7(4) 試掘井戸揚水試験結果

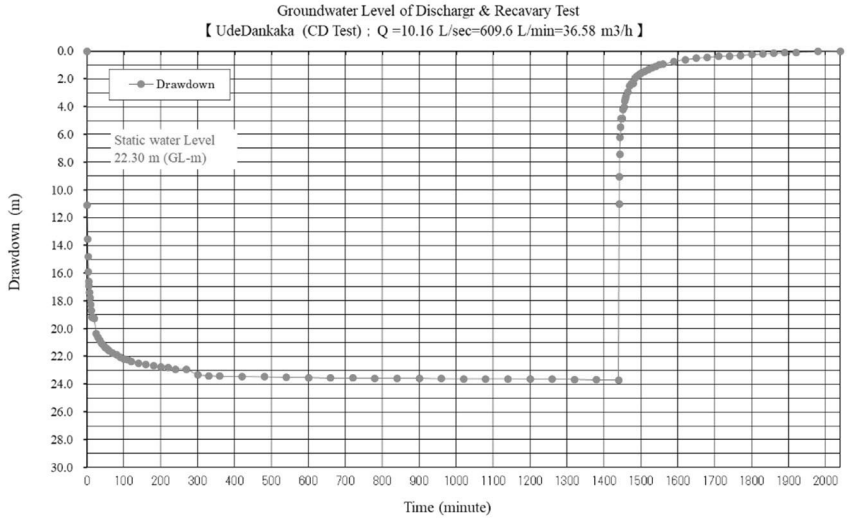
資料 7(4) 試掘井戸揚水試験結果

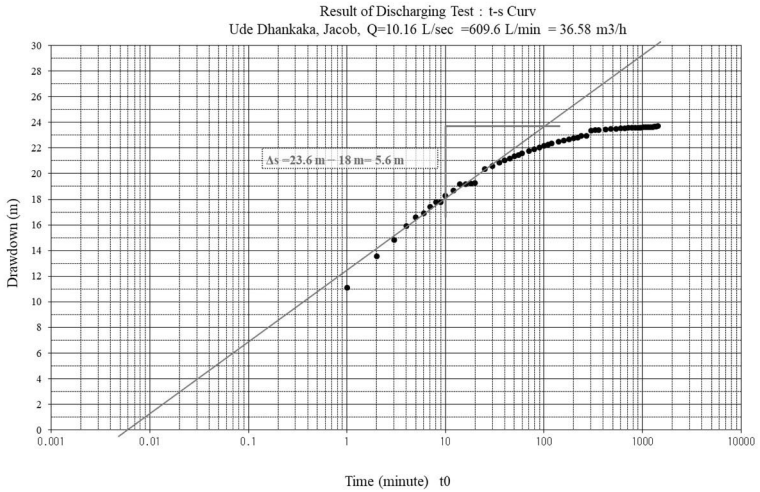
1. Results of Pumping Test

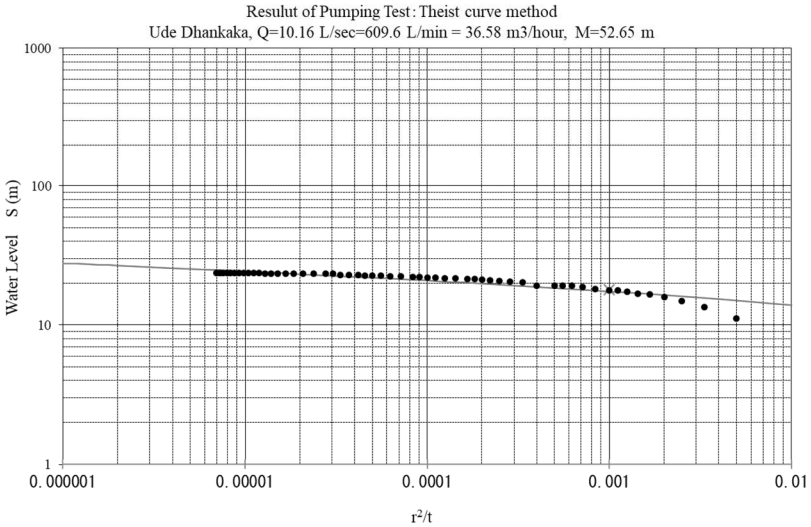
Location			Borehole No.	Yield of Well (L/sec)	Static Water Level (GL - m)	Drawdown (m)	Specific Capacity (m^3/hour/m)	Coefficient of Transmissibility (T) (m^2/min)	Hydraulic Conductivity (K) (cm/sec)	Storage Coefficient (S)
ID	Small Town	Woreda								
ES-6	Ude Dankaka	Adaa	BH-1	10.16	22.30	23.72	1.54	0.022296	7.06E-04	0.07437
ES-8	Kamise	Lome	BH-2	9.09	52.20	3.55	9.22	0.2105	5.32E-03	0.0158
ES-10	Areda	Gimbichu	BH-3	9.07	116.70	5.70	5.73	0.17202	0.005309	0.00875
ES-11	Biyo	Lome	BH-4	10.72	32.65	0.62	62.25	1.35869	0.0486	0.000016
AR-2	Bolo	Jeju	BH-5	4.93	129.33	1.46	12.16	0.277017	1.31E-02	0.00191
AR-6	Gonde	Tiyo	BH-8	3.84	320.80	12.00	1.15	0.032732	6.72E-04	6.11E-10

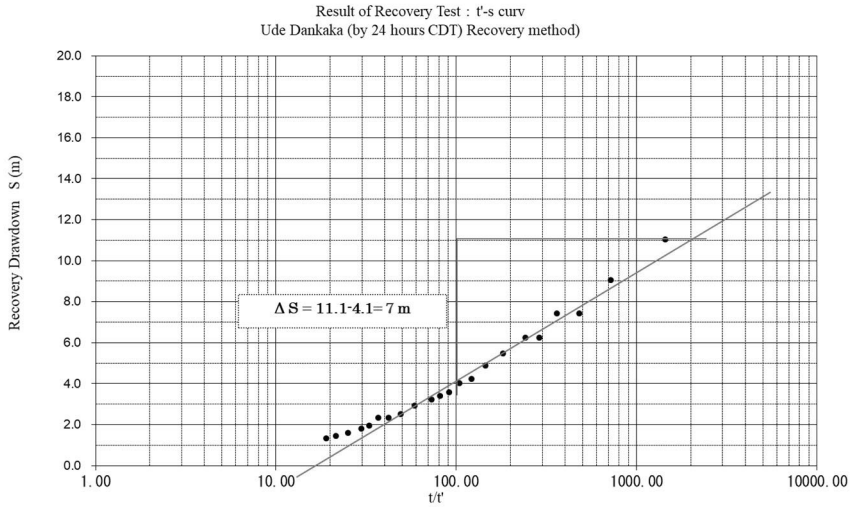
*1: From the results of Continuous Pumping Test

