alternative source? (dry time, wet time, throughout the year) • What is the quality of the water from this source? • Is there any mechanism you use to filter it?
6. What are the criteria to get water service from the water point? Who set up the criteria, what was your role in decision making?
7. For what purposes do you use the water? (from the main source, alternative source)
8. What can you say concerning water charges you are paying? • Do you know why you pay? • How much do you pay? • Is the tariff affordable?
9. What problems are you facing regarding water for home use?
10. Are there health problems related to the use of the water source?
Scheme Functionality
1. How is the functionality of the scheme? • How frequently do systems fail to work throughout the year? • How soon are they maintained? • How soon do systems fail after construction? What are the reasons? • Which type and part of the scheme often faces failure?
2. What kind of water scheme do you prefer and why? (Reason)
3. What do you think are the main reasons for failure? If operating for a longer time without breakdown what

do think is the reason?
Community Participation
1. Did you remember how the scheme was installed here? • What was the role of the community in problem identification, prioritisation, site selection, project design selection, and technology and service level selection? • Do you think that your views and comments were respected and taken into account while the project was being developed?
2. Explain how you participated in the construction of the scheme. What was your contribution during the scheme construction?
3. What influenced you to participate in project activities?
4. What contribution do you make to the following activities: • Operation and maintenance of the scheme? (cash, kind, labour, involvement) • Rehabilitation of the scheme and expansion of service?
5. Explain your rights and responsibilities in water service delivery and management.
6. Explain your participation in the water-related meetings.
Management of Water Service
1. Who is responsible for the day-to-day management activities of the water in the scheme?
2. Can you tell me how and when the WATSANCo came into being? • What are the criteria to select the members? Who set these? • What was your role during the selection? • What is the composition (gender, age, religion, poor and marginalised people) of the WATSANCo? Is there an incentive for being member? • What is the duration and term of operation for the WATSANCo?
3. What can you say about the management capacity of water service delivery by WATSANCos and tap attendants? • Do you feel satisfied with the management operation of the water service? If yes, what are the positive sides? If no, explain why not. • What do you think should be done to help them? • Are there any managerial problems? What are they?
4. Explain how transparent the committee is with regard to income accrued and expenditure? Does the committee call for formal meetings to report the financial status of the institution? If yes, how frequent?
5. Who is responsible for setting the water charge? How are decisions reached to set the tariff? What was your role in setting the water tariff? Did the tariff setting take into account the different socioeconomic conditions of the community? (willingness and capacity to pay, poor, middle income, better off, marginalised, women, etc)
6. How do you pay for the water service? (on-the-spot payment for the service, monthly payment for a definite volume of water etc)
7. Are you wiling to pay for the service with the set tariff and why?
8. How are operation and maintenance activities done?
Impact of Water Scheme (Positive and Negative)
1. Do you think the water supply system has changed the life of people in this community? In what ways? (explain the social, economic and health impacts of the scheme)
2. What are your comments for achieving sustainability of water and sanitation services in the area?

FGD for WATSANCos, caretakers, operators, mechanic, pump attendants, promoters

Objective: To uncover underlying factors impacting sustainability of water supply schemes
Institutional Factors
1. Can you tell me how and when the WATSANCo came into being? • What were the criteria of selection? • How was the participation of women, poor, youth, elderly, CBOs, Kebele Admin., NGOs? • Who organised the selection process? Kebele/NGOs/Woreda/BoWR? • When was the selection done? • How many times can a committee be selected? • What is the duration of service for WATSANCOs in one election?
2. What are the roles and responsibilities of WATSANCos? What do WATSANCos do?
3. What is the composition of WATSANCos in terms of gender, religion, economic status, location in the kebele? • Men to women ratio • Religious composition • Poor vs rich • Distant users vs users near by
4. Do you have a legal registration certificate? If so … (if no why not?) • To whom are you accountable? (kebele/Woreda Admin./WWRDO) • Do you report to them? When? About what? • What action can be taken by the WWRDO or community following the report? • Give examples
5. What incentive mechanisms are there for WATSANCos? (benefits in being a WATSANCo member?) • Increased social acceptance? • Trainings? • Money? • Increased awareness on hygiene and sanitation?
6. Do you report to the community about your activities? (Y/N)…….. (if no, why not?) • About what kinds of activities do you report to them? (Revenues and expenses?) • How frequently do you report? (once in…….) • How is the response of the community regarding your reporting?
7. How do you monitor the activities of every WATSANCo member and caretaker? A system to monitor daily revenue collection and other activities?
8. How do you manage your financial activities? • Have a bank account? • Have financial manual? • Have legal revenue collection receipts? • Have justifying documents (receipts, payroll, etc) for your expenses? • Properly handle financial documents? • Have a trained bookkeeper? • Financial reports?
9. Do you audit your financial and capital resources? • Who does the auditing? • How frequently? (once in a ……..)
10. Do you have a bookkeeping system for your incomes and expenses? Do you show it to relevant people or organisations as the need arise?

11. How is the technical capacity of WATSANCos to manage the scheme? • Have you taken trainings? What kinds of trainings? (financial, maintenance, managerial?) • By whom are they given? For whom? • How many trainings? How many WATSANCos trained? • How do you rate the trainings? Are they relevant?
12. Are users aware of their rights and responsibilities in water service delivery? • Attend meetings organised by WATSANCos? • Participate in the discussion? • Contribute in cash or labour for the scheme as requested by WATSANCos? • Feel sense of ownership of the scheme? • Clearly state their complaints/appreciation to you about the service delivery?
13. How is your-decision making process? (how do you make decisions?) • Does it follow your organisational rules and regulations? • Do you take minutes of meetings? • Implement decision made? • Consult the community?
Financial Factors
1. What are the main sources of income for operation and maintenance costs? • Revenue? • Fines? • Community fund raising? • Donations? Grants? • Support from Woreda/region?
2. How much is the water use tariff? How was it set? • Did it take in to account the different socioeconomic conditions of the community? • Poor, better off, marginalised, women? • Are they able to pay? (Y/N) (if no, why not?) • Willing to pay in accordance with the tariff? (Y/N) (if no, why not?) • What do you do when people are not paying for the service? • Do you have a system to support people who cannot pay for the service?
3. How do you see your annual income and expense in the past three to five years? • Compare your incomes and expenses. • What are the major expenditures? (the causes?)
4. Do you save money? (Y/N) • For what purposes do save? (maintenance, expansion, rehabilitation) • How much have you saved in the past three to five years?
Technical Factors
1. How is the functionality of the scheme? • How frequently does the system fail (per year)? • How soon is it maintained after breakdown?
2. What do you think are the major reasons for the breakdown/non-functionality? • Are there design problems? • Are there construction problems? • Is it technology selection? • Water quality problems? • Cultural matters?

3. Who selected the technology installed? • Community participated? • Community choice/recommendations addressed/included?
4. How do you explain the situation in relation to maintenance? • Which parts fail more recurrently? • Where do you get your spare parts for minor and major maintenance? • How is the price of spare parts? • How do you cover the price of spare parts? • Are there local private spare parts suppliers? • Do you get spare parts in a timely manner? • Do you do minor maintenance? • How many are locally maintained? (by whom?) • How many are maintained by external agents? (by whom?)
5. Is there a structural link between WATSANCo and the Woreda/NGOs? • Do they regularly visit you? How frequently? (once in……..) • How many times do they supervise you annually? • How many times has the Woreda/region supported you with maintenance?
WATSANCo Capacity Building and General Comments
1. How many trained WATSANCos and caretakers do you have? • How many trainings given? Aspects of the training? (O&M, financial, managerial) • How was the time allocated for the training? (sufficient?) • How did you find the trainings? (interesting? relevant?) • How were training manuals used? Were they easy to understand?
2. What can you say about the general water supply and demand in the village? • Insufficient for domestic activities? • People also use unsafe alternative sources? • Competitive uses for agriculture and domestic activities?
3. What do you think are the main challenges you face in water supply service delivery and management?
4. What do you think should be done to tackle these challenges and sustain the functionality of the scheme?
Thank you for your collaboration and patience

FGD for WWRDO

Objective: to identify gaps, challenges and opportunities for the sustainability of water supply schemes in the Woreda
Functionality and Service Level
1. How do you explain the functionality of the schemes developed in the Woreda? • How long do they perform after construction? (give special examples of difference) • How soon are they maintained? • Which schemes fail more recurrently and why? • Which schemes perform for a longer period of time without failure? Why? • Is it serving beyond its design population? • For what purposes are they used? (domestic, irrigation, cattle watering) Are there schemes which the people are not using although they are technically functional? If yes, why?

2. How do you see the schemes' capacity/ability to meet the water demand of user communities? • High population pressure on the schemes beyond the designed population? • What quality problems are there? Where? How do you understand the problem? • How is scheme location in relation to user communities? (near, average, far)
3. Are there any basic functionality differences in schemes developed by the government (Woreda/zone/region/fund) and NGOs? If yes, why?
4. Is there a regular monitoring system for the water quality of schemes? If yes……. • Who does the monitoring? • How soon? • Is the water quality analysis data in line with regional/WHO water quality criteria?
5. Are there any complaints by the user community on the quality of the water delivered? • What kinds of complaints are they? (taste, odour, colour) • Are there observed waterborne disease cases because of the use of the scheme?
Institutional, Technical and Financial Factors
1. What are the roles and responsibilities of the office regarding R-WaSH-related activities?
2. What criteria are there for WATSANCo selection?
3. How is your involvement in WATSANCo selection?
4. Is there a legal structure between your office and WATSANCos? If yes: • Do you have signed agreements? How frequently do they report to you? • About what do they report to you? If no: • How do you communicate? • To whom are the WATSANCos accountable? • How do you perceive the roles and responsibilities of WATSANCos?
5. What major barriers are there affecting the performance of WATSANCos? In what ways do they affect them?
6. In what ways do you support WATSANCos? • Capacity building? How many trainings have you given to them? In what aspects? • Budget allocation? For what purposes? (O&M?) • Human resource allocation? Technicians for major scheme failure maintenance? • Spare parts provision?
7. How do you perceive the legal status of WATSANCo and their accountability in case of mismanagement of the scheme resources? What is the office's role in correcting WATSANCo mismanagement?
8. What are the qualities of best performing WATSANCos in the Woreda? Who are they?
9. What are the causes of worst performing WATSANCo in the Woreda? Who are they?
10. What opportunities are there to make WATSANCos perform effectively and efficiently?
11. Do you do regular follow-up and supervision of the schemes and WATSANCos? • How frequently? • What aspects do you see while you supervise and follow up?
12. How do see the performance of your office in implementing the office's strategic plan and annual plan of the past five years? What do you intend to do for the next five years?
13. What factors affect your efficiency of implementation? In what ways? • Human resources? • Budget? • Integration with relevant stakeholders? • Logistics?

