WITH FUNDING FROM
AUSTRIAN DEVELOPMENT COOPERATION

Water Source Sites Assessment Report

For

Water for Food Security, Women's Empowerment and Environmental Protection (SWEEP) Project in East and West Belesa Woredas of Central Gonder Zone, Amhara Regional State

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Summary

CARE Ethiopia, with the support of the Austrian Development Agency (ADA), with funds from the Austrian Development Cooperation (ADC), is implementing the water for food security, women empowerment and environmental protection (SWEEP) project in East and West Belesa of central Gondar of Amhara regional state. The objective of the project is to ensure the food security of chronically food insecure households in East and West Belesa by providing access to water resources for domestic and productive use, empowering marginalized rural women and girls, people with disabilities and unemployed youth, as well as protecting the environment and strengthening governance at different level.

To achieve the project objectives, CARE Ethiopia in collaboration with the woreda water office experts conducted a water sources site assessment to identify potential sites for construction of water supply schemes and identify schemes that need rehabilitation works.

Methods/approaches

Based on the national water supply implementation guideline and on the project's demand-driven approach, every demand on access to water should be raised from the community and the community should engage in every step of the process from planning to post management of the schemes. Therefore, demand request formats were distributed to the wider community in the intervention kebeles and were analyzed by the woreda water office experts together with CARE staff. After having analyzed the results, a water sources site assessment was conducted to identify potential sites for construction of new water schemes. With regards to the rehabilitation of water source sites, woreda water experts reviewed the list of non-functional water schemes, investigated the level of damage at hand and listed items that have to be replaced.

Findings

New water sources site assessment: the demand request appraisal took social, technical and environmental factors into consideration. Some of the factors included community willingness to contribute to the construction work and to the management of the schemes after construction; the extent of the problems at hand and regarding domestic use in particular; general suitability and potential of the proposed sources; and environmental suitability of the proposed site. Taking into consideration all those factors, 40 new sites (20 in each woreda) were selected for further development. Selected sites were mostly suitable for hand-dug wells with some spring source from East Belesa.

Rehabilitation of existing water supply: based on the extent of damage and the material requirement identified by the project staffs in collaboration with government staffs, it was decided that 50 water schemes will be rehabilitated by the project (30 in West Belesa, 20 in East Belesa).

Conclusion

Through this participatory water sources site assessment 90 schemes in total were identified to be rehabilitated (50) and newly constructed (40). The construction and rehabilitation will take place during dry weather conditions. Before the construction and rehabilitation of the water schemes, the following will be taken into consideration:

- Conduction of an environmental impact assessment and identification of mitigation measures;
- Involvement of the community in the construction and rehabilitation of water schemes.
- Close supervision of the constructed/rehabilitated water schemes by government authorities and CARE.

Introduction

CARE, through the support of the Austrian Development Agency (ADA), with funds from the Austrian Development Cooperation (ADC), is implementing the Water for Food Security, Women Empowerment and Environmental Protection (SWEEP) project. The objective is to increase food security in East and West Belesa through providing access to water for productive and domestic use, empowering marginalized groups, and strengthening environmental protection and governance. The project conducted a water sources site assessment to identify the potential sites for new construction and rehabilitation.

Methods/Approaches

The water sources site assessment was conducted from November 2017 until February 2018 in 20 kebeles of East and West Belesa by CARE staff and woreda water office experts. The project intervention kebeles were selected by the woreda steering committee which took its decision based on current water supply coverage, potential, accessibility, situation of adjacent kebeles[1] and possibility of overlapping[2].

Moreover, the *One WASH* national implementation guideline[3] explicitly requires development/Government actors to use a demand-driven and participatory approach for any community water supply development work- therefore, SWEEP followed this requirement as well for this assessment.

[1] Adjacent kebele _ close kebele. This is important to reduce the overhead cost.

2 Overlapping: kebeles in which other similar projects have the same objective. This helps reduce duplication of resources.