2. Ude Dhankaka (Borehole No.: BH-1)

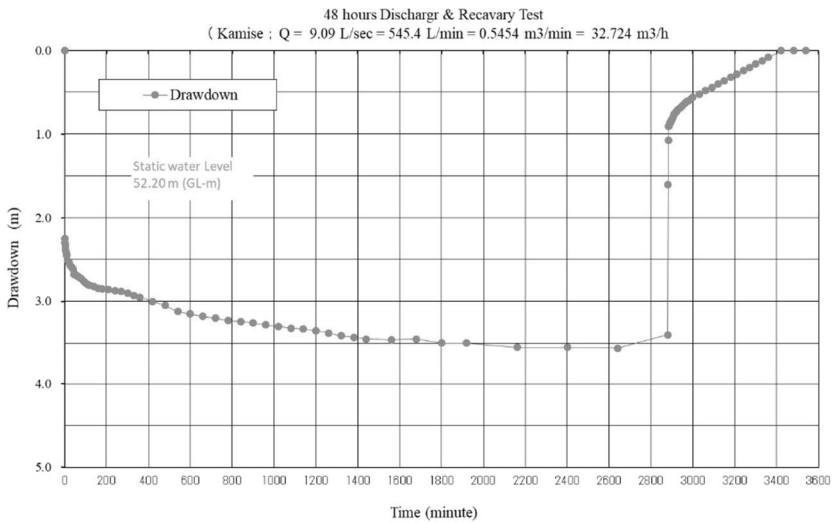


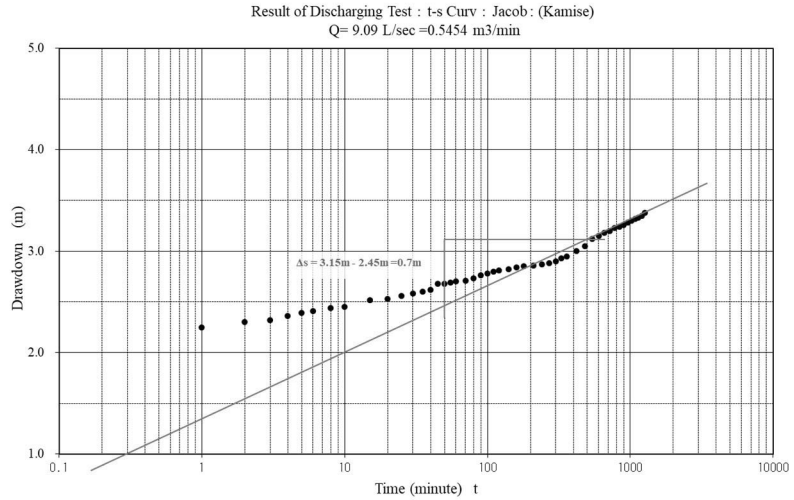


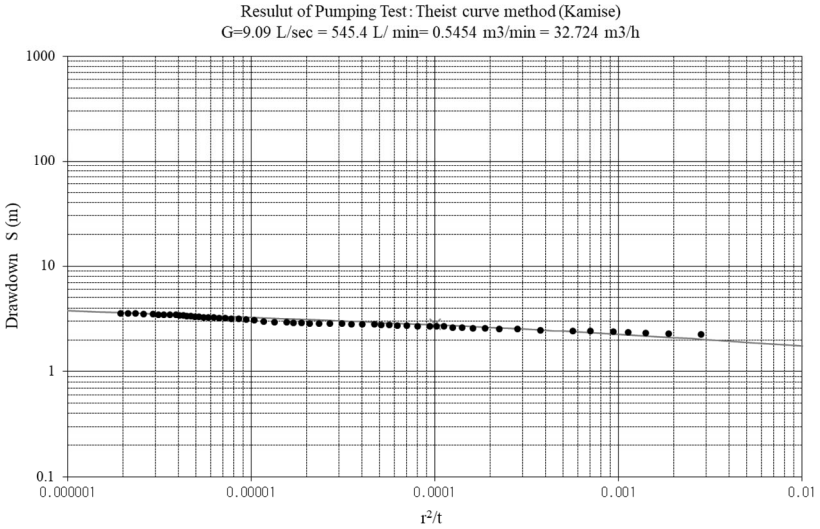


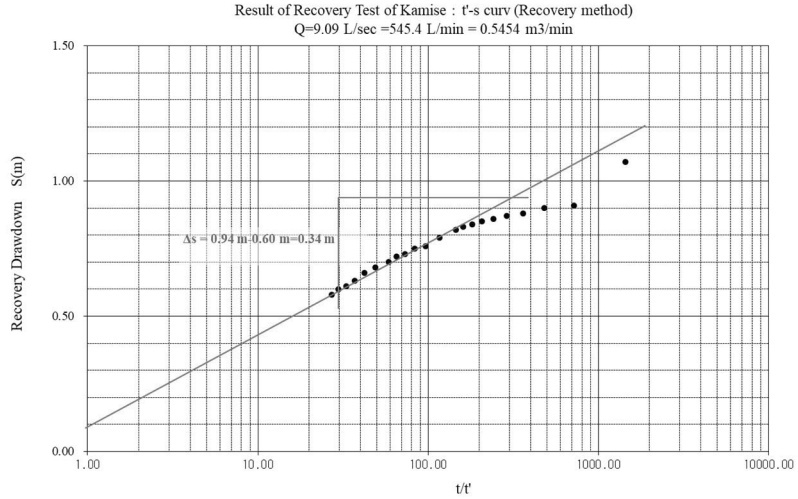


3. Kamise (Borehole No.: BH-2)

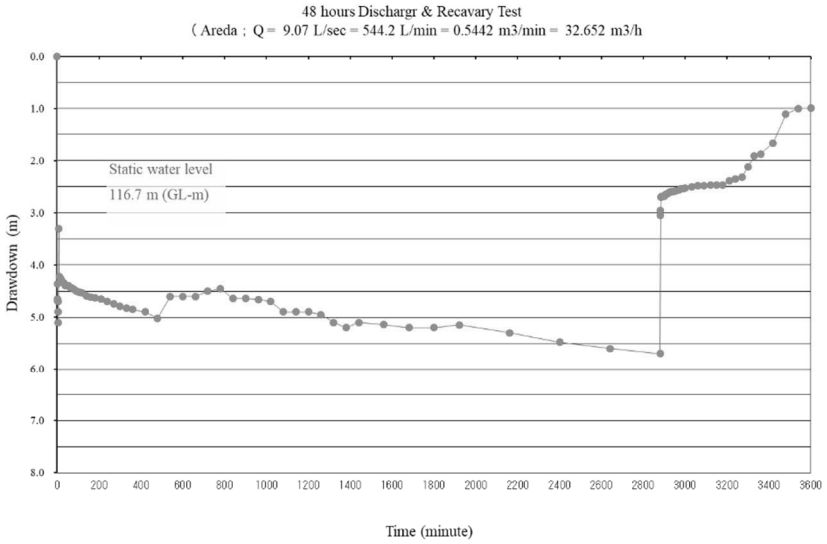


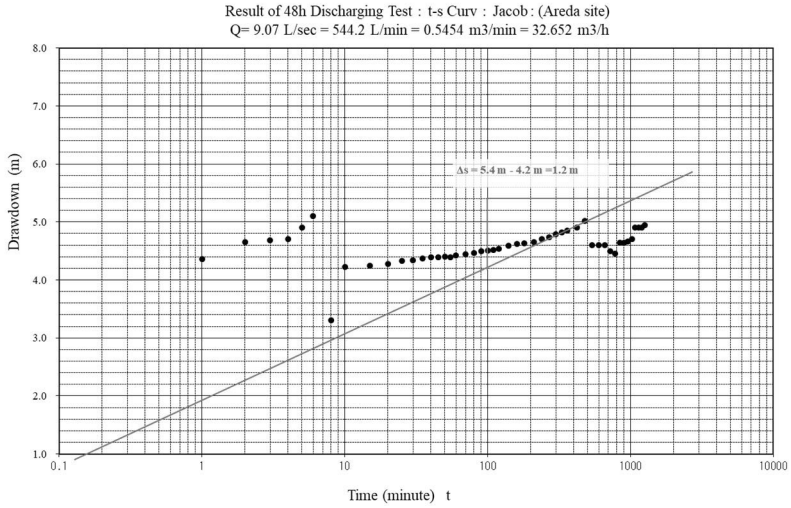


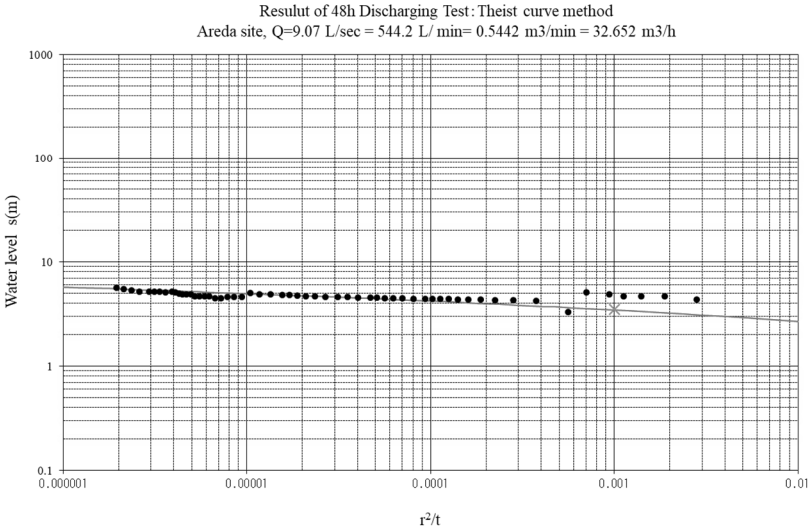


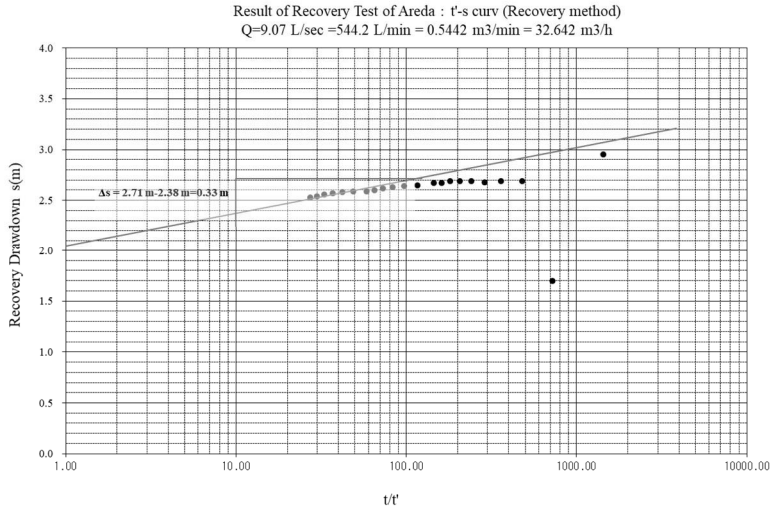


4. Areda (Borehole No.: BH-3)

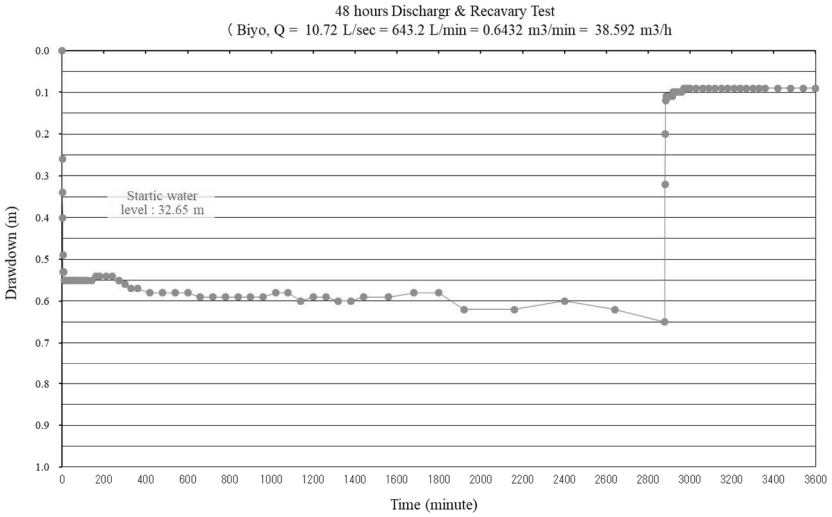


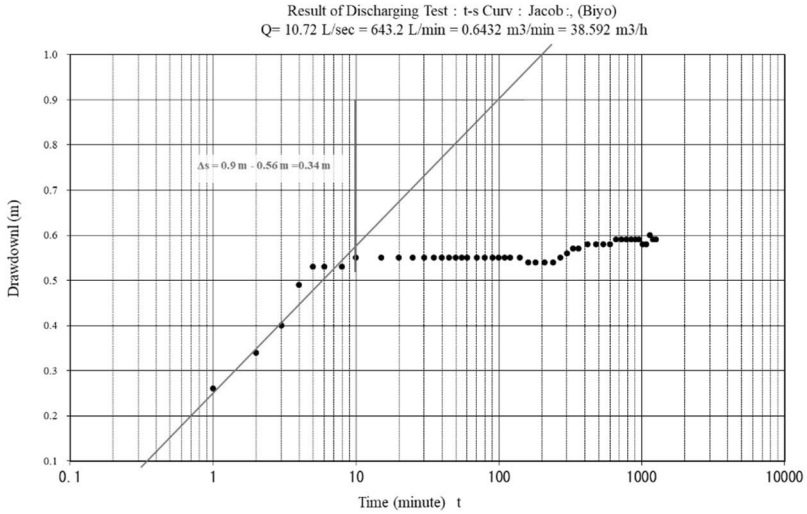


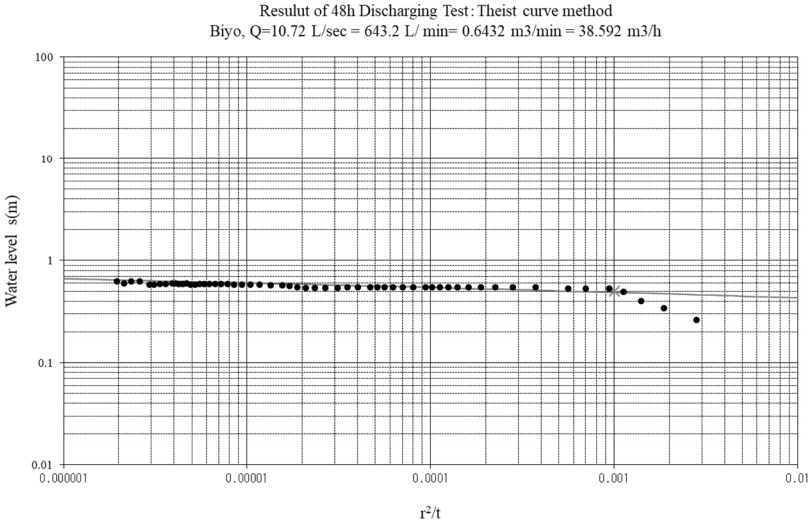


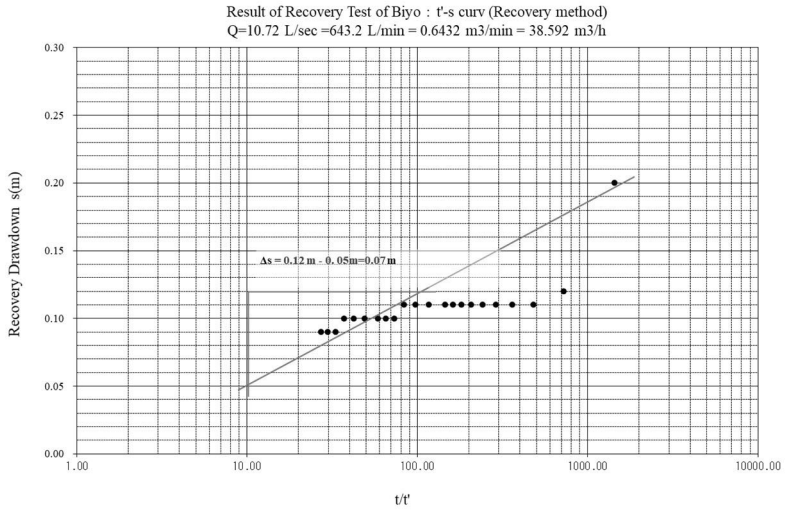


5. Biyo (Borehole No.: BH-4)

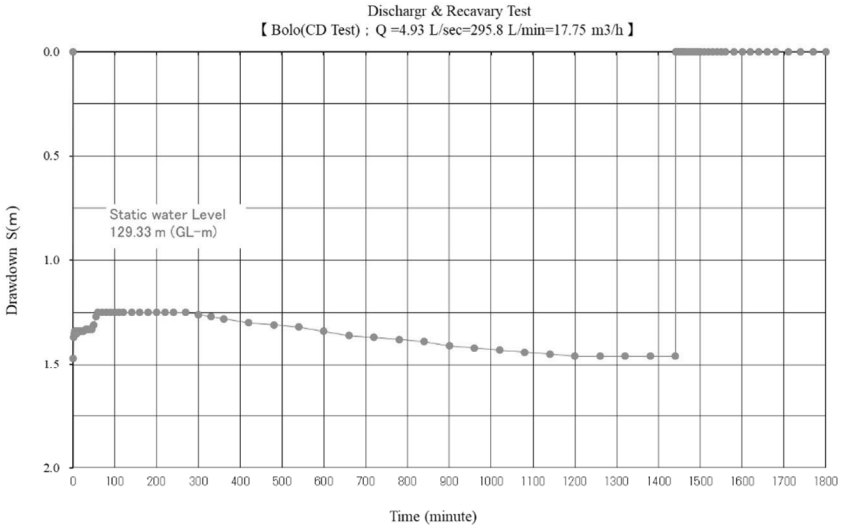


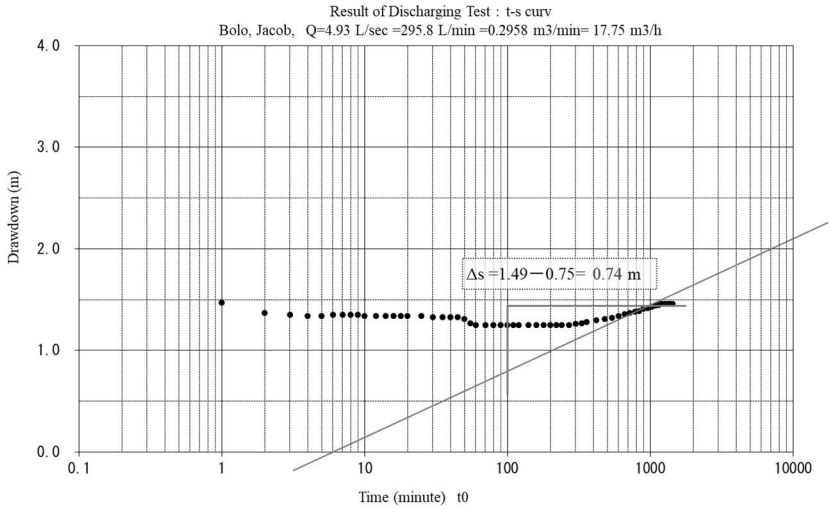


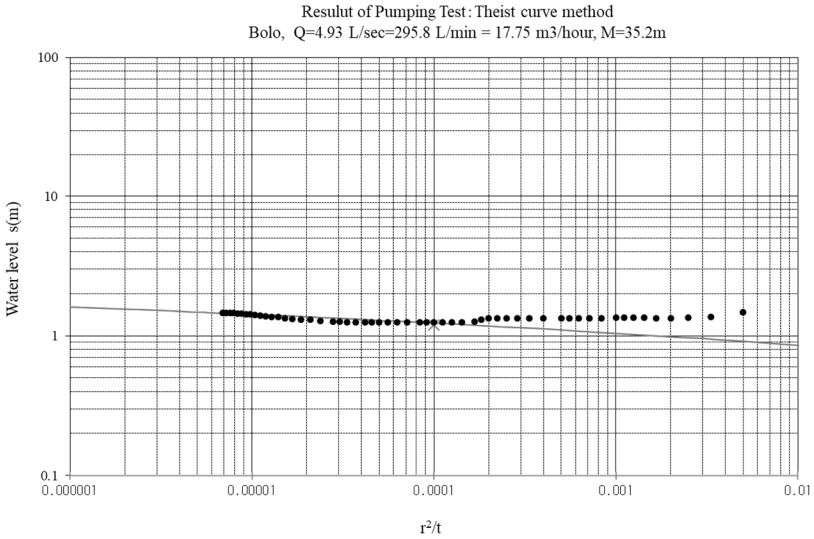


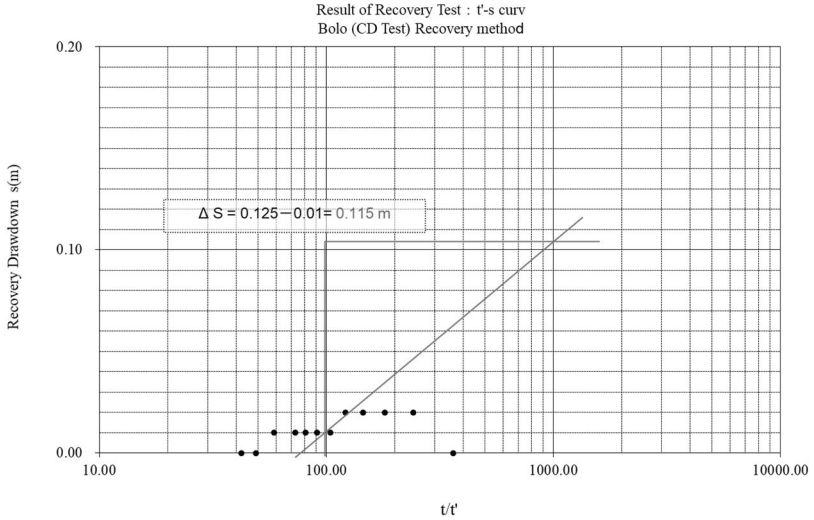


6. Bolo (Borehole No.: BH-5)

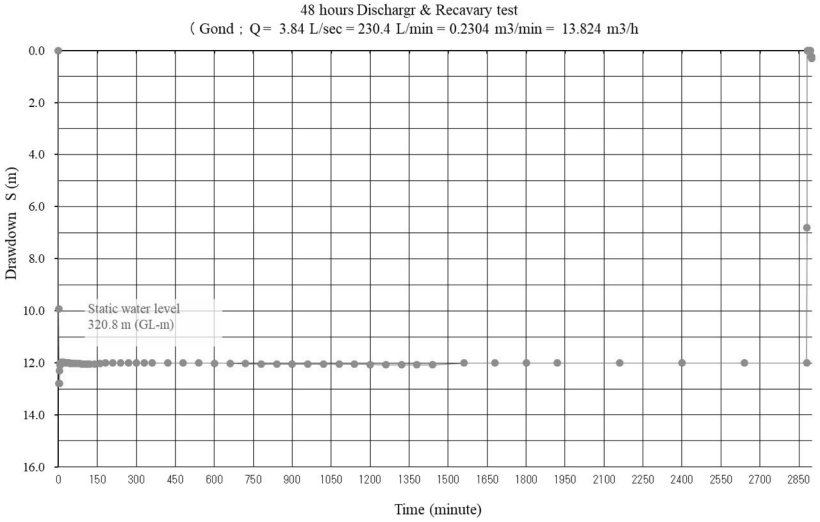


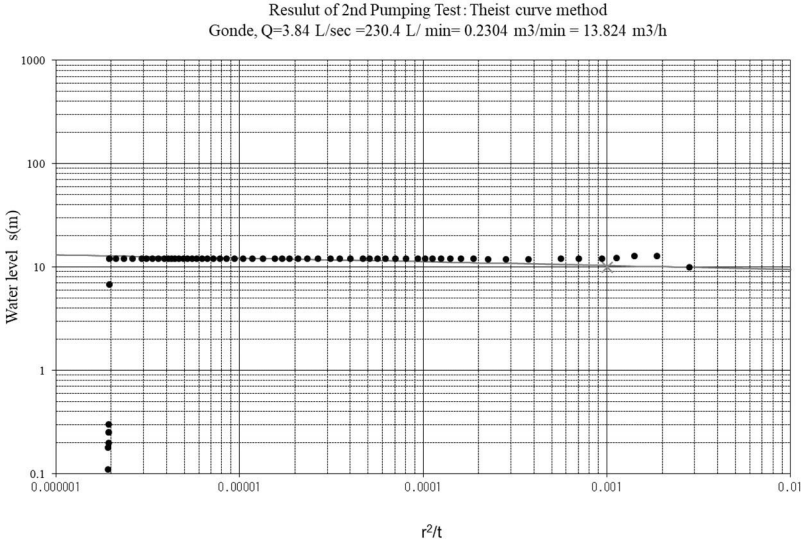


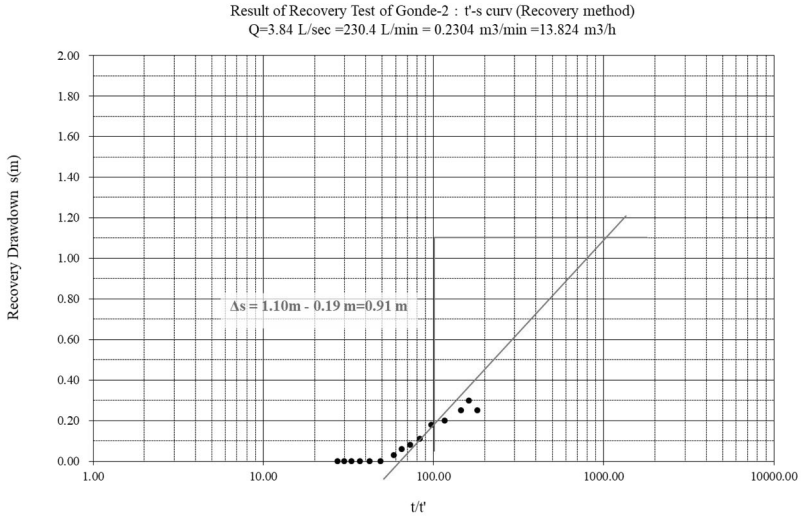




7. Gonde (Borehole No.: BH-8)







7(5) 試掘井戸水質試験結果

資料 7(5) 試掘井戸水質試験結果

1. Ude Dhankaka (Borehole No.: BH-1)

Company Name:
በኢትዮጵያ የኮንስትራክሽን ዲዛይንና ሱፐርቪዥን ሥራዎች ኮርፖሬሽን
Ethiopian Construction Design & Supervision Works Corporation
Tel: + 251-11-872-3643/ + 251-11-872-3478/+ 251-11-869-5125/+ 251-11-872-1236
Fax + 251-11-661-53-71 P.O.Box 2561 E-mail info@ecdswc.com

Title: **Water Quality Testing Report** | Document No: CF/ECDSWC/09/ | Issue No. 1 | Page No. 1 of 1

Lab No.:- 1741/2012
Client/Project: - TAM Geo-Engineering PLC
Client ID:- Ude Denkaka BH 01
Location:- Debrezeit, Ude Denkaka town (ES-06)
Reported Date:- 12/5/2020

Client Ref: - Lab./02/Wq/522/20
Date of Collection: - 15/4/2020
Source of Sample:- BH
Date of Received:- 22/4/2020

No	Tests	Test Results	Test Method	WHO maximum allowable Concentration (mg/L)
1	pH	7.31	Potentiometric	6.5-8.5
2	Electrical Conductivity (µS/cm)	710.00	Potentiometric	–
3	Total Solids 105 ^{0}C (mg/L)	400.00	Total Solids 105 ^{0}C	–
4	T. Dissolved Solid (mg/L)	390.00	Potentiometric	1000.0
5	Turbidity (NTU)	0.56	Turibidimetric	5.0
6	Sodium (mg/L Na^+)	50.00	Flame photometric	200.0
7	Potassium (mg/L K^+)	10.50	Flame photometeric	–
8	Total Iron (mg/L Fe^{2+} & Fe^{3+})	0.28	1,10-Phenothroline	0.3
9	Manganese (mg/L Mn)	Trace	Periodate oxidation	0.1
10	Ammonia (mg/L NH_3-N)	0.19	Nessler	–
11	Total Hardness (mg/L Ca CO_3)	241.30	Titrimetric	500.0
12	Calcium (mg/L Ca^{2+})	61.56	Titrimetric	200.0
13	Magnesium (mg/L Mg^{2+})	20.98	Titrimetric	150.0
14	Alkalinity (mg/L $CaCO_3$)	365.20	Titrimetric	–
15	Carbonate (mg/L CO_3^{2-})	Nil	Titrimetric	–
16	Bicarbonate (mg/L HCO_3^-)	445.54	Titrimetric	–
17	Chloride (mg/L Cl^-)	14.91	Mohr Argentometric	250.0
18	Sulphate (mg/L SO^{2-}_4)	8.12	Turibidimetric	400.0
19	Nitrate (mg/L NO_3-N)	1.19	Cadminium Reduction Method	10.0
20	Nitrite (mg/L NO_2-N)	0.005	Diazotization Method	0.2
19	Fluoride (mg/L F^-)	0.78	Ion-Selective Electrode	1.5
20	Phosphate (mg/L PO_4^{3-}-P)	0.29	Ascorbic acid ,Molybdate blue	–
21	Aluminum(mg/L Al)	Trace	Aluminion	0.2
22	Barium (mg/L)	Trace	Turibidimetric	0.7
23	Copper(mg/L Cu)	Trace	Bicinchoninate	1.5
24	Chromium(mg/L Cr^{+6})	Trace	1,5-Diphenylcarbonohydrazide	0.05