14. What are your accomplishments in R-WaSH-related activities in the past five years?
15. What do you think should be done to make the office more efficient and effective in implementing its strategic plans and optimise the overall working condition for sustainable R-WaSH intervention?
16. What factors most affect the sustainability of water supply schemes in the Woreda? • Spare parts: availability, price, local providers? • Design and construction problems? • Water quality problems? • Poor stakeholder communication? • WATSANCo inefficiency? • Low community awareness on hygiene and sanitation? • Low community participation?
17. Do you participate in feasibility studies (potential assessment; community, site and technology selection) and implementation phases of scheme development? If yes, how? If no, why not?
Higher-level Interaction
1. Do you communicate your strategic plans with relevant stakeholders? If no, why not?
2. Do the different actors working in R-WaSH interventions communicate their plans and activities to your office? If no, why not?
3. Are there any attempts to integrate the relevant actors working in the area of R-WaSH? If no, what are the reasons?
4. How do you perceive the roles of different actors working in the area of R-WaSH activities? (health, education, agriculture and rural development offices, NGOs)
5. I s there support from the zonal and regional water offices and NGOs? Y/N • What type of support do you get from them? • Which support is most important for the effective functioning of the office?
6. How do you explain the handover of water supply schemes developed by development partners?
7. What challenges and opportunities are there to integrate the relevant stakeholders in the area of R-WaSH to avoid duplication of efforts and bring positive change?
8. Is there a standard for scheme technology selection for the Woreda/region?
9. How do you observe the willingness and participation level of the community for the sustainability of their water schemes? What factors limit community participation?
10. What do you think should be done to effectively and efficiently sustain the functionality of schemes?
Thank you for your collaboration and patience

Interview for Woreda Administration (Council)

1. How do you perceive your office's roles and responsibilities in the development and sustainability of rural water supply, sanitation and hygiene activities? • What barriers are there to stop you from performing your roles and responsibilities? • In what ways do they challenge you?
2. How do you perceive the roles and responsibilities of stakeholders (such as WWRDO, Health Office, Agriculture and Rural Development Office, NGOs, CBOs and the community) working in the area of R-WaSH interventions?
3. Do you work with the stakeholders? Y/N. If no, why? If yes, how?
4. How do you support the R-WaSH activities in the Woreda? • Include these activities in your strategic plans and allocate budget? • Financial support for the community for maintenance/expansion/rehab/?

• Look for support/grants?
5. Is there a coordinated effort by stakeholders to integrate their tasks for common activities? Y/N. If no, why? If yes, how? (strategic plans, fund allocation, capacity building)
6. Are there barriers that hindered the collaboration? What are they? (bureaucracy, lack of system of communication, lack of knowledge of roles and responsibilities of actors, lack of manpower)
7. What factors are most significant in impacting your task performance positively and negatively? • How do they affect positively? • How do they affect negatively?
8. Do you share information with stakeholders on their tasks? How?
9. What factors affect implementation efficiency of your plans?
10. Do you supervise the R-WaSH activities being undertaken in the Woreda? Y/N. If yes, how? If no, why not?
11. What do you think should be done to sustain the water supply, hygiene and sanitation activities in the Woreda?
Thank you for your collaboration and patience

Interview for Health Office

General Details					
1. Woreda					
2. Kebele					
3. Name of organisation					
4. Date of survey					
5. Name of investigator					
6. Interviewee background information					
Name					
Sex		Age		Educational qualifications	
Past work experience					
Position in the organisation					
Service years in the organisation					
Major responsibilities					
1. What are the office's roles and responsibilities in R-WaSH interventions in the Woreda? What are the challenges affecting the office's performance efficiency?					
2. Do you integrate your plans with other relevant stakeholders such as WWRDO, Woreda Administration, NGOs and CBOs working in R-WaSH interventions? Y/N. If yes, how? If no, why not?					
3. How does the sustainability water supply scheme relate to your office's activities?					
4. Is there a situation where a scheme breakdown/non-functionality or contamination has resulted in increased health problems? If yes: • How? Where? • How was it solved? How did you know about it, do you have a data?					
5. What are the major water-related diseases in the Woreda? Why and how do they occur? (show document)					

6. How do you explain the perception of communities in the Woreda about water supply, hygiene and sanitation activities? Does the office work on change of community behaviour? How?
7. What mechanisms does your office use to achieve its plan and objectives?
8. Do you support WaSHCos? If yes, how? (give trainings? on what aspects? how many trainings given?
9. How do you see the performance of your office in implementing the office's strategic plan and annual plan of the past five years? What do you intend to do for the next five years?
10. How do you explain the importance of sustainable water supply in improving the health of the community?
11. What factors most affect the office's efficiency of implementation? • In what ways do they affect the office's efficiency? • Human resources, budget, integration with relevant stakeholders, logistics?
12. What do you think should be done to make the office more efficient and effective in implementing its strategic plans and optimise the overall working condition for sustainable R-WaSH intervention?
13. What do you think should be done to effectively and efficiently sustain the functionality of schemes?
Thank you for your collaboration and patience

Key informant interviews

Interview for Kebele Administration (Chairperson)
1. Can you tell me how and when the WATSANCo came into being? (criteria of selection, participation of women, youth, elderly, CBOs, Kebele Admin., NGOs, organisers of the selection, etc)
2. How do you see the composition of the WATSANCo? (gender, age, religion, poor and marginalised people)
3. What was the kebele's role during scheme development? (problem identification and prioritisation, community mobilisation, WATSANCo selection, etc)
4. What is the kebele's role in the scheme management? (collaboration with WATSANCos, WATSANCo promotion, request for support to the Woreda, etc)
5. How do you see the performance of WATSANCos in scheme management? (financial management, transparency, reporting, quality of service delivery, complaint acceptance and correction)
6. Do you know to whom the WATSANCos are accountable?
7. What will be done if WATSANCos mismanage the scheme? (technical inability, corruption, discrimination, etc) What can the kebele do if it gets information of mismanagement by the WATSANCo?
8. What else does the kebele do in water supply, sanitation and hygiene in its locality?
9. What do you think should be done to tackle the challenges facing WATSANCos in scheme management?
10. What complaints are there about the use of the water scheme? (quality, quantity, distance, waiting time, scheme failure, speed of maintenance, WATSANCo concern, service delivery, etc)
Key Informant Interview
1. Can you tell me how and when the WATSANCo came into being? (criteria of selection, participation of women, youth, elderly, CBOs, Kebele Admin., NGOs, organisers of the selection, etc)
2. How do you see the composition of the WATSANCo? (gender, age, religion, poor and marginalised people)
3. How do you participate in scheme management? (community mobilisation, WATSANCo promotion, funds granting for scheme upgrading/rehab/maintenance, etc)
4. What else you do in water supply, sanitation and hygiene activities in your locality?
5. How do you see the performance of WATSANCos in scheme management? (financial management, transparency, reporting, quality of service delivery, complaint acceptance and correction)
6. What do you think should be done to tackle the challenges facing WATSANCos in scheme management?

7. How do you explain the community demand for water in relation to its population? (pressure on scheme, community conflict, difficulty in providing quality service)					
8. What complaints are there about the use of the water scheme? (quality, quantity, distance, waiting time, scheme failure, speed of maintenance, WATSANCo concern, service delivery, etc)					
General Details					
1. Woreda					
2. Kebele					
3. Specific location					
4. Coordinates	E		N		
5. Date of interview					
6. Name of investigator					
7. Water source used					
8. Interviewee background information					
Name					
Sex		Age		Educational qualifications	
Water point no.					
Position held in the community					

NGO interview

General Details					
1. Woreda					
2. Kebele					
3. Name of the organisation					
4. Date of survey					
5. Name of investigator					
6. Interviewee background information					
Sex		Age		Educational qualifications	
Position in the organisation					
Service years in the organisation		Major responsibilities			
Organisational Activities					
1. What is the role of your organisation regarding R-WaSH-related activities?					
2. What is your next five/10-year strategic plan in the sector?					
3. How do you see your relations with other actors in the sector?					
4. How do you think it is possible to integrate your tasks with other government sectors and CBOs?					
5. Is there an external body that assesses the performance of your activities? Who/how?					
Community Participation					
1. Explain how you identify and prioritise water-needy villages?					
2. In what ways are the local communities taken into consideration during the development of the scheme? • What was the role of the community during the pre-feasibility and feasibility study of the project?(problem identification, prioritisation, site selection, project design selection, technology and service level selection) • How did the handover of the schemes taken place?					

• How does the local community participate in the implementation, management and monitoring of the scheme?
3. What constraint do you face regarding community participation in project activities?
Type of Scheme Technology
1. How is the nature of the scheme you installed in the Woreda? (type of technology, number, water volume, design period, service lifespan, beneficiaries, type of water use, beneficiary intended at design period versus current no. of users, community participation, population consideration) (document review)
2. Do you have any selection criteria for scheme technology? (standard) Is the implementation of the scheme as per the design? (document review)
Community Empowerment
1. What are your strategies to ensure long-term sustainability of the water schemes you installed?
2. How are the communities empowered to run the schemes? (technical aspect, financial aspect, organisational aspect)
Management of Water Service
1. What are the present water management strategies of the schemes you have constructed? How do you see it?
2. How do you handle issues related to O&M of the water schemes and availability of spare parts?
3. Do you visit the WATSANCOs?(no. visits and supervision per year)
4. What efforts do you put in place to make the water supply systems sustainable? (including those developed by you and others) (type of support: spare parts provision, maintenance, capacity building, fund granting)
5. Explain the performance of water schemes in the villages you have constructed so (considering: quality of water, quantity of water, satisfaction and reliability to users) Do you have water quality test records of the schemes you installed?(initial testing and evidence of regular testing) (document review)
6. How do you handle sanitation issues in the project area?
7. Give your comments on what should be done for the water service delivery to be sustainable?

KAP survey: community key informants

General Details						
1. Woreda						
2. Kebele						
3. Specific location						
4. Coordinates	E			N		
5. Date of interview						
6. Name of investigator						
7. Water source used						
8. Interviewee background information						
Name:						
Sex		Age		Educational qualifications		
Water point no.						
Position in household/community						
1. Briefly explain how you have been involved in each of the three phases (problem identification, implementation and O&M of water and sanitation service delivery?						
2. What was your experience of this? Did/do you feel that your views are respected and taken into						

account?
3. How do you understand your role and the role of others in ensuring the sustainability of the water supply system?
4. How do you perceive yourself and others to perform in these roles?

KAP survey: planners and service providers (NGOs, Woreda Admin, sector offices)

General Details					
1. Woreda					
2. Date of interview					
3. Name of investigator					
4. Name of organisation					
5. Interviewee background information					
Name:					
Sex		Age		Educational qualifications	
Religion: ☐ Protestant ☐ Orthodox ☐ Catholic ☐ Muslim ☐Traditional ☐ Other					
Position in the organisation					
Service years in the organisation					
Past experience					
No. years position held					
1. Can you briefly explain your (individual) role in providing water and sanitation services? (decision making, implementation, O&M, capacity building, collaboration with stakeholders)					
2. What are the skills and knowledge that you bring to your work? (professional background, experience, trainings received)					
3. What are the links that you have with others (within and out side your organisation) in doing your work (leadership diagram/organigram?)					
4. How do you interact with water users at your work? What is their role? How do they full fill it?					
5. What motivates you about your work? What do you like doing?					
6. What demotivates you about your work? What do you not like doing?					
7. What do you see as the main blockages of your work? • In your role and skills? • In the roles and skills of others? • In the overall working environment?					
8. How do you know that are you are performing efficiently? How are you assessed?					
9. How do you use information at your work? What info is most important to you? Where do you get it?					

Institutional mapping and stakeholder analysis

Objectives: • To identify the different stakeholders in water service provision • To analyse their roles, mandates and influence • To analyse the potential of institutions/stakeholders to play a role in improved water governance
Depending on the situation on the ground, a workshop or an interview or both will be conducted to answer the following questions in the two operational Woredas.

