

ETHIOPIAN CATHOLIC CHURCH

SOCIAL and

DEVELOPMENT COMMISSION BRANCH OFFICE OF MEKI



Tuch Denbel Water Quality Improve Project

January 10th, 2019

Meki

1. PROJECT PROFILE

Project Title: Tuch Denbel Water quality improve project

General Goal: To improve water quality issue

Duration of the Project: January 1st, 2019 to June, 30th, 2019

Time of Commencement: January 2019

Area of Operation: Ethiopia, Oromia Regional State, East Shewa, Dugda,

Kebeles: Tuch Denbel

Total population of Tuch Denbel is: (8000 people, 4,080 Female & 3,920 male)

Type and number of project beneficiary: 475 households (2,375 populations)

Implementing Agency: Ethiopia Catholic Church Social and Development Commission
Branch Office of Meki (ECC-SDCBOM)

Project Budget Birr: 1,509,360

Budget category	Total	Budget share
I. Direct Project cost	1,353,360.00	90%
II. Administrative cost	156,000.00	10%
Total	1,509,360	100%

Figure 0-1 Summary of Budget

Donor: Acqua per la vita” and “Ampelos” -Italian Charitable Associations

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1. Introduction

Fluoride in drinking water is beneficial at low concentrations but is considered harmful for the human health when present at concentrations exceeding 1.5 mg/L.

Prevalence of high concentration of fluoride in drinking water, combined with the non-availability of alternate viable sources, makes the treatment of the contaminated water an essential task. In this project, we intended to construct the synthesis and characterization of a hybrid adsorbent; hydroxyapatite- modified activated alumina (HAP) prepared by dispersing nanoparticles of hydroxyapatite inside activated alumina granules. The composite adsorbent provided a synergy toward fluoride removal from contaminated drinking water. The hybrid adsorbent possesses a maximum adsorption capacity of 14.4 mg F/g which is at least five times higher than the virgin-activated alumina, which has been used extensively for fluoride removal. The adsorbent was subjected to multiple numbers of operating cycles within a column, each cycle consisting of one adsorption run followed by regeneration. The regeneration cost will be accommodated by user communities.

Groundwater remains the only choice in many developed as well as developing countries such as Ethiopia for fulfilling the daily needs and demands of people. But unfortunately, due to weathering of rocks and over-exploitation, there is leaching of minerals in the groundwater that usually results in the release of extra dissolved species into the groundwater. Arsenic and fluoride are known to be major geo-genic pollutants that cause adverse effects on human health. Although fluoride contamination in the drinking water is not as fatal as arsenic; however, the widespread nature and debilitating effect on the human beings have made the fluoride contamination problem as the one which needs to be urgently remediated. Different publication shows that One-fourth countries of the world and a large fraction (28 %) of rural population of the developing countries (India, Pakistan, Bangladesh, Ethiopia, etc.) are facing the problems of water supply with unsafe level of fluoride, resulting in a condition which demands an immediate and robust solution. High fluoride concentrations in groundwater, up to more than 15 mg/L, have been observed widely in many kebele of Dugda District. Tuch Denbel PA is one among the rural kebele of the district. Water quality test at different time showed that Tuch Dembel water supply scheme has impermissible levels of fluoride even in Ethiopian context which is 3mg/

1. Executive summary

This project is going to be implemented in Oromia Regional state, East Showa Zone, Dugda District Tuch Denbel kebele. Ethiopian Catholic Church Social & Development Commission Branch Office of Meki (ECC-SDCBOM) has a long term experience in enhancing domestic water supply developments.

The primary goal of this project is to assure water quality for Tuch Dembel domestic water supply scheme.

The project is granted by “Acqua per la vita” and “Ampelos”- Italian Charitable Associations and implemented by well experienced organization, ECC-SDCBOM. WASH team will take the lion share in project activities design and implementation.