25	Boron(mg/L B)	0.34	Curcumin	0.3
26	Zinc (mg/L)	0.04	Zincon	15

REMARK:- The test result can be compared with the WHO maximum allowable concentration (mg/L) presented on the right column. The water sample is collected and submitted to the laboratory by the client.

Reported by _____ Lab Expert
Checked by _____ Senior Water Quality Expert
Approved by _____ Water Quality S/P Manager

Among the major services rendered by the Water Quality Laboratory Testing S/Process of Ethiopian Construction Design & Supervision Works Corporation are: Testing all the Physico-Chemical and Bacteriological analysis of potable or drinking water/ Bottled drinking water/, waste water, water for construction and irrigation uses and sampling of water and waste water.

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2. Kamise {Borehole No.: BH-2 (1/2)}

Company Name:
በኢትዮጵያ የኮንስትራክሽን ዲዛይንና ሱፐርቪዥን ሥራዎች ኮርፖሬሽን
Ethiopian Construction Design & Supervision Works Corporation
Tel: +251-11-872-3643/+251-11-872-3478/+251-11-869-5125/+251-11-872-1236
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Title:	Document No:	Issue No. 1	Page No.
Water Quality Testing Report	OF/ECDSWC/0941		1 of 1

Lab No.:- 1927/2012
Client/Project: - TAM Geo-Engineering PLC
Client ID:- Kemise BH-01
Location:- Kemis town
Reported Date:- 6/6/2020

Client Ref: - Lab./02/Wq/581/20
Date of Collection: - 21/05/2020
Source of Sample:- BH
Date of Received:- 22/5/2020

No	Tests	Test Results	Test Method	WHO maximum allowable Concentration (mg/L)
1	pH	7.20	Potentiometric	6.5-8.5
2	Electrical Conductivity (µS/cm)	586.00	Potentiometric	–
3	Total Solids 105 ^{0}C (mg/L)	326.00	Total Solids 105 ^{0}C	–
4	T. Dissolved Solid (mg/L)	322.00	Potentiometric	1000.0
5	Turbidity (NTU)	0.75	Turibidimetric	5.0
6	Sodium (mg/L Na^+)	43.00	Flame photometric	200.0
7	Potassium (mg/L K^+)	12.60	Flame photometeric	–
8	Total Iron (mg/L Fe^{2+} & Fe^{3+})	0.15	1,10-Phenothroline	0.3
9	Manganese (mg/L Mn)	Trace	Periodate oxidation	0.1
10	Ammonia (mg/L NH_3-N)	0.28	Nessler	–
11	Total Hardness (mg/L Ca CO_3)	191.90	Titrimetric	500.0
12	Calcium (mg/L Ca^{2+})	56.56	Titrimetric	200.0
13	Magnesium (mg/L Mg^{2+})	12.12	Titrimetric	150.0
14	Alkalinity (mg/L $CaCO_3$)	301.92	Titrimetric	–
15	Carbonate (mg/L CO_3^{2-})	Nil	Titrimetric	–
16	Bicarbonate (mg/L HCO_3^-)	368.34	Titrimetric	–
17	Chloride (mg/L Cl^-)	10.93	Mohr Argentometric	250.0
18	Sulphate (mg/L SO^{2-}_4)	7.37	Turibidimetric	400.0
19	Nitrate (mg/L NO_3-N)	0.88	Cadminium Reduction Method	10.0
20	Nitrite (mg/L NO_2-N)	0.006	Diazotization Method	0.2
19	Fluoride (mg/L F^-)	0.98	Ion-Selective Electrode	1.5
20	Phosphate (mg/L PO_4^{3-}-P)	0.37	Ascorbic acid ,Molybdate blue	
21	Aluminum(mg/L Al)	Trace	Aluminion	0.2
22	Barium (mg/L)	Trace	Turibidimetric	0.7
23	Copper(mg/L Cu)	Trace	Bicinchoninate	1.5
24	Chromium(mg/L Cr^{+6})	Trace	1,5-Diphenylcarbonohydrazide	0.05
25	Boron(mg/L B)	0.10	Curcumin	0.3
26	Zinc (mg/L)	0.01	Zincon	15

REMARK:- The test result can be compared with the WHO maximum allowable concentration (mg/L) presented on the right column. The water sample is collected and submitted to the laboratory by the client.