3 www.open.edu/openlearncreate/.../1/Ethiopias_One_WASH_National_Programme.pdf

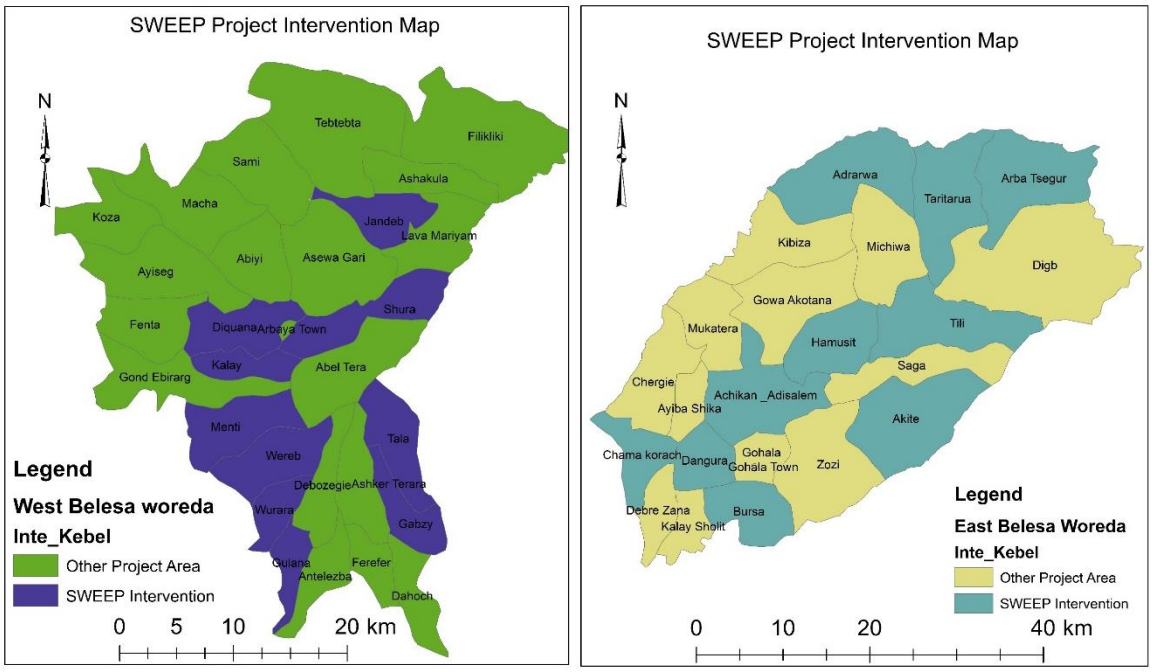

Figure 1 Project intervention and water sources site assessment areas of West and East Belesa in 2018

Findings

1. New water sources site assessment

For the identification of new water schemes, CARE first conducted a desk appraisal. It distributed 100 demand-request forms to the communities. 50% responded within the given schedule and deadline. The objective of the request was to (i) understand the level of the communities' needs and to (ii) assess their willingness to actively participate in all steps of the implementation cycle; (iii) assess the number of users for each scheme. Using the results of the demand-request forms, the appraisal team made an initial selection of sites taking into consideration the following criteria:

1. **Number of beneficiaries**: - this is important as it takes into consideration cost efficiency and effectiveness, and the number of people served per scheme may also significantly increase the communities' contribution per scheme, which would improve future management. Furthermore, the team took necessary precaution not to have more people beyond the water sources' capacity.

2. **Condition and distance of existing water source**: this considers quality and quantity of water available and its average distance from the user's village. These are the some of the main areas the project wants to have an impact on: making water accessible and meeting quality standards. The communities currently travel long hours – especially women and girls- and have limited access to sufficient quantity of water and quality.

3. **Beneficiary participation in project and WASH committee selection:** the main evaluating criteria included (i) number of people who participated during need-identification meeting; (ii) availability of bylaws; (iii) committee establishment and composition (male/female).

4. **Beneficiary contribution:** - magnitude of community contribution in kind and/or in cash considered also as an important criteria.

Based on the results of the desk appraisal, a field level evaluation was conducted. The objective was to evaluate/validate the desk level appraisal and technically evaluate the potential of the given implementation areas. The team confirmed the number of beneficiaries indicated in the demand-request and checked if the minimum requirements for rural water supply - such as maximum distance to the source, sufficiency of water yield for proposed beneficiaries and water quality (physical and biological / protected, unprotected) - are fulfilled or not. The team also closely assessed the hydrogeological and physical conditions of the watershed for selected water points.