1. What are the different stakeholders involved in R-WaSH activities? (primary, secondary, tertiary)
2. What are the roles and responsibilities of these stakeholders in R-WaSH activities? • Which tasks are performed by which actors? • What activities do the actors do in the process of performing their tasks? • Gaps and overlaps? • Is there a coordinated effort by relevant stakeholders to integrate their tasks? • What factors are there affecting positively and negatively their task performances? • What information is held by which stakeholders that helps them to perform their tasks? • Is information being shared? And how? • Who has most power/influence?
3. Are the development, rehabilitation and O&M of rural water supply and sanitation activities part of the scope of the institution's current activities? How do you explain your scope of activities?
4. How do you see your institution's commitment on the need for moving towards sustaining the rural water supply and sanitation activities? Do you have strategic and annual plans? (can you give us a copy?)
5. Will there be a possibility of negatively affecting the interests of others while you are undertaking the intervention (on new to develop one and existing schemes)? Whose interest will be affected? How?
6. What do you think should be done to bring a positive change in R-WaSH interventions? (working together?)
7. Do you have the necessary resources (financial, human, knowledge base, leadership, organisational capacities) needed to implement the intervention and achieve positive changes? What is you are lacking? (document review)

Organisational resource mapping

General Details						
1. Woreda						
2. Kebele						
3. Name of organisation						
4. Date of survey						
5. Name of investigator						
6. Interviewee background information						
7. Position in the organisation						
8. Service years in the organisation						
Human Resources	Sex: M/F Qualifications: Masters/Degree/Diploma/Certificate/High School graduate/elementary/non-formal education					
Position (technical staff)	Sex	Age	Quals	Service years	Responsibility	Remarks
Position (support staff)						
Remarks (turnover, individual carrying out different duties)						

Physical Resources					
Building structures equipment, materials, etc	Quantity	Functionality		Use	Remarks (how they use it, sharing?)
		F	NF		
Building blocks					
Offices					
Computers					
Photocopiers and printers					
Phone lines					
Generators					
Private water scheme					
Vehicles					
Field equipment/tools					

Information Resources			
	Yes	No	
Information desk?	☐	☐	
Information library?	☐	☐	
Documented minutes of meetings?	☐	☐	
Documented reports?	☐	☐	
Makes project presentations?	☐	☐	
Communicates management board decisions?	☐	☐	
Makes project team regular meetings?	☐	☐	
Makes video/audio and TV/conferences/radio?	☐	☐	
Websites and internet?	☐	☐	
Publishes magazines?	☐	☐	
Publishes brochures?	☐	☐	
Organises conferences?	☐	☐	
Organises exhibitions?	☐	☐	
Organises workshops?	☐	☐	
Working telephone?	☐	☐	
CD-ROM/floppy	☐	☐	
Documents	☐	☐	
Pamphlets	☐	☐	
Posters	☐	☐	
Drawings	☐	☐	
Maps	☐	☐	
Remarks			

WATSANCo resource mapping

General Details								
1. Woreda								
2. Kebele								
3. Water point no.								
4. Date of survey								
5. Name of investigator								
6. Interviewee background information								
Sex		Age		Educational qualifications				
Position in the WATSANCo: ☐ Chairperson (head) ☐ Finance head & secretary ☐ Cashier ☐ Scheme supervisor ☐ Purchaser ☐ Storekeeper ☐ Other (specify)								
Service years in the committee								
Human Resources								
Number of WATSANCo members		Male no.		Female no.				

Position	Sex	Age	Religion	Service years	Education	Active members
Chairperson (head)						☐
Finance head and secretary						☐
Scheme supervisor						☐
Cashier						☐
Purchaser						☐
Store keeper						☐
						☐
						☐

Other staff members

	No.	M.	F.	Age	Education	Service years	Replacements (no. of times)	Remarks
Caretakers								
Technicians								
Guards								
Other								
Other								

Physical Resources F=Functional NF=Non-functional

Equipment (mandatory for quality service delivery)	Type	Quantity	Number		Remarks
			F	NF	

Financial Tracking

	1997		1998		1999	
Month	Income	Expenditure	Income	Expenditure	Income	Expenditure
Meskerem						
Tikimt						
Hidar						
Tahsas						
Tir						
Yekatit						
Megabit						
Miazia						
Ginbot						
Sene						
Hamle						
Nehase						
Total						

Monthly Recurrent Expenditure		
Expenditures	Amount in Birr	Remarks
Salary		
Petrol/electricity		
Transportation		
Expendable materials		
Per diem		
Maintenance		
Mechanics (big repairs)		
Spare parts		
Other		
Other		
Major income sources:		
Comments		

Water point mapping

1. Woreda			Date of survey		
2. Kebele					
3. Specific location					
4. Coordinates	E		N	Alt	
5. Climate	☐ kolla ☐ dega				
6. Nearby institutions (school, clinic, kebele, church)					
7. Physical characteristics of area (plain, mountain, rocky)					

8. Name of investigator					
9. Water point no.					
10. Scheme type		Year of construction			
11. Number of population being served		In the beginning			
		Currently			
12. Number of households using the scheme					
13. Current status	☐ Functional (being used) ☐Non-functional/dry				
WP: Water Point	Functional WP		Non-functional WP		
14. No. of water points	FN faucets		FN faucets		
	NF faucets		NF faucets		

Access to adequate safe water supply from the water point, wet period (non summer)				
Options	Score	Hand pump score	Public stand post score	Spring score
Water point dry/non-functional, users go to unprotected water sources (river, canal, etc)	0			
Water point dry/non functional, users go to a nearby water point	25			
Water available intermittently, users go to another nearby water point	40			
Benchmark: adequate water throughout for basic domestic needs for regular users; other sources available for bathing/washing	50			
Adequate water for all domestic needs throughout, for regular users	75			
Ideal: In addition, capacity available for outside beneficiaries as well	100			
Reason for score				

Access to adequate safe water supply from the water point, dry period (summer)				
Options	Score	Hand pump score	Public stand post score	Spring score
Water point dry/non-functional, users go to unprotected water sources (river, canal, etc)	0			
Water point dry/non-functional, users go to a nearby water point (>250 metres)	25			
Water available intermittently, users go to a nearby water point (<250 metres)	40			
Benchmark: adequate drinking water for all regular users	50			
Adequate water drinking/cooking for all regular users; other sources bathing/washing clothes	75			
Ideal: Adequate water available for all domestic needs for regular users	100			
Reason for score				
Water predictability				
Stand post				
Options		Score	Summer	Non

		score	summer score
Supply unpredictable, don't know if water will come or not	0		
Know supply is every day, but exact time unknown	25		
Know supply is either in morning/afternoon, but exact time unknown	50		
Supply at scheduled times and fully predictable	75		
Water always available	100		
Reason for score			

Hand pump			
Options	Score	Summer score	Non summer score
Supply unpredictable, don't know if water will come or not	0		
Know water will come at some time, but don't know when – maybe at night	25		
Know water will come at some time – maybe a few hours later	50		
Need to pump for a short while to get water	75		
Water always there in pump, and supply is hence predictable	100		
Reason for score			

Water quality (user perception)	Score	Hand pump score	Public stand post score	Spring score
Not used for any domestic use	0			
Used for domestic purposes, but with complaints (e.g., muddiness, bad smell)	25			
Benchmark: used for all domestic purposes without any complaints (even muddiness)	50			
In addition, CBO officials have certified that there are no quality problems	75			
Ideal: In addition, water quality has been certified by outside reputed agency	100			
Reason for score				

Testing of the water source for quality (to ask implementer)		
Question	Yes/No	Remarks
Was the water from this water point tested for quality?		If yes, date
If tested, was the water point reported for bad water quality?		
Are you aware which parameter is in excess in the water (EC, nitrate, fluoride, pathogens)?		
Any measures taken to overcome the quality problems?		If yes, specify

Symptoms of fluoride contamination among users? (tick)	Score	Hand pump score	Public stand post score	Spring score
Visible evidence of skeletal fluorosis (bent arm and leg bones)	4			
Visible evidence of dental fluorosis (discoloured teeth)	3			
No visible evidence but complaints of joint pains	2			

No symptom of fluoride	1			
Stagnant water around the water point				
Options	Score	Hand pump score	Public stand post score	Spring score
No drain; large stagnant water pool and overflow, platform broken or dirt around water point	0			
Drain exists, but still stagnant water pool and overflow, platform broken or dirty	25			
Benchmark: good finished water point, clean environment, no visible pollution around the water point (no latrine, cattle yards, etc)	50			
In addition, cultivated grass and plants are present around the water point	75			
Ideal: in addition, fence around the water point, drain to a nearby home garden	100			
Reason for score				
Social barriers to access the water point				
Options	Score	Hand pump score	Public stand post score	Spring score
Stand posts are reserved for specific class in that area and access is limited to only those families.	0			
Stand posts are reserved for specific class in that area and access is limited to only those families. But some people with influence or influenced people are allowed	25			
Benchmark: all the points in the village are accessible to all class groups at least during the repairs of other water points, emergencies	50			
In addition, allow selected outside users to take water – when excess capacity is available	75			
Ideal: no restriction on water collection from all the points for all the people in the village	100			
Reason for score				
Financial barriers to access the water point: Are households able to pay for water. What sanctions if they can not pay?				
Volume of water a household is allowed to take (does this depends on household size?) Is there a difference between the different households? (also social barrier)				
System of user payment for O&M of the water point				
Options	Score	Hand pump score	Public stand post score	Spring score
No system of regular user payment – and no payment	0			
There is a system of regular user payment, but no	25			

payments or payments are irregular				
Benchmark: there is a system of regular water payment and most pay regularly; OR they collect payment as and when needed for major repair and rehabilitation	50			
There is a system of water payment and all pay regularly – even to cover major repair and rehabilitation	75			
Ideal: in addition, payment is based on ability to pay (graded rate system)	100			
Describe the payment system: tariff per volume, fixed prices, or combined: payment for water use and separate contribute for O&M				
Reason for score				

Problem	Code	Hand pump score	Public stand post score	Spring score
Overcrowded (more than 10 families using it, in general)	1			
Overcrowded (more than 10 families using it, in dry period)	2			
Far away from households (>250m one way distance)	3			
Drop in yield in dry period (water table falls)	4			
Bad water quality (visible iron and manganese contamination and hard water (taste))	5			
Unsafe (side wall collapse, bottom cave-in and apron seriously damaged, etc)	6			
Other (specify)	7			

What is the repair situation of the water point?		
Has this water point required repairs over the past 12 months?	Yes/No	
Type of repair required	(Major: repairing collapsed walls, deepening, pump out of order more than one day, etc) (Minor: patchwork to the apron and walls, replacing pulleys, rope, bucket, pump repaired same day, etc)	
Who does the repair?		
Time between breakdown and repair		

Functionality of the water point (Hand pump)		
	Yes/No	
Is the hand pump functioning?		
Is the apron around the tube well intact?		
Is it working without noise?		
Is the top of the hand pump above ground (water tank) free from corrosion?		

Leakage – pipe schemes (non-revenue water (NRW) or unaccounted for water (UfW))			
Level of leakage	Score		

Severe leakage, fully affects supply (NRW very high)		0		
Frequent leakage, partly affects supply (NRW above acceptable limit)		25		
NRW slightly higher than acceptable limit, does not affect supply		50		
NRW at acceptable/design limits		75		
NRW below acceptable/design limits		100		
Reason for score				
Quality of water source				
Nature of contamination	Surface water source present? (Y/N)		Groundwater source present? (Y/N)	
Agricultural (chemical) waste				
Sediments from erosion				
Human faeces				
Animal faeces				
Leaves, dust, etc				
Natural rock strata (e.g., fluoride, iron, manganese, calcium, etc)				
Any other (specify)				
Comments and observations				
Source protection mesures (pollution) : What measures have been taken to limit pollution?				
Options			Surface water Y/N	Groundwater Y/N
Silt barriers or traps?				
Direct discharge from polluting sources prevented?				
Natural (vegetative) barriers constructed?				
Chlorination at the source?				
Fencing to prevent animals from contaminating the source?				
Catchment control (with people's participation)				
Prevention of discharge from chemical fertilisers				
Control people's behaviours that contribute to pollution?				
Remarks				
Nature of protection for the water source				
Options		Score	Hand pump score	Public stand post score	Spring score
Beneficiaries not aware of the need for source protection or conservation		0			
Beneficiaries aware of the need, but no action taken		25			
Benchmark: beneficiaries aware of need for source protection; source protection is part of village (environment); action plan and hand pump committee established		50			

In addition, committee reviews source protection measures every year	75			
Ideal: in addition, committee has repaired source protection measure as required (with help of NGO or relevant government line agency as required)	100			
Reason for score				
Conservation of water source Were any measures taken to conserve surface water? ☐ Y ☐ N				
If yes, what measures were taken?				