In this project 13 peoples will be expected to be directly benefited from project through obtaining different technical training in scheme management, scheme operation and scheme fee collecting (WASH-co, Caretaker and operator).

The total budget of the project will be **1,509,360** from which 1,450,360 will be granted by “Acqua per la vita” and “Ampelos”- Italian Charitable Associations Ethiopia while the remains 59,000 will be shared by user communities for facilitation of minor maintenance activities.

The project implementation will be commenced in January 1st /2019 and terminated in June 30st / 2019.

In the project three major components’, construction of new civil structure, Capacity building and minor maintenance will be expected to be undertook at the head of project implementation time.

Construction of new civil structure: treatment tanks, Concrete stands and potable water storage Capacity building: technical training on domestic water scheme management, scheme operation, national guide line adoption and water tariff setting will be major sub activities in capacity building component. Minor maintenance: maintaining water points, Cattle trough, Valve chambers and some electro-mechanical part will be the main activities in the component and expected to be covered by user communities. Adopting new national policies and cascading to the water scheme management structures (WASH-co), Experience sharing, demonstrations at site, different training and follow-up, preparing graduation session and evaluating level of performance will be the main approach for this project.

2. Back ground and Justification

Tuch Denbel is located in Dugda woreda, East Shoa zone of Oromia Regional state. The capital of the districts is Meki. It is located about 130km from the capital of the country, Addis Ababa. The targeted scheme Tuchi Denbel find at the distance 30km south- west to Meki. Ground water is the only source of drinking water in central rift valley. There is no other alternative source to develop domestic water supply scheme. Ground water in rift valley is mainly characterized with high content of fluoride and impermissible temperature due to availability of fluoride parent rocks in the aquifer. The development of domestic water scheme in the rift valley should have treatment plant components to mitigate fluoride to WHO permissible level 1.5g/l.

Tuch Dembel water supply scheme have been developed by “Acqua per la vita” and Ampelos” Italian Charitable Associations, in the aims of improving access to domestic water for Tuch Denbel communities. Even though huge capital investment allocated on it, the scheme do not provide the service that it designed for due to high levels of fluoride in source. At the beginning, Tuch Denbel water supply project had been constructed to scale up domestic water supply coverage of the district and PA to 64% and 96% respectively. But the project is being good for nothing due to high content of fluoride. The domestic water supply coverage of the PA still marked at 0% in the district. The water samples have been taken and tested by different organizations to know the exact levels of fluoride in Tuch Denbel Scheme. According, ECC-SDCBOM and OSHO the fluoride level of the scheme is 12mg/l and 12.4mg/l which approximately the same. So, the water is at impermissible level and needs fluoride treatment plant to be potable. In central rift valley different fluoride mitigation technics have been using at different project sites. Nalgonda, Bronchia and HAP are commonly known the district.

Hydroxyl apatite (HAP) is selected for this project due to high efficiency of fluoride mitigation, easy in operation, low maintenance cost and high availability in market. The filter material (HAP) is being produced by OSHO with a cost of 105birr per kg. The treatment for Tuch Denbel needs about 3300kg to produce 7125L potable water per a day for one year time periods. The regeneration will be continued by communities after a year of scheme operation time. The regeneration cost is fail to 10birr only per a kg which is affordable in community level. The selected technology has a capacity of reducing 14.4 mg F/g which is at least five times higher than the virgin-activated alumina, which has been used extensively for fluoride removal. The saturation points of reagent can about 7 to 8 months.

3. Project GOAL AND objective

3.1 Project Goal

The goal of this project is to improve water quality issue of Tuch Dembel domestic water supply scheme.