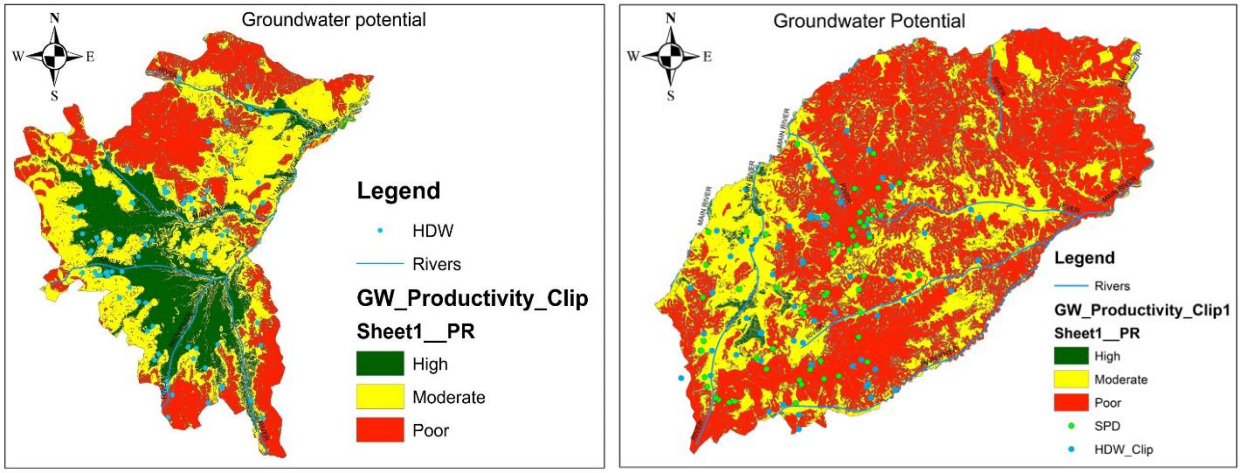

Figure 2 Groundwater potential, streams and distribution of existing water schemes map in (left) West and (right) East Belesa

Geological formation: to investigate the geological formation of the proposed sites, the technical team observed and classified the geological formation by collecting strata formation from existing nearby wells, gullies, and riverbanks. Both surface and subsurface investigation were employed to evaluate the geological formation. Appropriate wells will have to be located in fractured and weathered rocks that can be diggable by hand.

Vegetation patterns: vegetation growing pattern is a relevant indicator to evaluate the groundwater table. Mostly if there is a weak lineament or fractured area with certain orientation, vegetation will grow along the weak zone (straight-line vegetation pattern). This indicates that there will be a good aquifer along the fractured zone, which leads to the conclusion that hand dug wells along the weak zone, is promising. Additionally, perennial plants are the most useful indicators of ground water. For the assessment, the team critically observed the vegetation pattern of the watershed to locate the well sites. The wells selected will be built next to vegetables with short and narrow leaves or very thick flesh leaves with thick cell wall.

Overall sanitary condition: groundwater may become contaminated due to improper disposal of liquid wastes, defective well construction and failure to seal abandoned wells. These provide possible openings for the downward movement of water into sub-surface formation without natural filtration. Contamination may also take place through movement of wastewater through large openings such as animal burrows, coarse gravel formation or manmade excavation. Another increasing source for pollution nowadays is the use of fertilizers. During the site selection a sanitary survey was undertaken to evaluate the water quality and the results showed that all of the water schemes are currently safe from potential sources of contamination.

Environmental impact assessment: considering the possible impacts the construction of schemes can have on the environment, the following risks were considered when selecting the sites: flood occurrence after constructing new structures, deforestation of indigenous plants around the selected sites, possibility of gulley formation due to diversion of incoming floods, impact on ecosystems due to capping of water.

Risk Types	Number of schemes to be affected by risk	Proposed mitigation measure
Flooding	5 hand dug wells and two springs located near to flood areas	Construction of flood protection walls and diversion ditch to collect water and safely remove to natural drainage systems
Gulley formation	5 hand dug wells and 2 springs	Construct proper drainage ditches and water ways to remove excess water.

Table 1 Risks, number of water schemes possibly affected by risks and mitigation measure

2. Selection of rehabilitation of water schemes

Detailed assessments (water inventory) were done looking at the reasons of non-functionality, including poor construction (problem related to construction quality, construction material quality), poor management (problem related to management of schemes like lack of maintenance budget, lack of preventive and minor maintenance, improper management of schemes like fencing, fetching time, impact on children etc…), natural hazards (problem related to landslides, flooding) and shortage of water (when production of wells /springs did not meet the requirements of the communities).

A selection of nonfunctional schemes was made based on a detailed cost analysis (analysis of required materials needed for rehabilitation). A bill of quantity for each scheme was prepared and the total costs for rehabilitation ranged from 10,000-15,600 ETB.