Options	Surface water Y/N	Groundwater Y/N
Afforestation of catchment area?		
Surface water recharge structures check weirs, control weirs, check dams		
Diversion upstream or artificial recharge		
Participatory watershed management (control of open grazing, upstream over-abstraction, etc.)		
Any other? Specify		
Remarks		

Water Scheme mapping

1. Woreda		Date of survey					
2. Kebele							
3. Specific location							
4. Coordinates			N		Alt		
6. Climate	☐ kolla ☐ dega						
7. Nearby institutions (school, clinic, kebele, church)							
8. Physical characteristics of area (plain, mountain, rocky)							
9. Name of investigator							
10. Water scheme No.							
11. Year of construction							
12. Installing organization							
13. Number of population being served	In the beginning						
	Currently						
14. Number of households using the scheme							
15. Depth							
Design population		Service life span					
Type of scheme technology							
Water source							
Current Status	☐ Functional *(being used)*	☐Non-functional					
Number of water points		Functional WP		Non-functional WP			
Reservoir Quantity		Capacity (in lit or m3)					

Reservoir type	☐ Concrete ☐ Plastic		☐ Steel
Reservoir status	☐ Well functioning	☐ Severely leaking	☐ Non-functional
Power source	☐ Generator	☐ Electricity	
Pump properties	Head	Power	
Pump type	☐ Mono pump	☐ Submersible	
Pump power			
Discharge rate			
Scheme brand			

Check points	Yes	No	Remark
1. Reservoir head well covered?	☐	☐	
2. Scheme well fenced?	☐	☐	
3. Scheme pipe system severely leaking	☐	☐	
4. There is scheme guard?	☐	☐	
5. Power house well constructed?	☐	☐	
6. WaSHCo office near by?	☐	☐	
7. Has water meter?	☐	☐	
8. Hand pump working well?	☐	☐	
9. Metal works corroded?	☐	☐	
10. Distribution pipeline leaking?	☐	☐	
11. Water treatment plant available?	☐	☐	
12. Irrigation activities using the scheme?	☐	☐	
13. Latrines close to the scheme?	☐	☐	
14. Scheme close to settlement area?	☐	☐	
15. Scheme area flood prone?	☐	☐	
16. Cattle trough around the scheme?	☐	☐	
17. Washing and bathing near the scheme?	☐	☐	
18. Land slide problems around the scheme?	☐	☐	
19. Scheme close to a water body?	☐	☐	
20. Spring area well protected?	☐	☐	

Annex 2: Water point and scheme mapping

Water scheme mapping 1-8

No.		1	2	3	4	5	6	7	8
Kebele		Debeso	Bendo	Ajohulqo	Yataoberho	Felqa	U/Tuka	1st Tuka	1st Ansha
Coordinates	E	38.13973	38.16'587	38.19'677	38.22'546	38.11'511	38.10'007	38.10'949	38.10'446
	N	7.17'004	7.29'796	7.34'557	7.39'113	7.15'866	7.25'064	7.22'096	7.19'179
	Alt. (m.)	1,894	1,788	1,792	1,733	1,875	1,957	1,919	1,871
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		School	Clinic	School	School	School	School	School	Clinic
Physical characteristics		Plain	Plain	Plain	Plain	Plain	Mountainous	Plain	Plain
Year of construction (EC)		1966	1991	1999	1998	1997	1996	1995	1983
Installing organisation		BoWR	ESRDF	Water Action	BoWR	Water Action	BoWR	ESRDF	BoWR
Financer		Government	Government	Water Action	UNICEF	Water Action	UNICEF	Government	Government
Population served	Beginning								8,000
	Currently								
No. HH				852					
Depth (m.)		318	250	180	97	362	286	266	> 317
Design population							4,000		
Technology		Motorised	Motorised	Motorised	Motorised	Motorised	Motorised	Motorised	Motorised
Water source		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
FN or NF?		FN	NF	FN	NF	NF	FN	FN	NF
Reason for NF			Generator		Generator	Pump failure			Pump failure
How long NF (months)			24		12	8			108
Repaired past 12 months		No	No	No	No	No	Yes	No	No
Who does repair							Government		
Months breakdown to repair			Not yet		Not yet	Not yet	1		Not yet
No. points		5	2	2	4	2	1	2	1
No. FN points		4	2	2	4	2	1	2	1
No. NF points		1	0	0	0	0	0	0	0
Reservoir	Quantity	2	1	1	3	1	1	1	1
	Capacity (m^3)	14	4.5	10	24	10	8	8	4
	Type	Plastic	Steel	Plastic	Steel	Plastic	Steel	Steel	Steel
Reservoir status		FN	Severe leakage	FN	Severe leakage	FN	Severe leakage	FN	FN
Power source		Electricity	Generator	Generator	Generator	Electricity	Generator	Generator	Generator
Generator type		Electricity	Lombardini	Deutz	Deutz	Electricity	Deutz	Deutz	Marellimotori
Generator power				30KVA		17KW	60KVA	56KW	
Pump type		Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible
Pump property	Head (m)			283	325	250			
	Power (KVA)		31.5	15	24.5	11			
Discharge rate (l/sec.)		3	3.9	7.3	4.9	3	2.5	4.5	2
Reservoir head well covered		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scheme well fenced		Yes	No	Yes	No	Yes	No	Yes	No
Pipe system severely leaking		Yes	2	2	Yes	2	2	Yes	2
Scheme guard		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power house well constructed		Yes	Yes	Yes	Yes	Yes	Yes	Yes	2
No.		1	2	3	4	5	6	7	8
Kebele		Debeso	Bendo	Ajohulqo	Yataoberho	Felqa	U/Tuka	1st Tuka	1st Ansha
WATSANCo office nearby		Yes	No	Yes	No	Yes	No	No	No

Water meter		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Metal works corroded		No	No	No	Yes	No	Yes	No	Yes
Distribution pipeline leaking		No	Yes	Yes	No	No	No	No	Yes
Water treatment plant		No	No	Yes	No	Yes	No	No	No
Irrigation activity using scheme		No	No	No	No	No	No	No	No
Latrines close to scheme		No	No	No	No	No	No	No	Yes
Close to settlement area		Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Scheme area flood prone		No	Yes	No	Yes	No	Yes	Yes	No
Cattle trough around scheme		Yes	Yes	Yes	Yes	Yes	No	No	Yes
Washing and bathing near		No	No	Yes	No	Yes	No	No	No
Landslide problems		No	No	No	Yes	No	Yes	No	No
Scheme close to water body		No	No	No	No	No	No	No	No
Contamination	Sediment from erosion	No	No	No	Yes	No	No	Yes	No
	Human faeces	No	No	No	Yes	No	No	No	Yes
	Animal faeces	Yes	No	No	No	Yes	Yes	Yes	No
	Leaves, dust, etc	Yes	No	No	No	Yes	Yes	Yes	No
	Natural rock strata (e.g. fluoride)	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Measures to limit pollution	Silt barrier or trap	Yes	No	No	No	No	No	No	No
	Polluting sources prevented	Yes	Yes	Yes	Yes	No	No	Yes	Yes
	Natural barriers constructed	No	Yes	No	Yes	No	No	Yes	No
	Chlorination	No	No	No	No	No	No	No	No
	Fencing	Yes	No	Yes	No	Yes	Yes	No	No
	Catchment control	No	Yes	No	Yes	No	No	Yes	No
	Prevention of discharge from chemical fertilisers	Yes	Yes	Yes	No	No	No	Yes	Yes
	Control behaviour that contributes to pollution	No	No	Yes	Yes	Yes	No	No	No
Nature of protection for source		25	0	50	80	0	20	80	25
Conservation of water source	Afforestation of catchment area	No	Yes	Yes	Yes	No	Yes	Yes	No
	Surface water recharge structures	No	No	No	No	No	No	Yes	No
	Diversion upstream or artificial recharge	No	No	No	No	No	No	No	No
	Participatory water shade management	No	No	No	No	No	No	Yes	No
Fluoride content (mg/l) (**BOWR**, Water Action)		**3.9**	**13.1**			3.8,5.5,1.3	**5.4**	**3.4**	
Date of testing (EC)		**5/5/1997**	**4/5/1997**				**6/5/1997**	**5/5/1997**	
Construction cost			640,000					668,439.06	

Water scheme mapping 9-16

No.		9	10	11	12	13	14	15	16
Kebele		Hamata	1st Meqala	2nd Meqala	Ashoca	1st Choroqo	Alem Tena	Qobochobare	Roqanene Tefo
Coordinates	E	38.08'189	38.06'668	38.08'834	38.07'796	38.06'193	38.06'770	38.17'001	38.15'329
	N	7.20'409	7.17'164	7.16'215	7.14'719	7.20'000	7.21'850	7.23'815	7.21'182
	Alt. (m.)	1,822	1,758	1,793	1,752	1,789	1,795	1,795	1,834
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		School	Kebele office		School	School	School		Health post
Physical characteristics		Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain
Year of construction (EC)		1997	1978	1993	1996	1996	1996	1978	1978
Installing organisation		Water Action	BoWR	Water Action	Water Action	Water Action	Water Action	BoWR	BoWR
Financer		Water Action	Government	Water Action	Water Action	Oxfam GB	Water Action	Government	Government
Population served	Beginning		3,000						
	Currently								
No. HH					882	946			
Depth (m.)		219.2	174	262	217	183.5	230	216	257
Design population					3,570	4,552			
Technology		Motorised	Motorised	Motorised	Motorised	Motorised	Motorised	Motorised	Motorised
Water source		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
FN or NF?		FN	FN	NF	NF	FN	NF	FN	FN
Reason for NF				Pump failure	Pump failure		Pump failure		
How long NF (months)				12	12		12		
Repaired past 12 months		Yes	No	No	No	No	No	No	No
Who does repair		NGO							
Months breakdown to repair		1.5		Not yet	Not yet				
No. points		2	2	4	4	5	4	2	2
No. FN points		2	1	4	4	5	4	1	0
No. NF points		0	1	0	0	0	0	1	2
Reservoir	Quantity	1	1	1	1	1	1	1	1
	Capacity (m^3)	15	4	25	25	25	25	4	4
	Type	Concrete	Steel	Concrete	Concrete	Concrete	Concrete	Steel	Steel
Reservoir status		FN	Severe leakage	FN	FN	FN	FN	Severe leakage	Severe leakage
Power source		Generator	Generator	Generator	Generator	Generator	Generator	Generator	Generator
Generator type		Lister Peter (TS3)	Daewoo	Deutz	Lister Peter (TS3)	Lister Peter (TS3)	Lister Peter (TS3)		Daewoo
Generator power		18.5KW	40KVA	38KW	22.2KW	22.2KW	25.9KW		
Pump type		Mono-lift	Submersible	Submersible	Mono-lift	Mono-lift	Mono-lift	Submersible	Submersible
Pump property	Head (m)		250	250					
	Power (KVA)		12.5	11					
Discharge rate (l/sec.)		0.5	5	3	4	6	3.5	2.22	2.6
Reservoir head well covered		Yes	Yes	Yes	Yes	Yes	Yes	No	No
Scheme well fenced		Yes	No	No	No	Yes	No	No	No
Pipe system severely leaking		Yes	2	2	2	2	2	Yes	Yes
Scheme guard		Yes	2	Yes	Yes	Yes	Yes	Yes	Yes
Power house well constructed		Yes	Yes	Yes	Yes	Yes	Yes	2	Yes
WATSANCo office nearby		Yes	No	No	Yes	Yes	Yes	No	No
Water meter		Yes	Yes	Yes	Yes	Yes	Yes	No	No
Metal works corroded		No	Yes	Yes	No	No	No	Yes	Yes
Distribution pipeline leaking		No	Yes	No	No	No	Yes	Yes	Yes
No.		9	10	11	12	13	14	15	16
Kebele		Hamata	1st Meqala	2nd Meqala	Ashoca	1st Choroqo	Alem Tena	Qobochobare	Roqanene Tefo
Water treatment plant		No	No	No	No	No	No	No	No