3.2 specific objectives

1. To mitigate fluoride to permissible levels in Ethiopia (1.5mg/l to 3mg/l);
2. To refresh the management and operation skill of WASH-co;
3. To enhance service provision continuity of civil structures in the schemes;

1. Expected outcomes

1. Defluoridation plan(HAP) will be constructed with all compartments
2. Refreshment training on domestic water supply scheme management will be provided to WASH-co or 7 individuals which selected from communities by communities ;
3. Scheme operation training will be provided to 4 scheme operators those selected from communities.
4. Reasonable water tariff will be fixed for thet scheme
5. Minor maintenance for vulnerable scheme structures;

2. Major Project Components and Activities

The Construction of new civil structure, Capacity building and minor maintenance will be the major components in this proposed project.

The main activities are summarized as follows.

1. Feasibility study
2. Construction of fluoride treatment plant and system installation
3. Refreshment training on domestic water supply management
4. Skill training on domestic water supply operation
5. Skill training on treatment plant operation
6. Maintenance for selected scheme civil structures
7. Minor service for mechanical parts of the schemes
8. Minor maintenance for valve chambers

1. Construction of new civil structures

Under this component the construction of steel tanker stand foundation or footing concrete tanker stands will be welded and assembled as per design and specification. The sludge tank construction with all required accessory will be undertaken as per removal volume. Design, purchase and assembling of steeliness steel tanks for treatment, and sedimentation purpose will be executed under this project component

In general, constructions of new civil structures have a lion share in the project implementation time and budget allocations.

2. Capacity Building

This component is planned to ensure sustainability in domestic water supply service provision through providing scheme managerial and scheme operational training to WASH-co and operators respectively. Women's participation in all stages of project development will be given due consideration to ensure the sustainability of the scheme service provision

3. Minor maintenance

The component is planned to ensure sustainable service provision continuity of developed water supply scheme through undertaking minor maintenance for selected civil structures in the scheme.

3. Project strategy

This project will be implemented on the foundation of long standing partnership between Acqua per la vita and Ampelos, ECC-SDCBOM, Government stakeholders and user communities. Having good collaboration and technical consultation with Oromo Self Help Organization (OSHO) which has good experience in HAP treatment plant installation could be the main approach that will be used during project implementation. Different scientific empirical formula will be used to clearly set the amounts of residual F^- , volume of sedimentation and treatment tanks at the time design. Different domestic water supply scheme management approach articles and research documents will be revised to set contextual scheme management document for Tuch Denbel scheme. Undertaking consortium discussion at deferent levels of stakeholders will be the main approach used to set management approaches of the scheme and treatment plant.

The targeted community and district level governmental line office expertise have highly participated in project designing and planning. This is main strategy in achieving the targeted objective not only in planning but through participation in project implementation, monitoring and evaluation of the project. This also insures the sustainability of the project.

4. Organization and Management

ECC-SDCCOM has well established management structures and systems in order to achieve the objectives set in the proposal. Accordingly, the specific responsibilities of each stake holders, the relation and authorities are clearly defined.

The main stakeholders are: - Targeted Communities, Donor, ECC-SDCCOM, and Right Government departments

The donor partner will play its stakeholders role through providing appropriate fund for proposed project budget. The organization also will responsible to crosscheck the appropriate allocation of proposed budget as per designed activities. Donors will supports the project through providing regular consultations (Dr Lars Ostewalder -Addis) in planning, monitoring and supervision.

ECC-SDCCOM, will take the role in implementation and monitoring activities of the project. ECC-SDCCOM as the implementing agency will directly lead the technical and administration role of the project, financing the project activities and monitoring the day to day implementation of the project activities at the site level. To undertake these activities, technical staff will be assigned. Other administrative systems such as human resources management systems, monitoring and evaluation guidelines, financial disbursements and reporting procedures, materials procurement procedures are already set and ECC-SDCCOM use this experienced procedures for the implementation of this project.

The local communities have the responsibilities to actively participate in different levels of training, session and decision consulations and readiness for active involvement in project implementation. The government offices at District level will be involved in community mobilization, ensuring the technical standards and quality of the project out puts, supporting and guiding the project implementing agency to plan and implement the project activities according to the undersigned agreement.