The selection also took other factors into consideration such as:

Cost benefit: the number of beneficiaries accessing the water scheme was important to evaluate the cost benefit of the rehabilitation exercise. It was agreed that all of the proposed costs for rehabilitation (and construction of new schemes) should not exceed 373 ETB/beneficiary.

Management capacity: operation and maintenance cost of rural water supply should be covered by the communities themselves. As a result, CARE calculated that at least 25 households should be assigned per scheme to ensure that the costs can be covered in the long term.

Conclusion

The intervention kebeles are characterized by low water coverage, low potential of surface and groundwater and easy accessibility to construction materials. Furthermore, there are currently no other project interventions in the area who plan to construct or rehabilitate water schemes in the selected kebeles. Hence, based on the desk appraisal and field level evaluation of the potential water source, CARE concluded that a total of 40 new water sources (31 sites for hand dug wells and 9 sites for spring development) could be constructed and 50 non-functional schemes could be rehabilitated (35 hand dug wells and 15 spot springs). From the selected schemes all the springs will be located in East Belesa.

Woreda	New Hand dug wells	New spring development	Rehabilitation of hand dug wells	Rehabilitation of spot spring	Total
East Belesa	12	8	20	15	55
West Belesa	20	0	15	0	35
Total	32	8	35	15	90

Table 2: Number of schemes selected for rehabilitation and new construction for SWEEP project in East and West Belesa in 2018

Annex 1 sanitary survey

1. GENERAL CONSIDERATIONS.

1.1 Zone_____ 1.2. Woreda_____

1.3 Kebele_____ 1.4. Gott_____

2. Do potential sources of contamination exist	Yes	No
a) above the site or in the watershed?	_____	_____
b) at the site?	_____	_____

If yes, determine these sources and

a) remove sources of contamination, and/or
b) protect the water supply, or
c) find a more acceptable water supply,

3. Does the water source have unpleasant physical qualities such as.	Yes	No
a) color?	____	____
b) unpleasant odor?	____	____
c) taste?	____	

_____

Annex 2: Water Point Site Selection Report/ Sitting Report Formats

1. GENERAL CONSIDERATIONS.

1.1 Zone_____ 1.2. Woreda_____

1.3 Kebele_____ 1.4. Gott_____

1.5 Location of the community from the woreda capital (how to get there) _____

1.6 Total number of beneficiaries with in 1km_____, Male_____, Female_____

2. TOPORGAPHICAL LOCATION OF THE VILLAGE.

A. In a valley B. On a ridge C. On a plain.

3. CLIMATE.

A. Dega B. Wayne dega C. Kola.

Name of the months of wet seasons_____

Name of the months of dry seasons_____

4. SANITATION.

4.1 Main water borne/related diseases in the area_____

4.2 What measures did the community take to alleviate the above mentioned diseases?

_____

_____

5. EXISTING WATER SUPPLY SYSTEM

Type of water source _____

Average distance from the community_____

Adequacy of the water _____

Reliability of the source_____

Quality of water _____

Accessibility of the source_____

Problems with the existing water supply systems _____.

6. RECOMMENDED WATER SOURCE

Hand dug well_____, Spring_____

Remarks on the recommended water source _____

_____

_____

7. SKETCH OF THE VILLAGE

In this sketch the following should be included a) roads in the village, b) settlement patterns (location of houses), c) location of existing source and d) location of the proposed source with respect to the settlements and other important features.

Annex 3: Environmental impact check list

1) Genarl information.

1.1 Zone_____ 1.2. Woreda_____

1.3 Kebele_____ 1.4. Gott_____

2) is there an indigenous plant around the proposed schemes? Yes No
3) Does it need deforestation of indigenous plant for construction? Yes No
4) If the answer is yes, Your reason for site selection
5) List watershed intervention to be implemented in the upstream and downstream of watershed _____
   _____
6) Will have possible occurrence hazards due to construction or rehabilitation of schemes
7) what are the main hazards and degradation features such as gullies, areas affected by flooding or landslides or sedimentation (Approx. within 50 m radius)
8) List degradation features that might not pose a threat to the water point right now, but if untreated might be a hazard in future (e.g. cattle tracks developing into a gully, etc.)
9) Is there gully in the proposed site? Yes No
10) Where it located? Up slope Down slope
11) When it will be treated? Before construction During construction After construction
12) State mitigation measure _____
    _____
    _____
    _____