Irrigation activity using scheme		No	No	No	No	No	No	No	No
Latrines close to scheme		Yes	No	Yes	No	No	No	No	No
Close to settlement area		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scheme area flood prone		No	Yes	No	No	No	No	Yes	No
Cattle trough around scheme		No	Yes	No	No	No	No	Yes	Yes
Washing and bathing near		No	No	No	No	No	No	No	No
Landslide problems		No	No	No	Yes	No	No	No	No
Scheme close to water body		No	No	No	No	No	No	No	No
Contamination	Sediment from erosion	No	Yes	No	No	No	No	Yes	Yes
	Human faeces	No	No	Yes	No	No	No	No	No
	Animal faeces	Yes	Yes	No	Yes	Yes	No	Yes	Yes
	Leaves, dust, etc	No	Yes	No	No	Yes	Yes	Yes	Yes
	Natural rock strata (e.g. fluoride)	No	No	No	No	No	Yes	Yes	Yes
Measures to limit pollution	Silt barrier or trap	No	No	No	No	No	No	No	No
	Polluting sources prevented	No	No	No	No	No	No	Yes	Yes
	Natural barriers constructed	Yes	No	Yes	Yes	No	No	No	No
	Chlorination	No	No	No	No	No	No	No	No
	Fencing	Yes	No	No	Yes	Yes	Yes	No	No
	Catchment control	No	No	No	Yes	Yes	No	No	No
	Prevention of discharge from chemical fertilisers	No	No	No	No	No	No	Yes	Yes
	Control behaviour that contributes to pollution	Yes	No	Yes	Yes	Yes	Yes	No	No
Nature of protection for source		100	0	0	25	100	0	0	0
Conservation of water source	Afforestation of catchment area	Yes	Yes	No	Yes	No	No	No	No
	Surface water recharge structures	No	No	No	No	No		No	No
	Diversion upstream or artificial recharge	No	No	No	No	No	No	No	No
	Participatory water shade management	No	No	No	No	No	No	No	No
Fluoride content (mg/l) (**BOWR**, Water Action)		3.3	**2.56**	2.4	4.22, 2.42	**2.45**	1.61	**7**	**3.4**
Date of testing (EC)			**5/5/1997**		5/5/1997	**6/5/1997**		**4/5/1997**	**4/5/1997**
Construction cost									

Water scheme mapping 17-24

No.		17	18	19	20	21	22	23	24
Kebele		Gofessa	W/Gortancho	L/Arsho	Besheno	L/Lenda	Kulfo	Eloloqa	Gerema
Coordinates	E	38.13'268	38.01'617	38.00'172	38.13'751	38.08'073	38.09'544	38.04'366	38.01'961
	N	7.19'452	7.18'992	7.17'424	7.27'698	7.19'243	7.26'534	7.23'891	7.23'031
	Alt. (m.)	1,869	1,805	1,814	1,989	1,804	1,899	1,868	1,915
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		Health post	Mosque	Clinic	School			School	School
Physical characteristics		Plain	Plain	Plain	Plain	Plain	Plain	Mountainous	Plain
Year of construction (EC)		1995	1994	1995	1991	1997	1995	1997	1988
Installing organisation		ESRDF	PSAASCR	ESRDF	ADA	PINF	Water Action	Water Action	BoWR
Financer		Government	PSAASCR	Government	ADA	PINF	Water Action	Water Action	Government
Population served	Beginning								
	Currently								
No. HH									
Depth (m.)		329	150	84	320	254	220	195	194
Design population									
Technology		Motorised	Motorised	Motorised	Motorised	Motorised	Motorised	Motorised	Motorised
Water source		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
FN or NF?		FN	FN	FN	NF	NF	FN	FN	NF
Reason for NF					Pump failure	Pump head			Pump
How long NF (months)					8	18			4
Repaired past 12 months		Yes	Yes	Yes	No	No	No	No	No
Who does repair		Government	Government	Government					
Months breakdown to repair		1.5	6	3	Not yet	Not yet			Not yet
No. points		4	1	4	5	6	3	3	2
No. FN points		4	1	3	5	4	2	2	2
No. NF points		0	0	1	0	2	1	1	0
Reservoir	Quantity	1	1	1	2	3	1	1	1
	Capacity (m^3)	8	4	8	20	28	25	25	8
	Type	Steel	Concrete	Steel	Plastic	Steel	Concrete	Concrete	Steel
Reservoir status		FN	FN	Severe leakage	Severe leakage	FN	FN	FN	FN
Power source		Generator	Generator	Generator	Generator	Generator	Generator	Generator	Generator
Generator type		Deutz	Deutz		Deutz	Igeal	Lister Peter (TS3)	Lister Peter (TS3)	
Generator power		56KW	27.5KW				25.9KW		
Pump type		Submersible	Submersible	Submersible	Submersible	Submersible	Mono-lift	Mono-lift	Submersible
Pump property	Head (m)								
	Power (KVA)								
Discharge rate (l/sec.)		3	4.4	2.7	4.5	3.8	4	3	4.4
Reservoir head well covered		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scheme well fenced		No	No	No	No	No	No	Yes	No
Pipe system severely leaking		2	Yes	Yes	Yes	2	2	2	Yes
Scheme guard		Yes	Yes	Yes	Yes	Yes	Yes	Yes	2
Power house well constructed		Yes	2	Yes	Yes	Yes	Yes	Yes	Yes
WATSANCo office nearby		No	No	No	No	No	Yes	Yes	Yes
Water meter		No	No	Yes	Yes	Yes	Yes	Yes	Yes
Metal works corroded		No	No	No	No	No	No	No	No
Distribution pipeline leaking		Yes	Yes	Yes	No	Yes	No	Yes	Yes
No.		17	18	19	20	21	22	23	24
Kebele		Gofessa	W/Gortancho	L/Arsho	Besheno	L/Lenda	Kulfo	Eloloqa	Gerema
Water treatment plant		No	No	No	No	No	No	No	No

Irrigation activity using scheme		No	No	No	No	No	No	No	No
Latrines close to scheme		No	No	No	No	No	No	No	No
Close to settlement area		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scheme area flood prone		Yes	No	Yes	No	No	Yes	No	No
Cattle trough around scheme		Yes	Yes	Yes	Yes	Yes	No	No	No
Washing and bathing near		No	No	No	No	No	No	Yes	No
Landslide problems		No	No	No	No	No	No	No	No
Scheme close to water body		No	No	No	No	No	No	No	No
Contamination	Sediment from erosion	No	No	No	No	No	No	No	No
	Human faeces	No	No	No	No	No	No	No	No
	Animal faeces	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	Leaves, dust, etc	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Natural rock strata (e.g. fluoride)	Yes	No	No	Yes	No	Yes	Yes	No
Measures to limit pollution	Silt barrier or trap	No	No	Yes	Yes	Yes	No	No	Yes
	Polluting sources prevented	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
	Natural barriers constructed	No	No	Yes	Yes	Yes	Yes	No	Yes
	Chlorination	No	No	No	No	No	No	No	No
	Fencing	No	Yes	No	No	No	Yes	Yes	No
	Catchment control	No	Yes	Yes	No	No	Yes	No	Yes
	Prevention of discharge from chemical fertilisers	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
	Control behaviour that contributes to pollution	No	No	No	No	No	Yes	No	No
Nature of protection for source		0	25	0	25	0	0	25	0
Conservation of water source	Afforestation of catchment area	No	Yes	Yes	Yes	No	Yes	No	Yes
	Surface water recharge structures	No	Yes	Yes	Yes	No	Yes	No	Yes
	Diversion upstream or artificial recharge	No	No	No	No	No	No	No	No
	Participatory water shade management	No	Yes	No	Yes	No	Yes	No	Yes
Fluoride content (mg/l) (**BOWR**, Water Action)		**3.14**			**4.25**	**4.71**	4.6, 2.37	1.84	**2.35**
Date of testing (EC)		**4/5/1997**			**6/5/1997**	**10/5/1997**	6/5/1997		**6/5/1997**
Construction cost		808,909		668,433.32		1,060,000			

Water point mapping 1-10 (DBH = deep borehole)

No.		1	2	3	4	5	6	7	8	9	10
Code		11	12	13	14	15	21	22	31	32	41
Kebele		Debeso	Debeso	Debeso	Debeso	Debeso	Bendo	Bendo	Ajohulqo	Ajohulqo	Yatoberho
Coordinates	E	38.13'927	38.13'921	38.13'914	38.13'263	38.10'054	38.16'627	38.16'633	38.19'580	38.19'589	38.22'535
	N	7.16'938	7.16'938	7.16'938	7.17'101	7.17'099	7.29'867	7.29863	7.34'625	7.34'679	7.39'122
	Alt. (m.)	1,887	1,888	1,890	1,884	1,881	1,793	1,792	1,790	1,793	1,737
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		School	School	School	School	Clinic	-	-	-	-	School
Physical characteristics		Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain
No. points		1	2	3	4	5	1	2	1	2	1
Type		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
Year of construction (EC)		1966	1966	1998	1998	1991	1991	1991	1999	1999	1996
In use?		Yes	Yes	No	Yes	Yes	No	No	Yes	No	No
FN or NF		FN	FN	NF	FN	FN	FN	FN	FN	FN	FN
Reason for being dry				Scheme			Scheme	Scheme		Scheme	Scheme
No. faucets		6	6	1	6	40	6	6	4	4	6
No. FN faucets		6	2	0	3	0	4	5	3	4	6
No. NF faucets		0	4	1	3	40	2	1	1	0	0
Access to adequate safe water supply	Wet	50	50	25	50	40	0	0	75	75	25
	dry	25	50	25	50	55	0	0	100	100	25
Water predictability	Summer	25	25	25	25	25	0	0	25	50	25
	Non-summer	25	25	25	25	25	0	0	25	50	25
Water quality (user perception)		50	50	50	50	25	25	25	25	25	50
Fluoride symptoms among users		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stagnant water		30	40	0	25	0	25	25	50	50	50
Social barrier to access		100	100	0	100	0	100	100	100	100	100
Financial barrier to access?		No	No	No	No	No	No	No	No	No	No
Restriction on volume per HH?		No	No	No	No	No	No	No	No	No	No
System of user payment for O&M		25	25	25	25	25	25	25	25	25	25
Problem		5	2	1	1	7	1	1	3	3	2
Repaired over past 12 months		Yes	Yes	No	No	Yes	No	No	No	No	No
Who does the repair?		Government	Government			Government					
Days between breakdown & repair		5	Unknown	Not yet	Not yet	180					Not yet
Leakage		75	75	0	25	25	25	25	0	0	100