CLARIFICATIONS

1. HAP regeneration and Responsible body

HAP regeneration don't have any complicated chemistry, it is so easy. -As it was mentioned on proposal there are three tanks which ordered in tank-1, tank-2 and tank -3, the raw water flow through tank-1, 2 & 3 and then get potable water storage. -The regeneration is simply undertaken by Washing HAP in tank -1 with chemicals and changing the treatment arrangement to tank-3, tank-2 and tank-1. -OSHO is responsible to do the process -User communities are handle the cost because it is so cheap.

2. provision of regeneration material,

There is no provision of additional filters, except wash and replace the existing filter term by term from 1-3 and OSHO is responsible to facilitate the process.

3. Water quality test

Water quality test is regularly conducted at designed HAP saturated period. - it will be undertaken by good collaboration of Water office, MCS and OSHO.

8. Project Monitoring, Evaluation and Reporting

8.1 Monitoring

The purposes of regular monitoring of the project activities could be to check whether the planned project activities carried out as scheduled with the allocated limit budget and based on the set objectives, to check the quality of the construction work as per the required standard, for correction/adjustment and supplementary action of the project implementation.

All stakeholders will conduct monitoring of the project activities. The monitoring and supervision work by each stakeholder is as follows:

1. Ethiopian Catholic Church Social and Development commission Branch office of Meki monitor and supervise the progress of the project implementation conducted regularly base by higher official at every quarter and daily by concerned expert and officer.

2. Other stakeholders and donor agencies monitor and supervise the progress of the project implementation as required.
3. ECC-SDCOM prepares technical and progress report to all stakeholders on a regular basis as per the requirement and standard formats of each organization

8.2 Evaluation

Based on the country NGO operation guidelines, external evaluation by relevant government offices (project Agreement signatories) will also be done and the evaluation report will be submitted to ECC-SDCCOM and stakeholders. The midterm and final evaluation will be conducted to assess the progress made during half of the project period towards achieving the project goal and is conducted in the middle of the project period six month and end of the project period at the end of 12 month.

8.3 Reporting

Quarter and terminal report on the achievements and budget utilization would be complied and reported to respective line department offices at all governmental level and Donor Agency in timely bases.

1. Detail of project activities

S/n	Activities description	Unit	Quantity	Remark
I	Construction of new civil structures			
1	Construction of concrete tanker stand	No	3	At different level
2	Construction of ground pavement	M ²	20	
3	Purchase and install steelness steel thank	No	3	Treatment
4	Pipe works(system inter connection)	Is	1	New & old
5	Water Kiosk (shop of treated water)	No	1	(to sell treated water)
II	Capacity Building			
1	Refreshment training for WASH-co	person	7	
2	Refreshment training for caretaker	Person	2	
3	Treatment operator training	Person	4	Including reserve
4	Tool kit for maintenance	Kit	1	
III	Minor maintenance for civil structure			
1	Water points	No	2	Community contribution
2	Cattle trough	No	1	"
3	Valve chambers	No	2	"
4	Row water tank	No	2	"
VI	Learning, Monitoring and Evaluation			
1	Regular project activities monitoring	quarter	4	
2	Mid-term evaluation	No	1	
3	Experience sharing	Trip	1	
4	Professional hand over	scheme	1	
5	Final evaluation	Scheme	1	
6	Final hand over	Scheme	1	