Reported by _____ Lab Expert
Checked by _____ Senior Water Quality Expert
Approved by _____ Water Quality S/P Manager

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Central Laboratory
E.C.D.S.W.Co
Research Laboratory & Training Center

Kamise {Borehole No.: BH-2 (2/2)}

Company Name:
በኢትዮጵያ የኮንስትራክሽን ዲዛይንና ሱፐርቪዥን ሥራዎች ኮርፖሬሽን
Ethiopian Construction Design & Supervision Works Corporation
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Title:	Document No:	Issue No. 1	Page No.
Water Quality Testing Report	OF/ECDSWC/0941		1 of 1

Lab No.:- 1903/2012
Client/Project: - TAM Geo-Engineering PLC
Client ID:- Kemisse BH-01
Location:- Kemisse Town (ES-06)
Reported Date:- 4/6/2020

Client Ref: - Lab./02/Wq/558/20
Date of Collection: - 21/05/2020
Source of Sample:- BH
Date of Received:- 21/05/2020

No	Tests	Test Results	Test Method	WHO maximum allowable Concentration (mg/L)
1	Total Coliform Per 100 mL	Nil	Membrane Filration	**Undetectable**
2	Fecal Coliform Per 100 mL	Nil	Membrane Filration	**Undetectable**

REMARK:- The test result can be compared with the WHO maximum allowable concentration (mg/L) presented on the right column. The water sample is collected and submitted to the laboratory by the client.

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Checked by _____ Senior Water Quality Expert
Approved by _____ Water Quality S/P Manager

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3. Areda {Borehole No.: BH-3 (1/2)}

Company Name:
በኢትዮጵያ የኮንስትራክሽን ዲዛይንና ሱፐርቪዥን ሥራዎች ኮርፖሬሽን
Ethiopian Construction Design & Supervision Works Corporation
Tel: +251-11-872-3643/+251-11-872-3478/+251-11-869-5125/+251-11-872-1236
Fax +251-11-661-53-71 P.O.Box 2561 E-mail info@ecdswc.com

Title: Water Quality Testing Report	Document No: OF/ECDSWC/0941	Issue No. 1	Page No. 1 of 1

Lab No.:- 754/2013 Client Ref: - Lab./02/Wq/294/21
Client/Project: - TAM Geo-Engineering P.L.C Date of Collection: - –
Client ID:- Areda Town, Gimbichu Woreda ES-10 Source of Sample:- BH
Location:- Oromia Region, East Shewa Zone, Gimbichu woreda Date of Received:- 26/1/2021
Reported Date:- 8/2/2021

No	Tests	Test Results	Test Method	WHO maximum allowable Concentration (mg/L)
1	pH	6.96	Potentiometric	6.5-8.5
2	Electrical Conductivity (µS/cm)	635.00	Potentiometric	–
3	Total Solids 105 ^{0}C (mg/L)	358.00	Total Solids 105 ^{0}C	–
4	T. Dissolved Solid (mg/L)	349.00	Potentiometric	1000.0
5	Turbidity (NTU)	0.70	Turibidimetric	5.0
6	Sodium (mg/L Na^+)	27.00	Flame photometric	200.0
7	Potassium (mg/L K^+)	6.60	Flame photometeric	–
8	Total Iron (mg/L Fe^{2+} & Fe^{3+})	0.35	1,10-Phenothroline	0.3
9	Manganese (mg/L Mn)	Trace	Periodate oxidation	0.4
10	Ammonia (mg/L NH_3-N)	0.23	Nessler	–
11	Total Hardness (mg/L Ca CO_3)	225.75	Titrimetric	500.0
12	Calcium (mg/L Ca^{2+})	63.64	Titrimetric	200.0
13	Magnesium (mg/L Mg^{2+})	16.00	Titrimetric	150.0
14	Alkalinity (mg/L $CaCO_3$)	275.00	Titrimetric	–
15	Carbonate (mg/LCO_3^{2-})	Nil	Titrimetric	–
16	Bicarbonate (mg/L HCO_3^-)	335.50	Titrimetric	–
17	Chloride (mg/L Cl^-)	3.98	Mohr Argentometric	250.0
18	Sulphate (mg/L SO^{2-}_4)	1.19	Turibidimetric	400.0
19	Nitrate (mg/L NO_3-N)	0.21	Cadminium Reduction Method	10.0
20	Nitrite (mg/L NO_2-N)	0.01	Diazotization Method	3.0
21	Fluoride (mg/L F^-)	1.10	Ion-Selective Electrode	1.5
22	Phosphate (mg/L PO_4^{3-}-P)	0.08	Ascorbic acid ,Molybdate blue	–
23	Aluminum(mg/L Al)	Trace	Aluminion	0.2
24	Barium (mg/L)	Trace	Turibidimetric	0.7
25	Chromium(mg/L Cr^{+6})	Trace	1,5-Diphenylcarbonohydrazide	0.05
26	Boron(mg/L B)	0.03	Curcumin	0.5
27	Zinc (mg/L)	0.03	Zincon	15
28	Total Coliform Per 100 mL	Nil	Membrane Filration	Undetectable
29	Fecal Coliform Per 100 mL	Nil	Membrane Filration	Undetectable

REMARK:- The test result can be compared with the WHO maximum allowable concentration (mg/L) presented on the right column. The water sample is collected and submitted to the laboratory by the client.

Reported by_____ Checked by_____ Approved by_____
Lab Expert Senior Water Quality Expert Water Quality S/P Manager

Among the major services rendered by the Water Quality Laboratory Testing S/Process of Ethiopian Construction Design & Supervision Works Corporation are: Testing all the Physico-Chemical and Bacteriological analysis of potable or drinking water/ Bottled drinking water/, waste water, water for construction and irrigation uses and sampling of water and waste water.

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Areda {Borehole No.: BH-3 (2/2)}

CDSWC	Company Name: በኢትዮጵያ የኮንስትራክሽን ዲዛይንና ሱፐርቪዥን ሥራዎች ኮርፖሬሽን **Ethiopian Construction Design & Supervision Works Corporation** Tel: +251-11-872-3643/+251-11-872-3478/+251-11-869-5125/+251-11-872-1236 Fax +251-11-661-53-71 P.O.Box 2561 E-mail info@ecdswc.com

Title:	Document No:	Issue No. 1	Page No.
Water Quality Testing Report	OF/ECDSWC/0941		2 of 2

Lab No.:-	754/2013	Client Ref: -	Lab./02/Wq/322/21
Client/Project: -	TAM Geo-Engineering P.L.C	Date of Collection: -	_
Client ID:-	Areda Town, Gimbichu Woreda ES-10	Source of Sample:-	BH
Location:-	Oromia Region, East Shewa Zone, Gimbichu woreda	Date of Received:-	26/1/2021
Reported Date:-	26/2/2021		

No	Tests	Test Results	Test Method	WHO maximum allowable Concentration (mg/L)
1	Copper(mg/L Cu)	Trace	Bicinchoninate	2

REMARK:- The test result can be compared with the WHO maximum allowable concentration (mg/L) presented on the right column. The water sample is collected and submitted to the laboratory by the client.

Reported by_____ Checked by_____ Approved by_____

Lab Expert Senior Water Quality Expert Water Quality S/P Manager

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4. Biyo (Borehole No.: BH-4)

Company Name: በኢትዮጵያ የኮንስትራክሽን ዲዛይንና ሱፐርቪዥን ሥራዎች ኮርፖሬሽን
Ethiopian Construction Design & Supervision Works Corporation
Tel. - 251-11-872-3643/ - 251-11-872-3478/ - 251-11-869-5125/ - 251-11-872-1236
Fax - 251-11-661-53-71 P.O.Box 2561 E-mail info@ecdswc.com

Title	Document No.	Issue No. 1	Page No.
Water Quality Testing Report	pr.ecdswc/09-1		1 of 1

Lab No.:- 933/2013
Client/Project:- TAM Geo-Engineering PLC
Client ID:- Biyo-BH-ES-11
Location:- Biyo Town in Lume Woreda
Reported Date:- 17/03/2021

Client Ref: - Lab./02/Wq/355/21
Date of Collection: - 1/2/2021
Source of Sample:- Bore Hole
Date of Received:- 2/3/2021

No.	Tests	Test Results	Test Method	WHO maximum allowable Concentration (mg/L)
1	pH	6.81	Potentiometric	6.5-8.5
2	Electrical Conductivity (µS/cm)	663.00	Potentiometric	–
3	Total Solids 105 ^{0}C (mg/L)	366.00	Total Solids 105 ^{0}C	–
4	T. Dissolved Solid (mg/L)	362.00	Potentiometric	1000.0
5	Turbidity (NTU)	0.80	Turibidimetric	5.0
6	Sodium (mg/L Na^+)	48.00	Flame photometric	200.0
7	Potassium (mg/L K^+)	12.30	Flame photometeric	–
8	Total Iron (mg/L Fe^{2+} & Fe^{3+})	0.06	1,10-Phenothroline	0.3
9	Manganese (mg/L Mn)	Trace	Periodate oxidation	0.4
10	Ammonia (mg/L NH_3-N)	0.26	Nessler	–
11	Total Hardness (mg/L $CaCO_3$)	247.52	Titrimetric	500.0
12	Calcium (mg/L Ca^{2+})	57.41	Titrimetric	200.0
13	Magnesium (mg/L Mg^{2+})	24.96	Titrimetric	150.0
14	Alkalinity (mg/L $CaCO_3$)	337.84	Titrimetric	–
15	Carbonate (mg/L CO_3^{2-})	Nil	Titrimetric	–
16	Bicarbonate (mg/L HCO_3^-)	412.16	Titrimetric	–
17	Chloride (mg/L Cl^-)	17.89	Mohr Argentometric	250.0
18	Sulphate (mg/L SO^{2-}_4)	12.60	Turibidimetric	400.0
19	Nitrate (mg/L NO_3-N)	1.61	Cadminium Reduction Method	10.0
20	Nitrite (mg/L NO_2-N)	0.007	Diazotization Method	3.0
19	Fluoride (mg/L F^-)	1.10	Ion-Selective Electrode	1.5
20	Phosphate (mg/L PO_4^{3-}-P)	0.10	Ascorbic acid ,Molybdate blue	–
21	Aluminum(mg/L Al)	Trace	Aluminion	0.2
22	Barium (mg/L)	Trace	Turibidimetric	0.7
23	Copper(mg/L Cu)	Trace	Bicinchoninate	2
24	Chromium(mg/L Cr^{+6})	Trace	1,5-Diphenylcarbonohydrazide	0.05
25	Boron(mg/L B)	0.11	Curcumin	0.5
26	Zinc (mg/L)	0.04	Zincon	15
27	Molybedum (mg/L Mo)	Trace	Mercaptoacetic Acid	0.07
28	Nickel (mg/L)	Trace	Heptoxime	0.07
29	Silica (mg/L SiO_2)	75.52	Molybdosilicate	–
30	Total Coliform Per 100 mL	4.00	Membrane Filration	Undetectable
31	Fecal Coliform Per 100 mL	Nil	Membrane Filration	Undetectable

REMARK:- The test result can be compared with the WHO maximum allowable concentration (mg/L) presented on the right column. The water sample is collected and submitted to the laboratory by the client.