Water point mapping 11-20

No.		11	12	13	14	15	16	17	18	19	20
Code		42	43	44	51	52	61	71	72	81	91
Kebele		Yatoberho	Yatoberho	Yatoberho	Felqa	Felqa	U/Tuka	1st Tuka	1st Tuka	1st Ansha	Hamata
Coordinates	E	38.22'348	38.22'630	38.11'564	38.11'495	38.10'008	38.10'956	38.10'953	38.10'460	38.08'244	38.22'535
	N	7.38'466	7.39'806	7.15'927	7.15'870	7.25'064	7.22'109	7.22'123	7.19'174	7.20'423	7.39'122
	Alt. (m.)	1,726	1,741	1,873	1,872	1,958	1,920	1,926	1,871	1,823	1,737
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		-	-	-	School	-	-	-	-	Clinic	School
Physical characteristics		Plain	Plain	Plain	Plain	Plain	Mountainous	Plain	Plain	Plain	Plain
No. points		2	3	4	1	2	1	1	2	1	1
Type		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
Year of construction (EC)		1996	1996	1996	1997	1997	1996	1995	1995	1983	1995
In use?		No	No	No	No	No	Yes	Yes	Yes	No	Yes
FN or NF		FN	FN	FN	FN	FN	FN	FN	FN	FN	FN
Reason for being dry		Scheme	Scheme	Scheme	Scheme	Scheme				Scheme	
No. faucets		2	6	6	4	4	6	6	6	8	4
No. FN faucets		2	6	6	3	4	2	6	3	8	4
No. NF faucets		0	0	0	1	0	4	0	3	0	0
Access to adequate safe water supply	Wet	25	25	0	0	0	25	0	0	25	25
	dry	25	25	0	0	0	0	0	0	25	25
Water predictability	Summer	25	25	25	25	25	25	25	25	75	25
	Non-summer	25	25	25	25	25	25	25	25	75	25
Water quality (user perception)		50	50	50	50	50	50	50	50	50	50
Fluoride symptoms among users		Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Stagnant water		50	50	50	50	50	50	50	50	50	50
Social barrier to access		0	100	100	100	100	100	100	100	100	100
Financial barrier to access?		No	No	No	No	No	No	No	No	No	No
Restriction on volume per HH?		No	No	No	No	No	No	No	No	No	No
System of user payment for O&M		50	25	25	25	25	25	25	25	25	25
Problem		2	1	1	1	1	1	1	1	1	1
Repaired over past 12 months		No	No	No	No	No	No	No	Yes	No	No
Who does the repair?									Government		
Days between breakdown & repair								Not yet	Unknown		
Leakage		100	100	100	75	75	25	25	25	100	100

Water point mapping 21-30

No.		21	22	23	24	25	26	27	28	29	30
Code		92	101	102	111	112	113	114	121	122	123
Kebele		Hamata	1st Meqala	1st Meqala	2nd Meqala	2nd Meqala	2nd Meqala	2nd Meqala	Ashoca	Ashoca	Ashoca
Coordinates	E	38.08'122	38.06'659	38.06'667	38.08'822	38.08'833	38.08'833	38.08'818	38.07'828	38.07'820	38.07'786
	N	7.20'241	7.17'166	7.17'177	7.16'209	7.16'173	7.16'146	7.16'117	7.14'770	7.14'738	7.14'724
	Alt. (m.)	1,817	1,765	1,756	1,794	1,792	1,791	1,792	1,751	1,749	1,751
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		-	-	-	-	-	-	-	-	-	-
Physical characteristics		Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain
No. points		2	1	2	1	2	3	4	1	2	3
Type		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
Year of construction (EC)		1995	1998	1978	1993	1993	1993	1993	1994	1994	1994
In use?		No	Yes	No	No	No	No	No	No	No	No
FN or NF		FN	FN	FN	FN	FN	NF	NF	FN	FN	FN
Reason for being dry				Other	Scheme	Scheme	Scheme	Scheme	Scheme	Scheme	Scheme
No. faucets		4	6	4	4	4	4	4	4	4	4
No. FN faucets		4	4	2	4	4	1	0	4	4	4
No. NF faucets		0	2	2	0	0	3	4	0	0	0
Access to adequate safe water supply	Wet	25	75	25	25	25	25	25	25	25	25
	dry	25	50	25	25	25	25	25	25	25	25
Water predictability	Summer	75	50	100	0	0	0	0	75	75	75
	Non-summer	75	50	100	0	0	0	0	75	75	25
Water quality (user perception)		50	50	50	50	50	50	50	50	50	50
Fluoride symptoms among users		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stagnant water		50	25	25	50	50	0	50	50	50	50
Social barrier to access		100	100	100	100	100	100	100	100	100	100
Financial barrier to access?		No	No	No	No	No	No	No	No	No	No
Restriction on volume per HH?		No	No	No	No	No	No	No	No	No	No
System of user payment for O&M		25	25	25	25	25	25	25	25	25	25
Problem		3	1	7	1	1	7	1	1	1	1
Repaired over past 12 months		No	No	No	No	No	No	No	No	No	No
Who does the repair?											
Days between breakdown & repair							Not yet				
Leakage		100	75	100	100	100	0	0	100	100	100

Water point mapping 31-40

No.		31	32	33	34	35	36	37	38	39	40
Code		124	131	132	133	134	135	141	142	143	144
Kebele		Ashoca	1st Choroqo	1st Choroqo	1st Choroqo	1st Choroqo	1st Choroqo	Alem Tena	Alem Tena	Alem Tena	Habibo
Coordinates	E	38.07'770	38.06'217	38.06'255	38.06'283	38.06'174	38.06'101	38.06'872	38.06'824	38.06'763	38.06'516
	N	7.14'687	7.19'984	7.20'013	7.20'068	7.20'017	7.19'976	7.21'801	7.21'716	7.22'266	7.22'614
	Alt. (m.)	1,752	1,787	1,789	1,789	1,787	1,793	1,798	1,793	1,794	1,792
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		-	School	School	School	School	School	School	School	School	-
Physical characteristics		Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain
No. points		4	1	2	3	4	5	1	2	3	4
Type		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
Year of construction (EC)		1994	1996	1996	1996	1996	2000	1996	1996	1996	1996
In use?		No	Yes	No	No	Yes	No	No	No	No	No
FN or NF		FN	FN	FN	FN	FN	NF	FN	FN	FN	FN
Reason for being dry		Scheme		Other	Other		Other	Scheme	Scheme	Scheme	Scheme
No. faucets		4	4	4	4	4	4	4	4	4	4
No. FN faucets		3	3	3	4	4	4	4	2	4	4
No. NF faucets		1	1	1	0	0	0	0	2	0	0
Access to adequate safe water supply	Wet	25	100	25	25	100		0	0	0	0
	dry	25	100	25	25	100		0	0	0	0
Water predictability	Summer	75	75	25	25	75		77	75	75	0
	Non-summer	75	75	25	25	75		75	75	75	0
Water quality (user perception)		50	50	50	50	50		50	50	50	50
Fluoride symptoms among users		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Stagnant water		50	50	0	0	50		50	50	50	50
Social barrier to access		100	100	100	100	100		100	100	100	100
Financial barrier to access?		No	No	No	No	No		No	No	No	No
Restriction on volume per HH?		No	No	No	No	No		No	No	No	No
System of user payment for O&M		25	25	25	25	25		25	25	25	25
Problem		1	1	3	3	1		1	1	1	1
Repaired over past 12 months		No	No	No	No	No	No	No	No	No	No
Who does the repair?											
Days between breakdown & repair					Not yet						
Leakage		100	100	50	100	25		100	100	100	100

Water point mapping 41-50

No.		41	42	43	44	45	46	47	48	49	50
Code		151	152	161	162	171	172	173	181	191	192
Kebele		Qobochobare	Qobochobare	Roqanene Tefo	Roqanene Tefo	Gofessa	Gofessa	Gofessa	W/Gortancho	L/Arsho	L/Arsho
Coordinates	E	38.17'010	38.17'009	38.15'292	38.15'295	38.13'867	38.13'568	38.13'186	38.01'642	38.00'388	38.00'185
	N	7.23'826	7.23'832	7.21'205	7.21'196	7.19'498	7.19'344	7.19'554	7.19'010	7.17'684	7.17'474
	Alt. (m.)	1,797	1,797	1,839	1,838	1,859	1,865	1,872	1,803	1,813	1,817
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		-	-	-	-	Health post	Mosque	-	Mosque	Clinic	-
Physical characteristics		Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain
No. points		1	2	1	2	1	2	3	1	1	2
Type		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
Year of construction (EC)		1997	1978	1978	1997	1995	1995	1995	1995	1995	1995
In use?		Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes
FN or NF		FN	FN	NF	NF	FN	FN	FN	FN	FN	FN
Reason for being dry				Scheme	Scheme		Point				
No. faucets		8	4	6	7	6	6	6	8	6	6
No. FN faucets		5	3	0	0	5	6	6	3	6	2
No. NF faucets		3	1	6	7	1	0	0	5	0	4
Access to adequate safe water supply	Wet	50	40	25	25	25	25	40	40	0	40
	dry	50	40	25	25	25	25	40	40	0	40
Water predictability	Summer	25	50	75	75	25	50	50	40	75	50
	Non-summer	25	50	75	75	25	50	50	50	75	50
Water quality (user perception)		50	50	50	50	50	50	50	50	50	50
Fluoride symptoms among users		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stagnant water		0	0	25	0	50	0	25	50	25	50
Social barrier to access		100	100	100	100	100	100	100	100	100	100
Financial barrier to access?		No	No	No	No	No	No	No	No	No	No
Restriction on volume per HH?		No	No	No	No	No	No	No	No	No	No
System of user payment for O&M		25	25	25	25	25	25	25	25	25	25
Problem		1	1	2	1	1	1	2	1	1	2
Repaired over past 12 months		Yes	Yes	Yes	No	Yes	No	No	No	Yes	No
Who does the repair?		Government	Government	Government		Government				Government	
Days between breakdown & repair		7	8	90	Not yet	15				15	
Leakage		50	50	0	0	75	100	100	50	100	100

Water point mapping 51-60

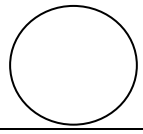
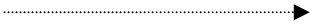
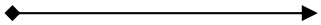
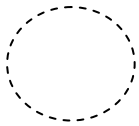
No.		51	52	53	52	55	56	57	58	59	60
Code		193	194	201	202	203	204	205	211	212	213
Kebele		L/Arsho	U/Arsho	Besheno	Besheno	Besheno	Besheno	Besheno	L/Lenda	Gedeba	Qufe
Coordinates	E	38.00'095	37.59'940	38.13'896	38.13'838	38.13'644	38.13'886	38.13'737	38.08'087	38.08'733	38.09'561
	N	7.17'898	7.18'330	7.28'352	7.28'239	7.27'989	7.28'043	7.27'700	7.19'273	7.18'698	7.18'049
	Alt. (m.)	1,820	1,835	1981?	1,978	1,988	1,972	1,987	1,803	1,807	1,826
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		-	Clinic	Clinic	Clinic	School	-	-	-	-	School
Physical characteristics		Plain	Plain	Mountainous	Mountainous	Mountainous	Mountainous	Plain	Plain	Plain	Plain
No. points		3	4	1	2	3	4	5	1	2	3
Type		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
Year of construction (EC)		1995	1995	1998	1998	1998	1997	1991	1997	1997	1997
In use?		No	Yes	No	No	No	No	No	No	No	No
FN or NF		NF	FN	FN	FN	FN	FN	FN	FN	FN	NF
Reason for being dry		Point		Scheme	Scheme	Scheme	Scheme	Scheme	Scheme	Scheme	Scheme
No. faucets		6	6	1	8	1	6	14	6	6	6
No. FN faucets		6	1	1	4	1	5	11	5	2	0
No. NF faucets		0	5	0	4	0	1	3	1	4	6
Access to adequate safe water supply	Wet	25	0	25	0	0	25	12	25	25	0
	dry	25	0	25	0	25	25	25	25	25	0
Water predictability	Summer	0	25	25	25	25	25	25	50	50	25
	Non-summer	0	25	25	25	25	25	25	50	50	25
Water quality (user perception)		25	50	50	50	50	50	50	50	50	50
Fluoride symptoms among users		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stagnant water		50	25	50	50	50	50	50	25	50	50
Social barrier to access		100	100	25	100	25	100	100	100	100	100
Financial barrier to access?		No	No	No	No	No	No	No	No	No	No
Restriction on volume per HH?		No	No	No	No	No	No	No	No	No	No
System of user payment for O&M		25	25	25	25	25	25	25	25	25	25
Problem		1	1	1	1	1	1	1	2	1	1
Repaired over past 12 months		No	No	No	No	No	No	No	No	No	No
Who does the repair?											
Days between breakdown & repair											
Leakage		100	0	100	75	75	100	75	50	50	25