Figure 1-2 Detail of Activitie

2. Physical and Financial plan

Project Physical and Financial Plan									
S/N	Activities	Unit	Plan			6moths		Expected Source of Finance	
			QTY	Unit cost	Total	Direct Cost	Admin	Italian	User
A	Construction of New Civil Structure								
1	Supply and Install RHS with designed thickness	LS	1	180,000.00	180,000.00	180,000.00		180,000.00	
2	Construction of ground pavement	M²	20	1,000.00	20,000.00	20,000.00		20,000.00	
3	Purchase and install treatment tanks	No	3	60,000.00	180,000.00	180,000.00		180,000.00	
4	Pipe works(system inter connection)	ls	1	40,000.00	40,000.00	40,000.00		40,000.00	
5	Water Kiosk (shop of treated water)	No	1	90,000.00	90,000.00	90,000.00		90,000.00	
6	Supply and Install Hydroxyapatite(HAP)	kg	3,300.00	105.00	346,500.00	346,500.00		346,500.00	
	Subtotal for treatment plant				856,500.00	856,500.00		856,500.00	-
	Capacity Building								
1	Refreshment training for WASH-co	person	7	3,500.00	24,500.00	24,500.00		24,500.00	

2	Refreshment training for caretaker	Person	2	5,000.00	10,000.00	10,000.00		10,000.00	
3	Treatment operator training	Person	2	5,000.00	10,000.00	10,000.00		10,000.00	
4	Tool kit for maintenance	Kit	1	40,000.00	40,000.00	40,000.00		40,000.00	
	Sub Total (Capacity Building)				84,500.00	84,500.00	0.00	84,500.00	-
B	Minor maintenance								
1	Water points	No	2	10,000.00	20,000.00	20,000.00			20,000.00
2	Cattle trough	No	1	15,000.00	15,000.00	15,000.00			15,000.00
3	Valve chambers	No	2	2,000.00	4,000.00	4,000.00			4,000.00
4	Row water tank	No	2	10,000.00	20,000.00	20,000.00			20,000.00
	Subtotal for minor maintenance				59,000.00	59,000.00	0.00		59,000.00
C	Learning, monitoring and evaluation								
1	Regular project activities monitoring	quarter	2	20,000.00	40,000.00		40,000.00	40,000.00	
2	Experience sharing	Trip	1	60,000.00	60,000.00		60,000.00	60,000.00	
3	Final evaluation	Scheme	1	30,000.00	30,000.00		30,000.00	30,000.00	
4	Final hand over	Scheme	1	20,000.00	20,000.00	20,000.00		20,000.00	
5	Audit	No.	1	14,000.00	14,000.00		14,000.00	14,000.00	
	Sub Total (Learning, M&E)				164,000.00	20,000.00	144,000.00	164,000.00	-

D	Project Personal and Fringe 100% for all								
3	Project Water Engineer (100%)	Month	6	20,000.00	120,000.00	120,000.00		120,000.00	
4	Driver	Month	6	8,000.00	48,000.00	48,000.00		48,000.00	
6	Project staff PF	Month	6	7,560.00	45,360.00	45,360.00		45,360.00	
	Sub Total (Personnel cost)				213,360.00	213,360.00	0.00	213,360.00	-
E	Project Support Costs								
1	Fuel and lubricants	Month	6	10,000.00	60,000.00	60,000.00		60,000.00	
2	Stationary and office expense	Month	6	2,000.00	12,000.00		12,000.00	12,000.00	
4	Work Perdieme	Month	6	10,000.00	60,000.00	60,000.00		60,000.00	
	Sub Total (Project Support Cost)				132,000.00	120,000.00	12,000.00	132,000.00	-
	Total				1,509,360.00		156,000.00	1,450,360.00	59,000.00
	Grand Total				1,509,360.00	1,353,360.00	156,000.00	1,509,360.00	
	70/30					90%	10%		

3. Project activities implementation plan in quarter

s/n	Description of activities	Unit	Quant	Quarter plan January (2019 to December 2019)			
				Q-1	Q-2	Q-3	Q-4
	Construction of concrete tanker stand	No	3				
	Construction of ground pavement	M ²	20				
	Purchase and install steeliness steel thank	No	3				
	Pipe works(system inter connection)	ls	1				
	Water Kiosk (shop of treated water)	No	1				
	Refreshment training for WASH-co	person	7				
	Refreshment training for caretaker	Person	2				
	Treatment operator training	Person	4				
	Tool kit for maintenance	Kit	1				
	Water points maintenance	No	2				
	Cattle trough maintenance	No	1				
	Valve chambers maintenance	No	2				
	Row water tank repair	No	2				
	Regular project activities monitoring	quarter	4				
	Mid-term evaluation	No	1				
	Experience sharing	Trip	1				
	Professional hand over	scheme	1				
	Final evaluation	Scheme	1				
	Final hand over	Scheme	1				