Reported by _____ Lab Expert
Checked by _____ Senior Water Quality Expert
Approved by _____ Water Quality S/P Manager

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5. Bolo (Borehole No.: BH-5)

Company Name:
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Ethiopian Construction Design & Supervision Works Corporation
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Title:	Document No:	Issue No. 1	Page No.
Water Quality Testing Report	OF/ECDSWC/0941		1 of 1

Lab No.:- 1645/2012
Client/Project: - TAM Geo-Engineering PLC
Client ID:- Bolo Town (AR-02)
Location:- Bolo Town
Reported Date:- 13/4/2020

Client Ref: - Lab./02/Wq/502/20
Date of Collection: - 21/03/2020
Source of Sample:- BH
Date of Received:- 7/4/2020

No	Tests	Test Results	Test Method	WHO maximum allowable Concentration (mg/L)
1	pH	7.54	Potentiometric	6.5-8.5
2	Electrical Conductivity (µS/cm)	472.00	Potentiometric	–
3	Total Solids 105 ^{0}C (mg/L)	262.00	Total Solids 105 ^{0}C	–
4	T. Dissolved Solid (mg/L)	253.00	Potentiometric	1000.0
5	Turbidity (NTU)	1.25	Turibidimetric	5.0
6	Sodium (mg/L Na^+)	29.50	Flame photometric	200.0
7	Potassium (mg/L K^+)	8.00	Flame photometeric	–
8	Total Iron (mg/L Fe^{2+} & Fe^{3+})	0.15	1,10-Phenothroline	0.3
9	Manganese (mg/L Mn)	Trace	Periodate oxidation	0.1
10	Ammonia (mg/L NH_3-N)	0.09	Nessler	–
11	Total Hardness (mg/L Ca CO_3)	193.44	Titrimetric	500.0
12	Calcium (mg/L Ca^{2+})	52.42	Titrimetric	200.0
13	Magnesium (mg/L Mg^{2+})	14.98	Titrimetric	150.0
14	Alkalinity (mg/L $CaCO_3$)	268.38	Titrimetric	–
15	Carbonate (mg/L CO_3^{2-})	Nil	Titrimetric	–
16	Bicarbonate (mg/L HCO_3^-)	327.42	Titrimetric	–
17	Chloride (mg/L Cl^-)	9.94	Mohr Argentometric	250.0
18	Sulphate (mg/L SO^{2-}_4)	Trace	Turibidimetric	400.0
19	Nitrate (mg/L NO_3-N)	0.68	Cadminium Reduction Method	10.0
20	Nitrite (mg/L NO_2-N)	0.003	Diazotization Method	0.2
21	Fluoride (mg/L F^-)	0.71	Ion-Selective Electrode	1.5
22	Phosphate (mg/L PO_4^{3-}-P)	0.21	Ascorbic acid ,Molybdate blue	
23	Aluminum(mg/L Al)	Trace	Aluminion	0.2
24	Barium (mg/L)	Trace	Turibidimetric	0.7
25	Copper(mg/L Cu)	Trace	Bicinchoninate	1.5
26	Chromium(mg/L Cr^{+6})	Trace	1,5-Diphenylcarbonohydrazide	0.05
27	Boron(mg/L B)	Trace	Curcumin	0.3
28	Zinc (mg/L)	0.004	Zincon	15

REMARK:- The test result can be compared with the WHO maximum allowable concentration (mg/L) presented on the right column. The water sample is collected and submitted to the laboratory by the client.

Reported by ____ Lab Expert
Checked by ____ Senior Water Quality Expert
Approved by ____ Water Quality S/P Manager

Among the major services rendered by the Water Quality Laboratory Testing S/Process of Ethiopian Construction Design & Supervision Works Corporation are: Testing all the Physico-Chemical and Bacteriological analysis of potable or drinking water/ Bottled drinking water/, waste water, water for construction and irrigation uses and sampling of water and waste water.

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E.C.D.S.W.Co Central Laboratory Research, Laboratory & Training Center

6. Gonde {Borehole No.: BH-8 (1/2)}

Company Name:
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Ethiopian Construction Design & Supervision Works Corporation
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Title: Water Quality Testing Report	Document OF/ECDSWC/0	Issue No. 1	Page No. 1 of 1

Lab No.:- 1031/2013
Client/Project: - Hydro Construction & Engineering Ethiopia PLC
Client ID:- Gonde Kokusi Koyyo Co.LTD
Location:- Aris Zone
Reported Date:- 9/4/2021

Client Ref: - Lab./02/Wq/1031/21
Date of Collection: - 25/3/2021
Source of Sample:- Bore Hole
Date of Received:- 25/3/2021

No	Tests	Test Results	Test Method	WHO maximum allowable Concentration (mg/L)
1	pH	7.93	Potentiometric	6.5-8.5
2	Electrical Conductivity (µS/cm)	242.00	Potentiometric	_
3	Total Solids 105 ^{0}C (mg/L)	138.00	Total Solids 105 ^{0}C	_
4	T. Dissolved Solid(mg/L)	133.10	Potentiometric	1000.0
5	Turbidity (NTU)	0.75	Turibidimetric	5.0
6	Sodium (mg/L Na^+)	11.3	Flame photometric	200.0
7	Potassium (mg/L K^+)	4.6	Flame photometeric	_
8	Total Iron (mg/L Fe^{2+} & Fe^{3+})	Trace	Flame AAS	0.3
9	Manganese (mg/L Mn)	Trace	Flame AAS	0.4
10	Ammonia (mg/L NH_3-N)	0.3	Nessler	_
11	Total Hardness (mg/L Ca CO_3)	41.88	Titrimetric	500.0
12	Calcium (mg/L Ca^{2+})	15.81	Flame AAS	200.0
13	Magnesium (mg/L Mg^{2+})	10.05	Flame AAS	150.0
14	Alkalinity (mg/L $CaCO_3$)	107.12	Titrimetric	_
15	Carbonate (mg/LCO_3^{2-})	Nil	Titrimetric	_
16	Bicarbonate (mg/L HCO_3^-)	130.69	Titrimetric	_
17	Chloride (mg/L Cl^-)	4.97	Mohr Argentometric	250.0
18	Sulphate (mg/L SO^{2-}_4)	2.99	Turibidimetric	400.0
19	Nitrate (mg/L NO_3-N)	0.62	Cadminium Reduction Method	10.0
20	Nitrite (mg/L NO_2-N)	0.037	Diazotization Method	3.0
21	Fluoride (mg/L F^-)	0.92	Ion-Selective Electrode	1.5
22	Phosphate (mg/L PO_4^{3-}-P)	0.36	Ascorbic acid ,Molybdate blue	_
23	Boron(mg/L B)	0.30	Curcumin	0.5
24	Copper (Cd)	Trace	Flame AAS	_
25	Zinc (zn)	Trace	Flame AAS	_
26	Chromium(µg/L Cr)	0.02	Graphite Furnace AAS	_
27	Aluminum(Al)	Trace	Flame AAS	_
28	Barium (mg/L)	Trace	Turibidimetric	0.7
29	Total Coliform Per 100 mL	150.00	Membrane Filration	Undetectable
30	Fecal Coliform Per 100 mL	Nil	Membrane Filration	Undetectable

REMARK:- The test result can be compared with the WHO maximum allowable concentration (mg/L) presented on the right column. The water sample is collected and submitted to the laboratory by the client.

Reported by _____ Lab Expert
Checked by _____ Senior Water Quality Expert
Approved by _____ Water Quality S/P Manager

Among the major services rendered by the Water Quality Laboratory Testing S/Process of Ethiopian Construction Design & Supervision Works Corporation are: Testing all the Physico-Chemical and Bacteriological analysis of potable or drinking water/ Bottled drinking water/, waste water, water for construction and irrigation uses and sampling of water and waste water.

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Gonde {Borehole No.: BH-8 (2/2)}

CDSWC	Company Name: በኢትዮጵያ የኮንስትራክሽን ዲዛይንና ሱፐርቪዥን ሥራዎች ኮርፖሬሽን **Ethiopian Construction Design & Supervision Works Corporation**
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Title:	Document No:	Issue No. 1	Page No.
Water Quality Testing Report	OF/ECDSWC/0941		1 of 1

Lab No.:-	1152/2013	Client Ref: -	Lab./02/Wq/455/21
Client/Project: -	Hydro Construction & Engineering Ethiopia PLC	Date of Collection: -	–
Client ID:-	Gonde site	Source of Sample:-	BH
Location:-	Arsi Zone	Date of Received:-	21/4/2021
Reported Date:-	23/4/2021		

No	Tests	Test Results	Test Method	WHO maximum allowable Concentration (mg/L)
1	Total Coliform Per 100 mL	Excess	Membrane Filration	**Undetectable**
2	Fecal Coliform Per 100 mL	Nil	Membrane Filration	**Undetectable**

REMARK:- The test result can be compared with the WHO maximum allowable concentration (mg/L) presented on the right column. The water sample is collected and submitted to the laboratory by the client.

Reported by ____ Lab Expert Checked by ____ Senior Water Quality Expert Approved by ____ Water Quality S/P Manager

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7(6) 地盤調査結果

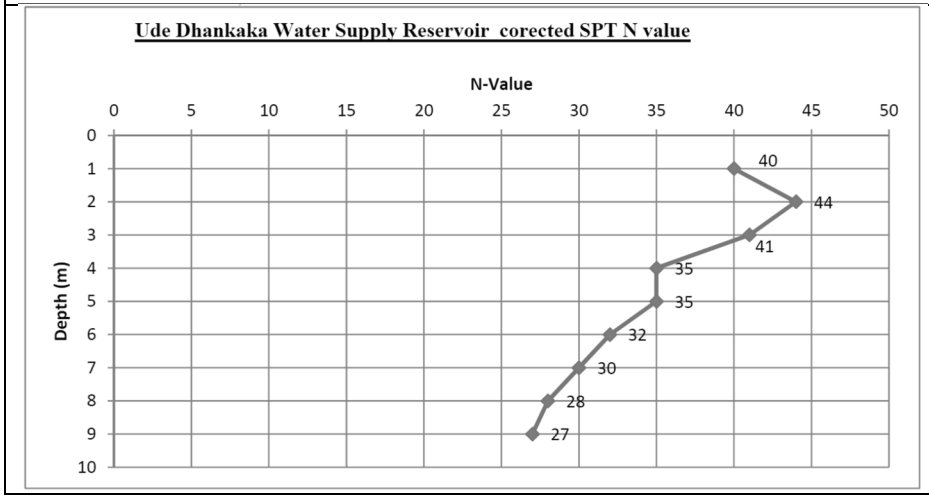
資料 7(6) 地盤調査結果

1. Ude Dhankaka

Water Supply Reservoir Site

S. No	BH-ID	Easting	Northing	Altitude (m)	Depth(m)
1	BH-1	503797	958315	1915	10.0

No	BH ID	Depth	UCS (KN/m²)	absorption	Specific gravity	Sieve analysis			Atterberg Limits			Unit weight(Kg/m³)	Cohesion (kN/m²)	Angle of internal friction (indegree)
						Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	BH-1	3.40-3.70	-	-	2.62	0	23	39&38	42.5	13.81	MH	1836	26	21
2	BH-1	5.40-5.70	28630	2.03	-	-	-	-	-	-	rock	2350	-	-
3	BH-1	9.25-9.50	25630	-	-	-	-	-	-	-	rock	2240	-	-



Town Water Supply Office Building Site

S. No	TP-ID	Easting	Northing	Altitude (m)	Depth(m)
1	DWOTP-1	504062	959741		1.60
2	DWOTP-1	504058	959742		1.50

No	TP ID	Depth	Chemical test of soil (BS 1377)			Sieve analysis			Atterberg Limits			Unit weight(kg/m³)	Cohesion (kN/m²)	Angle of internal friction (in degree)
			PH	Chloride (mg/lit)	Sulphate(mg/lit)	Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	DWSO TP1	1.50	6.7	3.70	4.10	0	27	73	67.8	23.40	MH	-	-	-
	DWSO TP2	0.50 - 1.00	6.9	3.66	2.77	-	-	-	63.5	22.65	MH	1841	18	19

s.no	Test pit ID	Depth DCP conducted (m)	DCP (mm/below)	Converted SPT N Value	Average N value b/n .5B and 2B
1	DWSO TP1	surface	24	11	1st layer N value =11
2	DWSO TP1	1.60	29	9	
3	DWSO TP2	surface	26	11	2nd layer N value= 9
4	DWSO TP2	1.50	29	9	

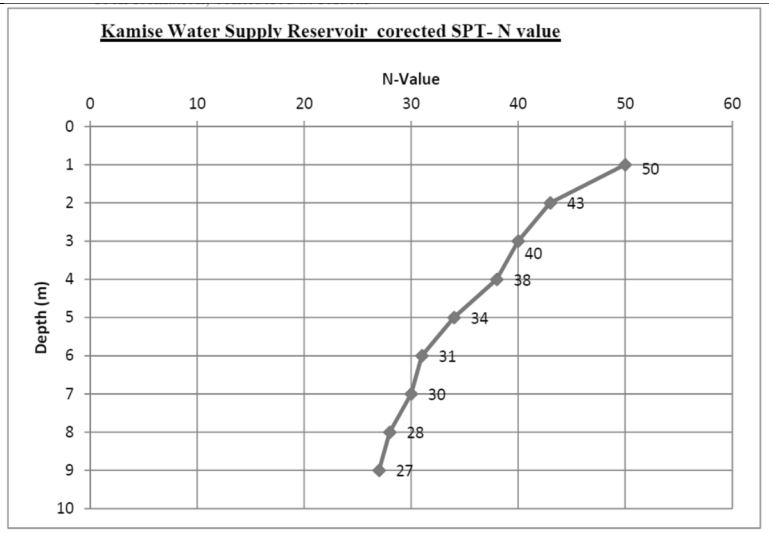
DLWSO TP1= Dhenkeka water supply office test pit 1