Water point mapping 61-71

No.		61	62	63	64	65	66	67	68	69	70	71
Code		214	215	216	221	222	223	231	232	233	241	242
Kebele		Gedeba	Qufe	U/Lenda	Kulfo	Kulfo	Kulfo	Eloloqa	Eloloqa	Eloloqa	Gerema	Gerema
Coordinates	E	38.08'012	38.09'757	38.09'179	38.09'575	38.09'603	38.09'573	38.04'288	38.04'591	38.04'485	38.02'083	38.02'097
	N	7.18'749	7.17'801	7.18'606	7.26'533	7.26'511	7.26'494	7.23'885	7.23'924	7.23'945	7.22'767	7.22'775
	Alt. (m.)	1,801	1,826	1,826	1,897	1,896	1,896	1,867	1,867	1,870	1,917	1,915
Climate		Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega	Woina dega
Nearby institution		-	Mosque	-	-	-	-	School	School	-	School	School
Physical characteristics		Plain	Plain	Plain	Plain	Mountainous	Plain	Mountainous	Mountainous	Mountainous	Mountainous	Mountainous
No. points		4	5	6	1	2	3	1	2	3	1	2
Type		DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH	DBH
Year of construction (EC)		1997	1997	1997	1995	1995	1995	1997	1997	1997	1988	1998
In use?		No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No
FN or NF		FN	NF	FN	FN	FN	FN	FN	FN	NF	FN	FN
Reason for being dry		Scheme	Scheme	Scheme						Point	Scheme	Scheme
No. faucets		6	6	6	4	4	4	4	4	4	6	1
No. FN faucets		6	6	6	4	2	4	4	4	2	5	1
No. NF faucets		0	0	0	0	2	0	0	0	2	1	0
Access to adequate safe water supply	Wet	0	0	0	25	0	0	0	0	25	25	25
	dry	0	0	0	25	0	25	0	0	40	25	25
Water predictability	Summer	0	0	0	50	25	25	25	25	25	50	25
	Non-summer	0	0	0	50	25	25	25	25	25	50	25
Water quality (user perception)		50	50	50	50	50	50	50	50	50	50	50
Fluoride symptoms among users		Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stagnant water		50	50	50	50	50	50	50	50	50	25	25
Social barrier to access		100	100	100	100	100	100	100	100	100	100	100
Financial barrier to access?		No	No	No	No	No	No	No	No	No	No	Yes
Restriction on volume per HH?		No	No	No	No	No	No	No	No	No	No	Yes
System of user payment for O&M		25	25	25	25	25	25	25	25	25	25	25
Problem		1	1	1	1	2	1	1	1	1	1	1
Repaired over past 12 months		No	No	No	No	No	No	No	Yes	No	No	No
Who does the repair?									NGO			
Days between breakdown & repair									60	Not yet		
Leakage		75	75	75	100	75	100	100	100	100	100	100

Annex 3:Visual leadership and coordination model

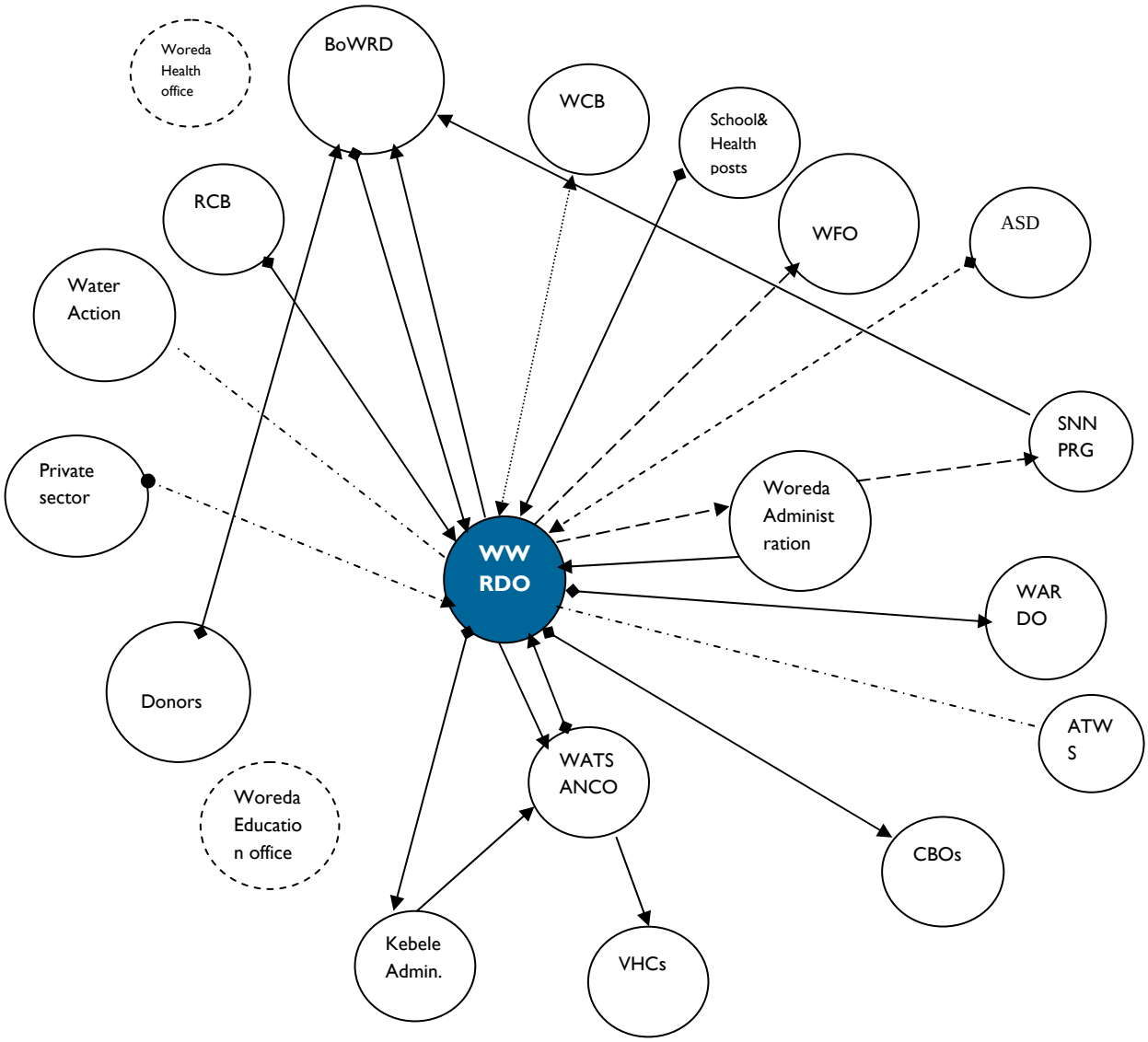
The followings are perceptions of individual LPA members who belong to the organizations and may not necessarily reflect positions of the organizations.

Influence/importance Size of the circle represents the strengths of importance/influence	
Mutual dependency	
Control	
Reporting	
Exchange in information	
Support/ Dependence	
Weak relationship	
Absence of relationship	

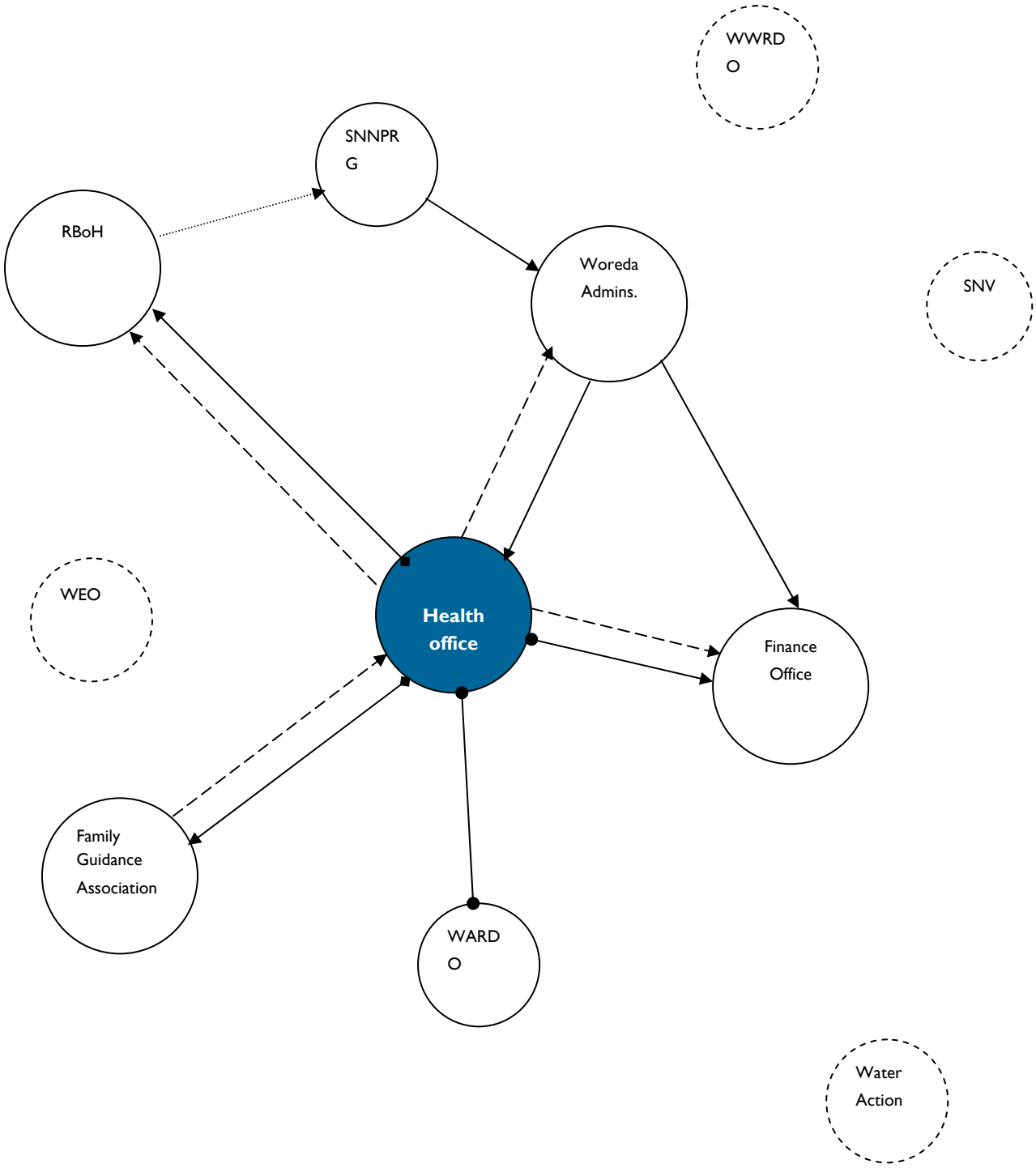
List of Abbreviations

ADA	Alaba Development Association
ATWS	Alaba Town Water Service
AWCB	Alaba Woreda Capacity Building
BoFED	Bureau of Finance and Economic Development
BoWRD	Bureau of Water Resource Development
CBOs	Community Based Organizations
RGCB	Regional Capacity Building
SNNPRG	Southern Nations Nationalities People Regional Government
VHCs	Volunteer Health Communicators
WFO	Woreda Finance Office
WRO	Woreda Revenue Office
WSATSANCO	Water Supply and Sanitation Committee
WWRDO	Woreda Water Resource Development Office