Figure 3-3 implementation plan

4. Annex

1. Map of intervention (Country, Region District and Site name)

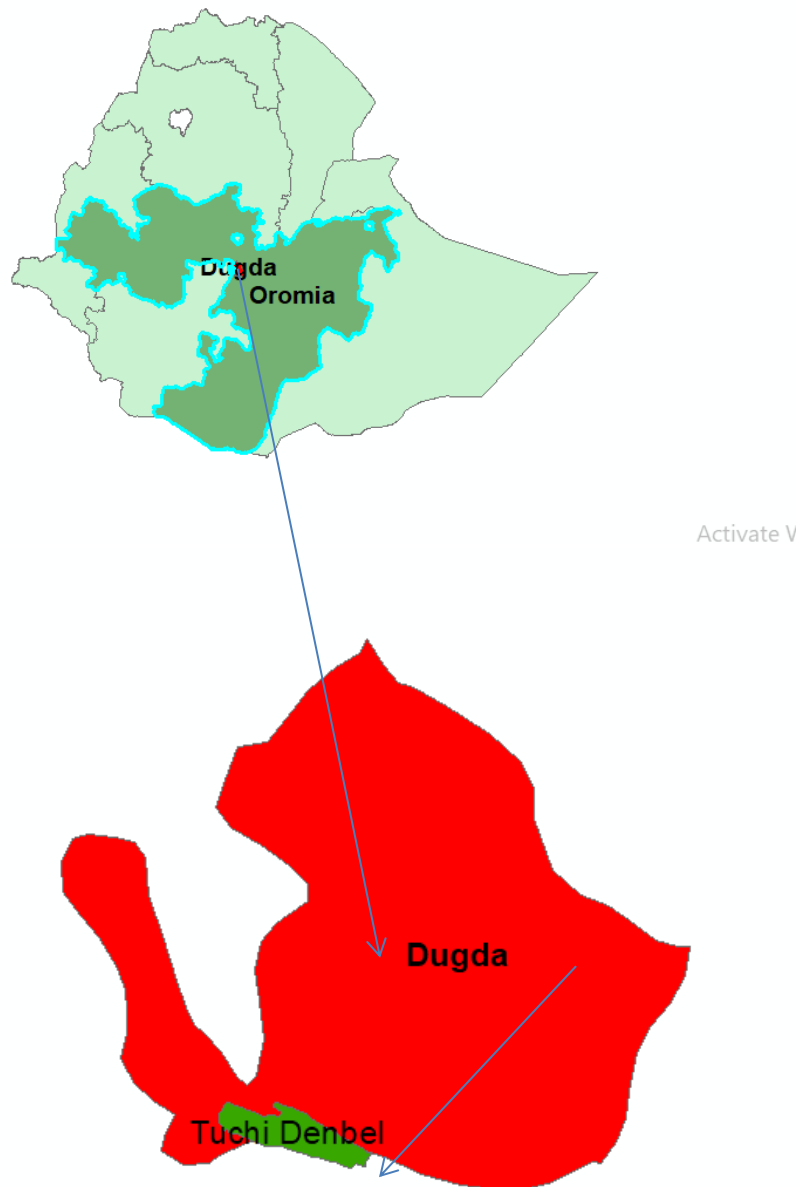