2. Kamise

Water Supply Reservoir Site

S. No	BH-ID	Easting	Northing	Altitude (m)	Depth(m)
1	BH-1	512268	962738	1996	10.0

No	BH ID	Depth	UCS (KN/m^2)	absorption	Specific gravity	Sieve analysis			Atterberg Limits			Unit weight(Kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (indegree)
						Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	BH-1	0.50	27410	1.69	-	-	-	-	-	-	rock	2360	-	-
2	BH-1	6.00	28544		-	-	-	-	-	-	rock	2250	-	-
3	BH01	9.80	27850								rock	2361		



Town Water Supply Office Building Site

S. No	TP-ID	Easting	Northing	Altitude (m)	Depth(m)
1	KWSOtp-01	512241	963887		1.50
2	KWSOtp-02	512240	963893		1.20

No	TP ID	Depth	Swelling	Sieve analysis			Atterberg Limits			Unit weight(kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (in degree)
				Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	KWSO TP1	1.50	80	-	-	-	-	-	MH	1834	14	19

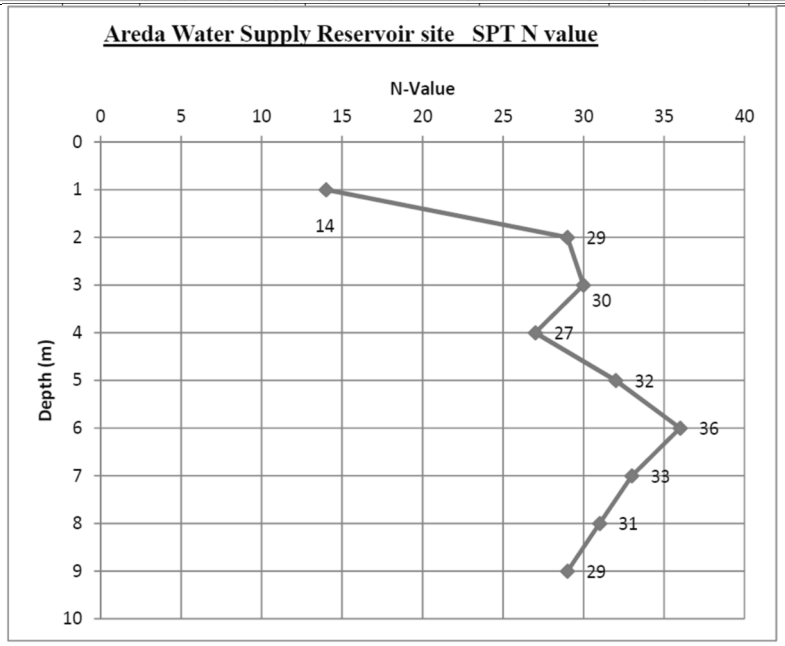
s.no	Test pit ID	Depth DCP conducted (m)	Converted SPT N-Value/layer	Corrected SPT N Value	Average of the depth	Average N value b/n .5B and 2B
1	KWSO TP1	surface	27	10	18	1st layer N value =20 2nd layer N value= 25
			15	18		
			10	26		
2	KWSO TP1	1.50	13	20	23	
			10	26		
3	KWSO TP2	surface	12	22	23	
			11	24		
4	KWSO TP2	1.20	21	13	26	
			13	20		
			6	44		

3. Areda

Water Supply Reservoir Site

S. No	BH-ID	Easting	Northing	Altitude (m)	Depth(m)
1	BH-1	530729	1005397	2547	10.0

No	BH ID	Depth	UCS (KN/m^2)	absorption	Specific gravity	Sieve analysis			Atterberg Limits			Unit weight(Kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (indegree)
						Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	BH-1	1.00 – 1.85	-	-	-	0	11	32&57	68.58	28.24	MH	1833	26	21
2	BH-1	3.20 – 4.00	-	-	-	-	-	-	-	-		1856	21	21



Town Water Supply Office Building Site

S. No	TP-ID	Easting	Northing	Altitude (m)	Depth(m)
1	AWSOTp-01	528537	1003793		1.20
2	AWSOTp-02	528533	1003807		1.15

No	TP ID	Depth	Swelling	Sieve analysis			Atterberg Limits			PH	Chloride (mg/lt)	Sulphate (mg/lt))
				Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	AWSR TP1	1.50	60	-	-	-	58.7	22.1	MH	6.8	4	3.20

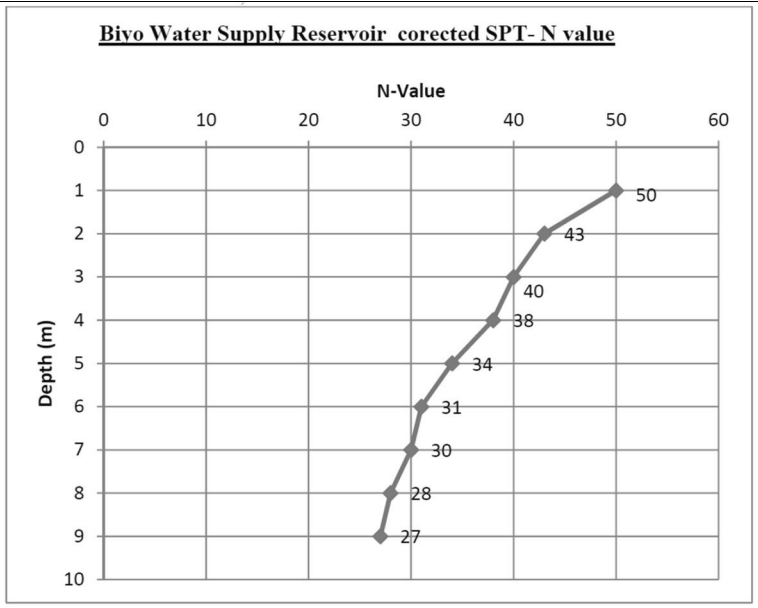
s.no	Test pit ID	Depth DCP conducted (m)	Converted SPT N-Value/layer	Corrected SPT N Value	Average of the depth	Average N value b/n .5B and 2B
1	AWSO TP1	surface	26	11	13	1st layer N value =10
			18	15		
2	AWSO TP1	1.20	21	13	19	
			10	24		
3	AWSO TP2	surface	37	7	7	2nd layer N value= 25
4	AWSO TP2	1.15	17	16	30	
			6	44		

4. Biyo

Water Supply Reservoir Site

S. No	BH-ID	Easting	Northing	Altitude (m)	Depth(m)
1	BH-1	508858	956304	1904	10.0

No	BH ID	Depth	UCS (KN/m^2)	absorption	Specific gravity	Sieve analysis			Atterberg Limits			Unit weight(Kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (indegree)
						Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	BH-1	1.47	29630	1.96	-	-	-	-	-	-	rock	2410	-	-
2	BH-1	9.83	23620		-	-	-	-	-	-	rock	2185	-	-



Town Water Supply Office Building Site

S. No	TP-ID	Easting	Northing	Altitude (m)	Depth(m)
1	BWSOTP01	508057	955803		1.00
2	BWSOTP02	508062	955798		1.25

No	TP ID	Depth	Chemical test of soil (BS 1377)			Sieve analysis			Atterberg Limits			Unit weight(kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (in degree)
			PH	Chloride (mg/lit)	Sulphate(mg/lit)	Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	BWSO TP1	1.10	-	-	-	-	-	-	46.30	12.10	M	-	-	-
	BWSO TP2	1.0	6.9	4.88	5.40	-	-	-	-	-	-	-	-	-

s.no	Test pit ID	Depth DCP conducted (m)	DCP (mm/below)	Corrected SPT N Value	Average of the depth	Average N value b/n .5B and 2B
1	BWSO TP1	surface	10	24	37	1st layer N value =36 2nd layer N value= 50
			5	50		
2	BWSO TP1	1.00	5	50	50	
			2	50		
3	BWSO TP2	surface	9	28	36	
			4	50		
4	BWSO TP2	1.25	5	50	50	
			2	50		

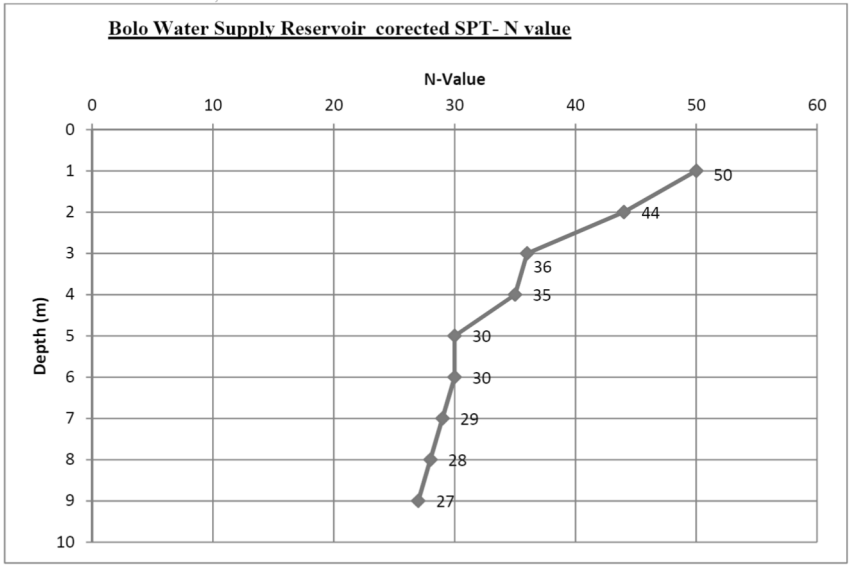
BWSO TP1= Biyo water supply office test pit 1

5. Bolo

Water Supply Reservoir Site

S. No	BH-ID	Easting	Northing	Altitude (m)	Depth(m)
1	BH-1	563750	910910	2569	10.0

No	BH ID	Depth	UCS (KN/m^2)	absorption	Sieve analysis			Atterberg Limits			Unit weight(Kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (in degree)
					Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	BH 01	1.60 - 1.87	26910	-	-	-	-	-	-	rock	2310	-	-
2	BH 01	5.0 - 5.40	31210	-	-	-	-	-	-	rock	2530	-	-
	BH 01	7.20 - 7.50	27500	2.15	-	-	-	-	-	rock	2444	-	-



Town Water Supply Office Building Site

S. No	TP-ID	Easting	Northing	Altitude (m)	Depth(m)
1	BLWSOTP-1	563852	911268		1.00
2	BLWSOTP-1	563859	911260		0.90

No	TP ID	Depth	Chemical test of soil (BS 1377)			Sieve analysis			Atterberg Limits			Unit weight(kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (in degree)
			PH	Chloride (mg/lit)	Sulphate(mg/lit)	Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	BLWSO TP1	0.60	-	-	-	-	-	-	71.40	29.20	MH	-	-	-
	BLWSO TP2	0.90	6.8	3.36	2.80	-	-	-	-	-	-	-	-	-

s.no	Test pit ID	Depth DCP conducted (m)	DCP (mm/below)	Corrected SPT N Value	Average of the depth	Average N value b/n .5B and 2B
1	BLWSO TP1	surface	22	12	28	1st layer N value =26
			6	44		
2	BLWSO TP1	0.90	7	38	44	
			5	50		
3	BLWSO TP2	surface	10	24	24	2nd layer N value= 44
4	BLWSO TP2	0.10	7	38	44	
			5	50		

BLWSO TP1= Bolo water supply office test pit 1

6. Aseko

Water Supply Reservoir Site

S. No	BH-ID	Easting	Northing	Altitude (m)	Depth(m)
1	AWSR TP-01	612602	939362	2171	1.50
2	AWSR TP-02	612600	939357	2171	1.50

No	TP ID	Depth	Specific gravity	Sieve analysis			Atterberg Limits			Unit weight(kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (in degree)
				Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	AWSR TP1	1.50	-	-	6	32&62	53.6	21.1	MH	1830	20	21
2	AWSR TP1	1.50	-	-	-	-	48.5	19.5	MH	1874	23	21

s.no	Test pit ID	Depth DCP conducted (m)	Converted SPT N-Value/layer	Corrected SPT N Value	Average of the depth	Average N value b/n .5B and 2B
1	AWSR TP1	surface	15	15	12	12
			9	9		
2	AWSR TP1	1.50	9	9	13	
			17	17		
			12	12		
3	AWSR TP2	surface	10	10	10	
4	AWSR TP2	1.50	10	10	13	
			13	13		
			17	17		

Town Water Supply Office Building Site

S. No	TP-ID	Easting	Northing	Altitude (m)	Depth(m)
1	ASWSO TP-01	612833	940133		1.50
2	ASWSO TP-02	612828	940134		1.20

No	TP ID	Depth	swelling	Sieve analysis			Atterberg Limits			Unit weight(kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (in degree)	Soil Chemical test		
				Gravel	Sand	Silt & Clay	LL	PI	Soil Class				ph	chloride	Sulphate (mg/l)
1	ASWSR TP1	1.0	90	2	27	81	67.70	26.20	MH	1840	25	18	6.90	4.88	5.40