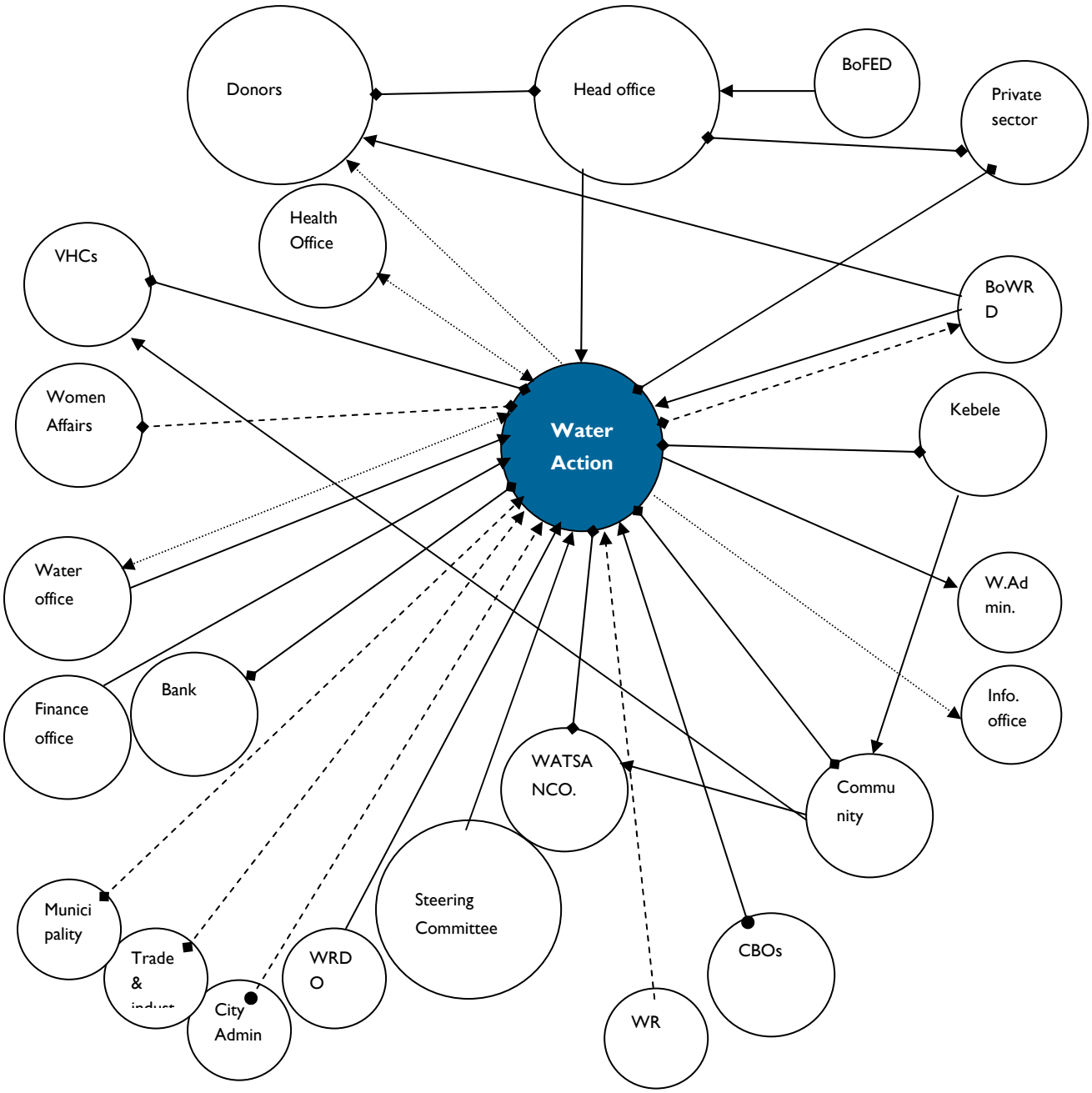
WWRDO


Woreda Health office
BoWRD
WCB
School& Health posts
RCB
WFO
ASD
Water Action
SNN PRG
Private sector
Woreda Administ ration
WW RDO
WAR DO
Donors
ATW S
WATS ANCO
Woreda Educatio n office
CBOs
Kebele Admin.
VHCs

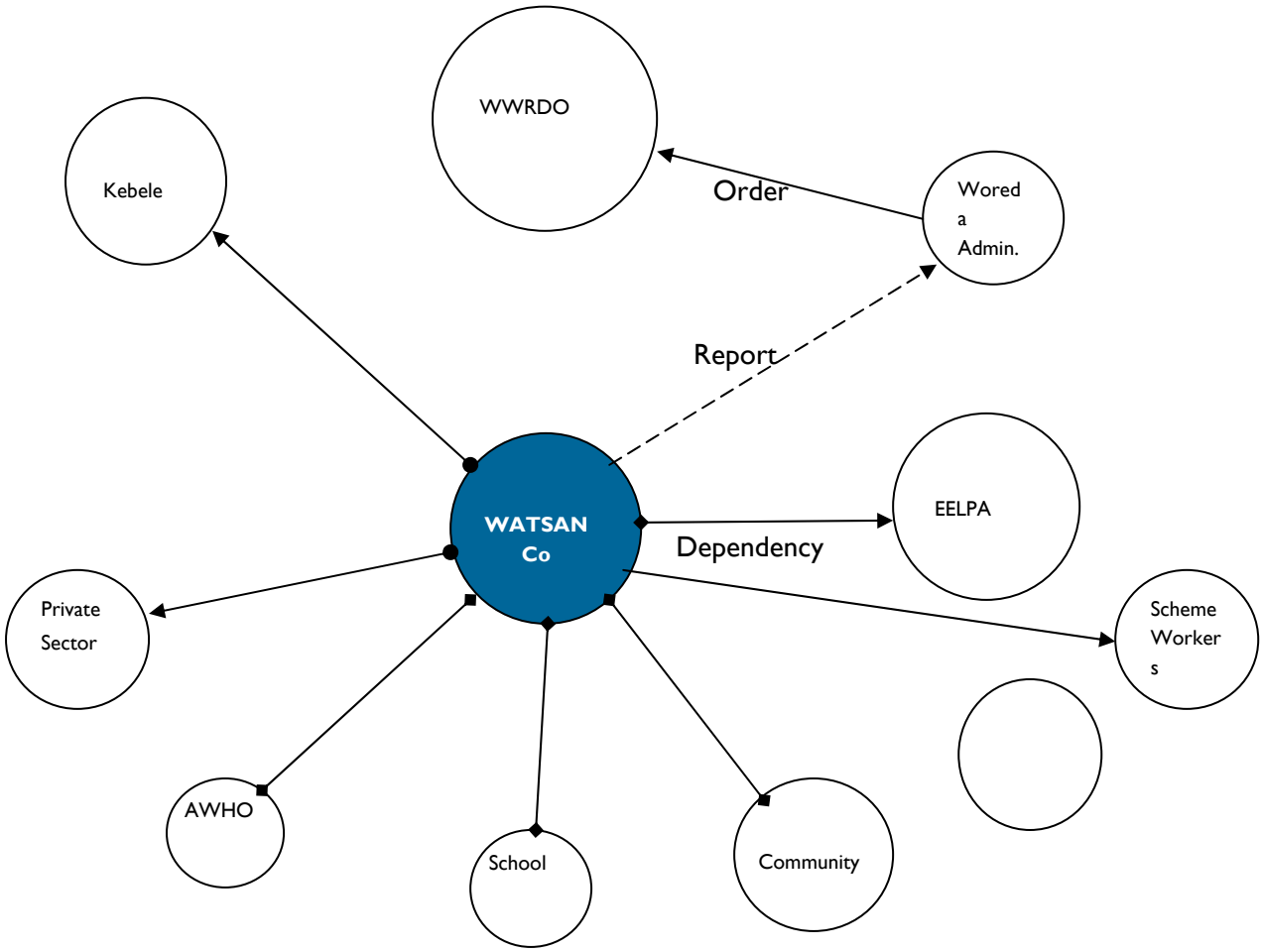
Woreda Health Office



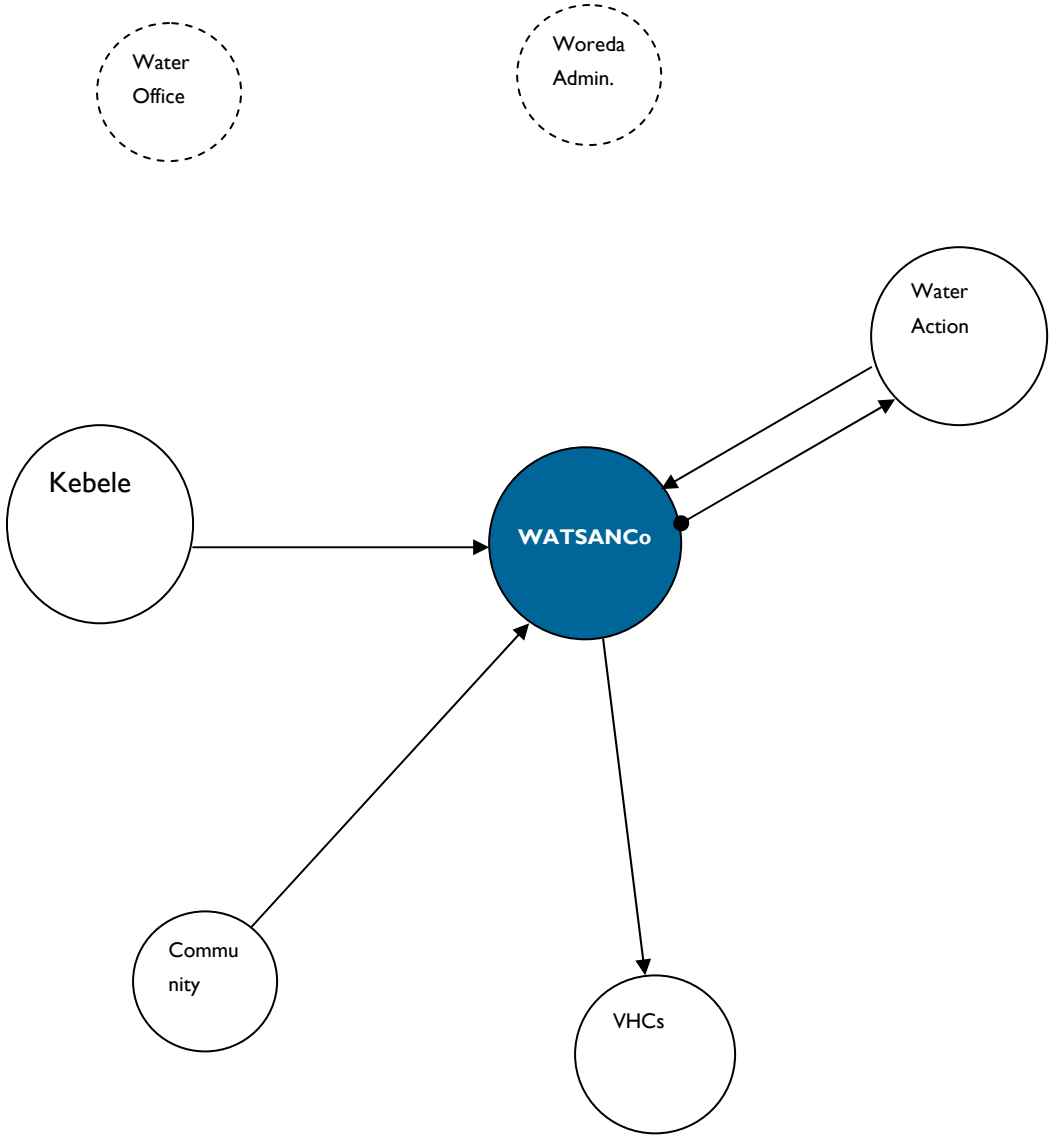
Water Action



Debeso WATSANCO



Ashoka WATSANCO



Woreda Administration