Figure 4-4 Map of site

2. Treatment plant layout

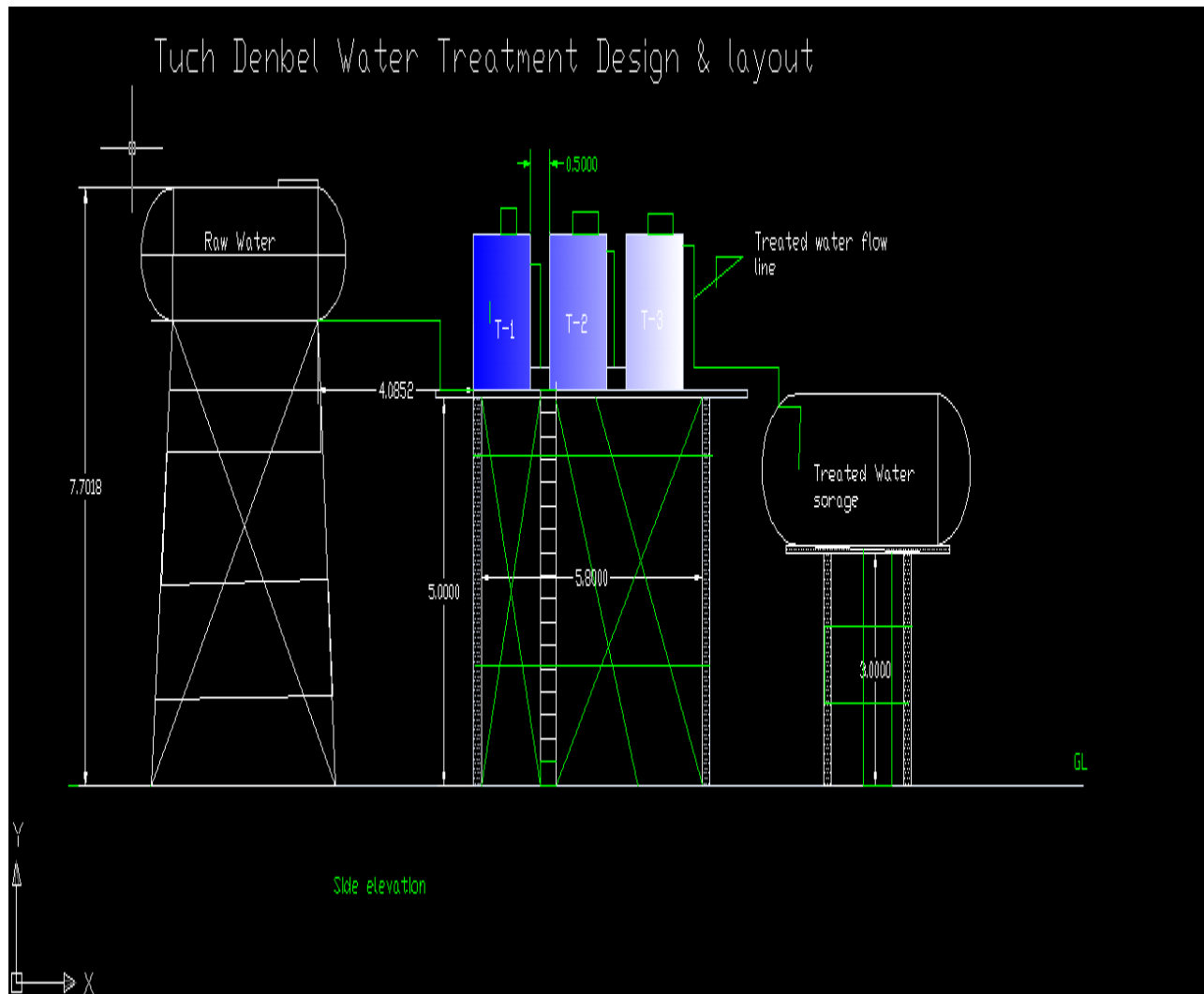


Figure 4-5 treatment plant layout