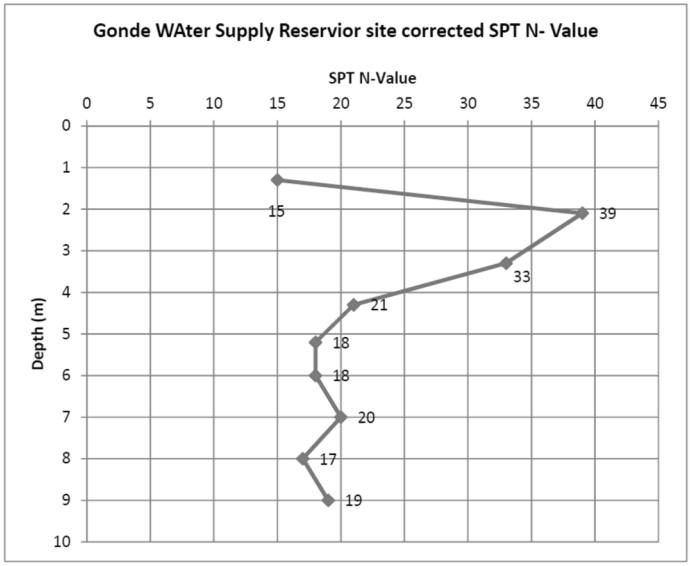
s.no	Test pit ID	Depth DCP conducted (m)	Converted SPT N-Value/layer	Corrected SPT N Value	Average of the depth	Average N value b/n .5B and 2B
1	ASWSR TP1	surface	22	12	16	18
			13	20		
2	ASWSR TP1	1.50	16	17	20	
			12	22		
3	ASWSR TP2	surface	19	14	14	
4	ASWSR TP2	1.50	15	18	23	
			9	28		

7. Gonde

Water Supply Reservoir Site

S. No	BH-ID	Easting	Northing	Altitude (m)	Depth(m)
1	BH-1	521542	886610	2359	10.0

No	BH ID	Depth	Specific gravity	Sieve analysis			Atterberg Limits			Unit weight(Kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (indegree)
				Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	BH-1	2.80 - 3.60	-	0	23	30&47	53.6	22.35	MH	1870	26	21
2	BH-1	5.00 - 5.60	-	-	-	-	-	-		1816	29	20
3	BH-1	7.20 – 8.00	-	-	21	34&45	-	-		-	-	-



Town Water Supply Office Building Site

S. No	TP-ID	Easting	Northing	Altitude (m)	Depth(m)
1	GWSTP-1	520626	887855		1.10
2	GWSTP-1	520619	887862		1.15

No	TP ID	Depth	Chemical test of soil (BS 1377)			Sieve analysis			Atterberg Limits			Unit weight(kg/m^3)	Cohesion (kN/m^2)	Angle of internal friction (in degree)
			PH	Chloride	Sulphate	Gravel	Sand	Silt & Clay	LL	PI	Soil Class			
1	GWSO TP1	1.10	6.9	3.74	4.41	21	20	59	NP	NP	M	1829	13	21

s.no	Test pit ID	Depth DCP conducted (m)	DCP (mm/below)	Corrected SPT N Value	Average of the depth	Average N value b/n .5B and 2B
1	GWSO TP1	surface	18	15	22	1st layer N value =26 2nd layer N value= 33
			9	28		
2	GWSO TP1	1.10	12	22	33	
			6	44		
3	GWSO TP2	surface	16	16	30	
			6	44		
4	GWSO TP2	1.15	14	18	34	
			3	50		

GWSO TP1=Gonde water supply office test pit 1

7(7) 社会調査結果

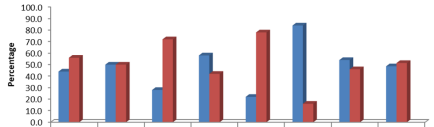
3. Findings

3.1 Household Survey

3.1.1 Demographic Characteristics of Respondents and General Information of Households

3.1.1.1 Gender Compositions of Respondents

Figure 1 captures gender composition of respondents in the seven small towns. Accordingly, in Aseko town, 56.0% are females and 44.0% are males. In Bolo town, equal number of respondents (gender wise) had participated in the survey (i.e., 50.0% females and 50.0% males). It is in Gonde and Areda towns where relatively larger number of females had participated in the survey (72.0% and 78.0%, respectively). But in Biyo town, the proportion of female respondents is very low (16.0%) and consequently the proportion of male respondents is high (84.0%). The proportions of female respondents are lower than that of male counterparts in Ude Dhankaka and Kamise towns (42.0% and 46.0%, respectively).



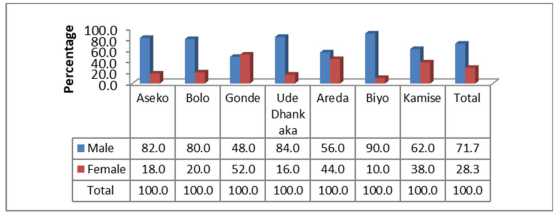
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Male	44.0	50.0	28.0	58.0	22.0	84.0	54.0	48.6
Female	56.0	50.0	72.0	42.0	78.0	16.0	46.0	51.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 1: Gender compositions of respondents

Source: Household Survey Data, December/2019 –January/2020

3.1.1.2 Gender of Household Heads

Figure 2 presents sex of heads of the households contacted for the interview for the seven small towns. In this regard, the proportions of female headed households covered by the survey are lower in Aseko, Bolo, Ude Dhankaka and Biyo towns (18.0%, 20.0%, 16.0% and 10.0% in that order) while the proportion of female headed households exceeded that of males in Gonde town (52.0% to 48.0%). The proportion of female headed households contacted for the interview in Areda town (44.0%) is also relatively high from the view point of household leadership.



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Male	82.0	80.0	48.0	84.0	56.0	90.0	62.0	71.7
Female	18.0	20.0	52.0	16.0	44.0	10.0	38.0	28.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 2: Gender of household heads

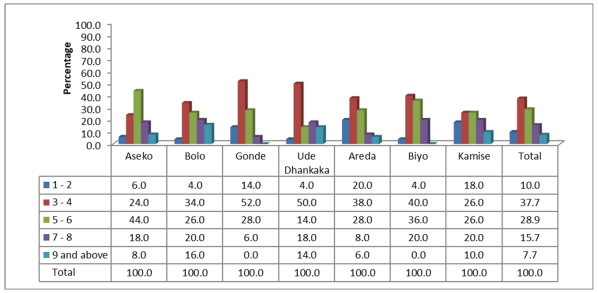
Source: Household Survey Data, December/2019 –January/2020

3.1.1.3 Household Size

Households were also requested to mention total number of their family members (household size). As captured by figure 3, relatively

larger proportions of the households are with 3 – 4 family members in Bolo (34.0%), Gonde (52.0%), Ude Dhankaka (50.0%), Areda (38.0%) and Biyo (40.0%) while it is 5 – 6 family members for Aseko (44.0%). For Kamise, households with 3 – 4 and 5 – 6 family members comprise 52.0%.

While the average household sizes vary from 4 – 6, the median household size is 4 in Gonde, Ude Dhankaka and Areda towns while it is 5 for the other towns. A maximum household size (18) is reported in Bolo town (table 3).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 2	6.0	4.0	14.0	4.0	20.0	4.0	18.0	10.0
3 - 4	24.0	34.0	52.0	50.0	38.0	40.0	26.0	37.7
5 - 6	44.0	26.0	28.0	14.0	28.0	36.0	26.0	28.9
7 - 8	18.0	20.0	6.0	18.0	8.0	20.0	20.0	15.7
9 and above	8.0	16.0	0.0	14.0	6.0	0.0	10.0	7.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 3: Household size

Source: Household Survey Data, December/2019 –January/2020

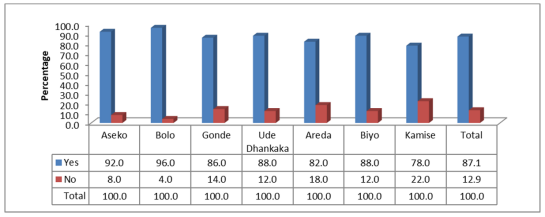
Table 1: Statistics on household size (persons)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	1	5.5	5	10	9	50
Bolo	2	6.1	5	18	16	50
Gonde	1	4.1	4	7	6	50
Ude Dhankaka	2	5.4	4	12	10	50
Areda	1	4.3	4	10	9	50
Biyo	2	5.0	5	8	6	50
Kamise	2	5.2	5	12	10	50

Source: Household Survey Data, December/2019 –January/2020

3.1.1.4 Children Under 18 Years Old

Regarding child family members of those below the age of 18 years, the finding (figure 4) reveals that more than 75.0% of the households in all the 7 small towns reported that there are child family members of the stated ages while the percentage is as high as 96.0% in Bolo followed by Aseko (92.0%).

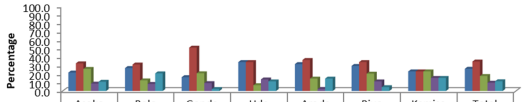


	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Yes	92.0	96.0	86.0	88.0	82.0	88.0	78.0	87.1
No	8.0	4.0	14.0	12.0	18.0	12.0	22.0	12.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 4: Children under 18 years old

Source: Household Survey Data, December/2019 –January/2020

Regarding number of such children in the household, as shown in figure 5, relatively large proportion of respondents in Aseko indicated that there are two children in the household (32.6%) followed by three children (26.1%). In Bolo town, 31.3% indicated that there are two children in the household followed by one child (27.1%). Those with 5 and above make 20.8%. In Gonde town, 51.2% indicated that there are two children of the age in reference. In Ude Dhankaka town, 34.1% indicated that there is one child in the family while same proportion (34.1%) indicated existence of two children. In Areda town, 36.6% indicated two children in the family while 31.7% indicated existence of one child. In Biyo town, 34.1% indicated two children in the family while 29.6% indicated existence of one child. In Kamise town, 23.1% indicated existence of one child and same proportions indicated 2 and 3 children. The median is 3 for Kamise but 2 for the remaining towns (table 4).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
One	21.7	27.1	16.3	34.1	31.7	29.6	23.1	26.2
Two	32.6	31.3	51.2	34.1	36.6	34.1	23.1	34.8
Three	26.1	12.5	20.9	6.8	14.6	20.5	23.1	17.7
Four	8.7	8.3	9.3	13.6	2.4	11.4	15.4	9.8
Five & above	10.9	20.8	2.3	11.4	14.6	4.6	15.4	11.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 5: Number of children under 18 years old

Source: Household Survey Data, December/2019 –January/2020

Table 2: Statistics on number of children under 18 years old (persons)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	1	2.7	2	7	6	46
Bolo	1	3.3	2	16	15	48
Gonde	1	2.3	2	5	4	43
Ude Dhankaka	1	2.5	2	8	7	44
Areda	1	2.4	2	8	7	41
Biyo	1	2.3	2	5	4	44
Kamise	1	2.9	3	7	6	39

Source: Household Survey Data, December/2019 –January/2020

3.1.1.5 Ethnic Group of Respondents

Ethnicity wise, as shown in table 5, the majorities of the respondents are Oromos for Bolo (98.0), Gonde (58.0%), Ude Dhankaka (76.0%), Biyo (86.0%) and Kamise (66.0%) while Amharas in Aseko (68.0%) and Areda (82.0%). Mixed ethnicity (either mother is Oromo and father is Amhara, or father is Oromo and mother is Amhara) is also reported and others including Hadiya and Silte. Note that the data collected in regard to mixed ethnicity refers to ethnic group of the respondent.

Table 3: Distribution by ethnic group (%)

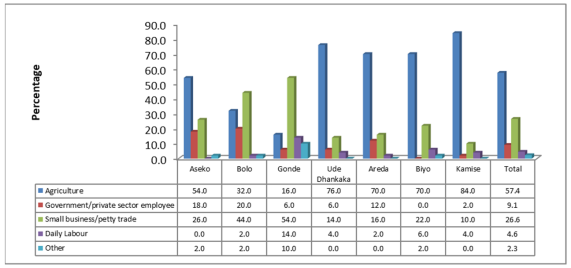
Ethnic Group	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Oromo	32.0	98.0	58.0	76.0	18.0	86.0	66.0	62.0
Amhara	68.0	2.0	32.0	18.0	82.0	14.0	30.0	35.1
Other	0.0	0.0	10.0	6.0	0.0	0.0	4.0	2.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Other Ethnic Groups (Hadiya (1), Oromo & Amhara (5), Silte (4))

Source: Household Survey Data, December/2019 –January/2020

3.1.1.6 Main Economic Activity of the Households

Regarding major economic activity of the households, the finding (figure 6) reveals that Agriculture is the main activity in Kamise (84.0%), Ude Dhankaka (76.0%), Areda & Biyo (70.0% each), and Aseko (54.0%). Small businesses / petty trading are also mentioned as the main activities in Gonde (54.0%) and Bolo (44.0%).



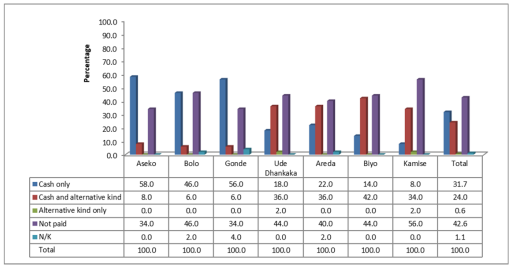
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Agriculture	54.0	32.0	16.0	76.0	70.0	70.0	84.0	57.4
Government/private sector employee	18.0	20.0	6.0	6.0	12.0	0.0	2.0	9.1
Small business/petty trade	26.0	44.0	54.0	14.0	16.0	22.0	10.0	26.6
Daily Labour	0.0	2.0	14.0	4.0	2.0	6.0	4.0	4.6
Other	2.0	2.0	10.0	0.0	0.0	2.0	0.0	2.3

Figure 6: Distribution of households by main economic activity

Source: Household Survey Data, December/2019 –January/2020

3.1.1.7 Income Earning Modality

As captured by figure 7, majorities of family members of the households earn income from their economic activities in cash in Aseko (58.0%), Gonde (56.0%) and Bolo (46.0%) while in the form of cash and alternative kind in Biyo (42.0%), Ude Dhankaka (36.0%), Areda (36.0%) and Kamise (34.0%).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Cash only	58.0	46.0	56.0	18.0	22.0	14.0	8.0	31.7
Cash and alternative kind	8.0	6.0	6.0	36.0	36.0	42.0	34.0	24.0
Alternative kind only	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.6
Not paid	34.0	46.0	34.0	44.0	40.0	44.0	56.0	42.6
N/K	0.0	2.0	4.0	0.0	2.0	0.0	0.0	1.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 7: Distribution of households by income earning modality

Source: Household Survey Data, December/2019 –January/2020

3.1.1.8 Household Cash Income

Regarding annual household cash income, the finding (figure 8) reveals that relatively larger proportions of the households earn either Birr 12,000 and below or Birr 48,000 and above. The minimum is as small as Birr 600 (in Gonde) while the maximum is as big as Birr 250,000 (in Bolo and Biyo). In fact, the median income is in the margin of Birr 12,000 to Birr 30,000 (table 6).

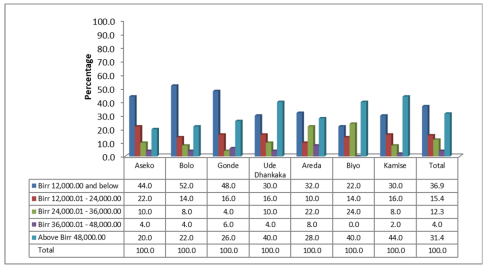


Figure 8: Distribution of households by annual income

Source: Household Survey Data, December/2019 –January/2020

Table 4: Statistics on household annual income (Birr)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	2,000.00	27,453.92	15,800.00	120,000.00	118,000.00	50
Bolo	1,000.00	29,865.68	12,000.00	250,000.00	249,000.00	50
Gonde	600.00	27,313.04	14,000.00	120,000.00	119,400.00	50
Ude Dhankaka	5,000.00	42,253.60	30,000.00	150,000.00	145,000.00	50
Areda	1,000.00	31,138.72	25,618.00	100,000.00	99,000.00	50
Biyo	2,000.00	45,050.00	30,000.00	250,000.00	248,000.00	50
Kamise	1,000.00	44,650.00	27,500.00	200,000.00	199,000.00	50

Source: Household Survey Data, December/2019 –January/2020

Table 7 captures distribution of households by income category and sex of the household head for all the seven small towns.

Table 5: Distribution of households by income and sex of the household head (%)

Sex of household head	Annual Household Income	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Male	Birr 12,000.00 and below	43.9	47.5	29.2	26.2	21.4	24.4	19.4	31.1
	Birr 12,000.01 - 24,000.00	22.0	15.0	16.7	14.3	10.7	15.6	19.4	16.3
	Birr 24,000.01 - 36,000.00	7.3	10.0	4.2	11.9	17.9	22.2	3.2	11.6
	Birr 36,000.01 - 48,000.00	2.4	2.5	8.3	4.8	14.3	0.0	3.2	4.4
	Above Birr 48,000.00	24.4	25.0	41.7	42.9	35.7	37.8	54.8	36.7
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Female	Birr 12,000.00 and below	44.4	70.0	65.4	50.0	45.5	0.0	47.4	51.5
	Birr 12,000.01 - 24,000.00	22.2	10.0	15.4	25.0	9.1	0.0	10.5	13.1
	Birr 24,000.01 - 36,000.00	22.2	0.0	3.8	0.0	27.3	40.0	15.8	14.1
	Birr 36,000.01 - 48,000.00	11.1	10.0	3.8	0.0	0.0	0.0	0.0	3.0
	Above Birr 48,000.00	0.0	10.0	11.5	25.0	18.2	60.0	26.3	18.2
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

Distribution of households in Aseko by sex of household head (figure 9) reveals that majority of both male and female headed households earn a maximum of 12,000 Birr annually (43.9% of male and 44.4% of female) while 24.4% of female headed households earn above Birr 48,000.

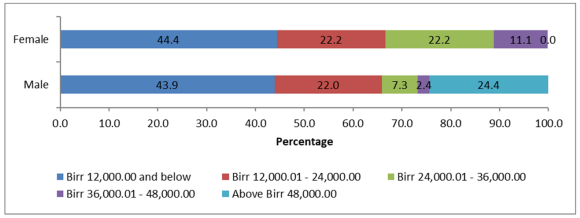


Figure 9: Household income and sex of household head in Aseko

Source: Household Survey Data, December/2019 –January/2020

In Bolo (figure 10), the large majority of female headed households (70.0%) earn a maximum of 12,000 Birr annually while the proportion of their male counterparts with similar income range is 47.5% followed by those who earn above Birr 48,000 (25.0%).

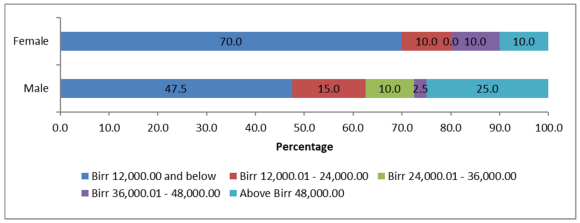


Figure 10: Household income and sex of household head in Bolo

Source: Household Survey Data, December/2019 –January/2020

In Gonde (figure 11), the large majority of female headed households (65.4%) earn a maximum of Birr 12,000 annually while the proportion of their male counterparts with similar income range is 29.2%. A large proportion of male headed households (41.7%) earn above Birr 48,000.

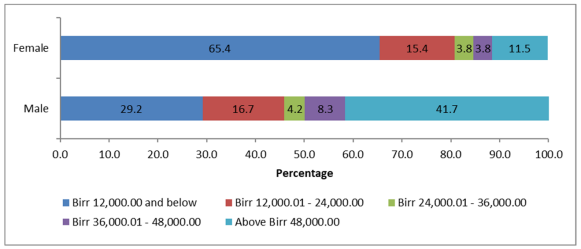


Figure 11: Household income and sex of household head in Gonde

Source: Household Survey Data, December/2019 –January/2020

In Ude Dhankaka (figure 12), half of female headed households earn a maximum of Birr 12,000 annually while the proportion of their male counterparts with similar income range is 26.2%. A large proportion of male headed households (42.9%) earn above Birr 48,000.

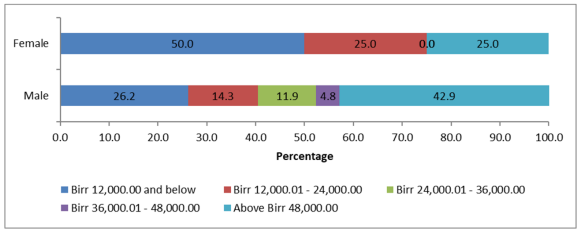


Figure 12: Household income and sex of household head in Ude Dhankaka

Source: Household Survey Data, December/2019 –January/2020

In Areda (figure 13), the large majority of female headed households (45.5%) earn a maximum of Birr 12,000 annually while the proportion of their male counterparts with similar income range is 21.4%. A large proportion of male headed households (35.7%) earn above Birr 48,000.

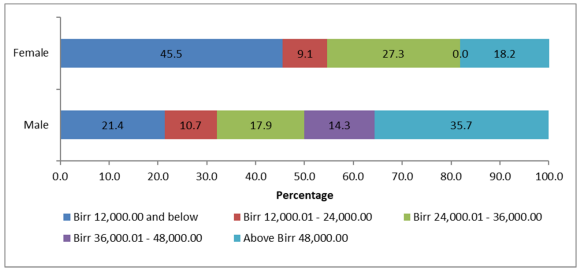


Figure 13: Household income and sex of household head in Areda

Source: Household Survey Data, December/2019 –January/2020

In Biyo (figure 14), the large majority of female headed households (60.0%) earn above Birr 48,000 annually while the proportion of their male counterparts with similar income range is 37.8%.

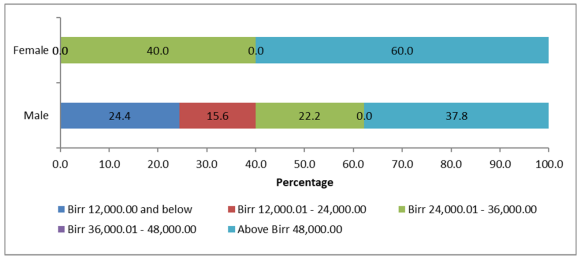


Figure 14: Household income and sex of household head in Biyo

Source: Household Survey Data, December/2019 –January/2020

In Kamise (figure 15), the large majority of female headed households (47.4%) earn a maximum of Birr 12,000 annually while the proportion of their male counterparts with similar income range is 19.4%. A large proportion of male headed households (54.8%) earn above Birr 48,000.

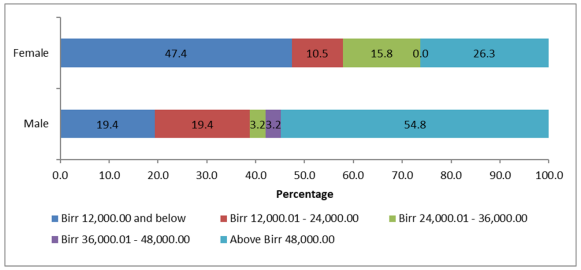


Figure 15: Household income and sex of household head in Kamise

Source: Household Survey Data, December/2019 –January/2020

3.1.1.9 Livestock Ownership

Households were also requested to specify their livestock ownership. The finding (table 8) reveals ownership of at least one of each kind in all the seven small towns except Horse that is not mentioned by households in Aseko.

Table 6: Distribution of households by livestock ownership (number of livestock owned)

Town	Livestock Type	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	Cattle/Heads	1	3	2	7	6	29
	Goat/Heads	1	3	3	7	6	14
	Sheep/Heads	1	3	2	5	4	9
	Donkey/Heads	1	1	1	2	1	22
	Horse/Heads	0	0	0	0	0	0
	Chicken/Heads	1	3	2	10	9	25
	Other/Heads	0	0	0	0	0	0
Bolo	Cattle/Heads	1	4	3	15	14	24
	Goat/Heads	1	3	3	7	6	10
	Sheep/Heads	1	6	5	20	19	12
	Donkey/Heads	1	1	1	2	1	6
	Horse/Heads	2	2	2	2	0	2
	Chicken/Heads	1	5	3	12	11	13
	Other/Heads	0	0	0	0	0	0
Gonde	Cattle/Heads	1	2	2	4	3	14
	Goat/Heads	1	2	2	2	1	2
	Sheep/Heads	1	4	3	10	9	11
	Donkey/Heads	1	1	1	1	0	3
	Horse/Heads	1	1	1	1	0	1
	Chicken/Heads	1	2	2	4	3	11
	Other/Heads	0	0	0	0	0	0
Ude Dhankaka	Cattle/Heads	1	7	4	95	94	36
	Goat/Heads	1	1	1	1	0	2
	Sheep/Heads	2	5	4	11	9	11
	Donkey/Heads	1	2	2	4	3	22
	Horse/Heads	1	1	1	2	1	8
	Chicken/Heads	2	22	4	250	248	22
	Other/Heads	0	0	0	0	0	0
Areda	Cattle/Heads	1	3	3	7	6	32
	Goat/Heads	1	3	4	5	4	5
	Sheep/Heads	2	4	3	10	8	17
	Donkey/Heads	1	2	1	3	2	26
	Horse/Heads	1	1	1	1	0	4

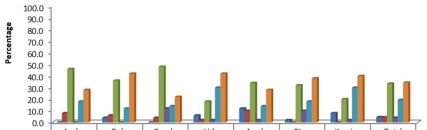
Town	Livestock Type	Minimum	Mean	Median	Maximum	Range	Valid N
	Chicken/Heads	1	5	4	30	29	28
	Other/Heads	0	0	0	0	0	0
Biyo	Cattle/Heads	1	4	4	10	9	39
	Goat/Heads	2	5	3	14	12	7
	Sheep/Heads	1	4	3	12	11	13
	Donkey/Heads	1	2	2	4	3	24
	Horse/Heads	1	1	1	1	0	6
	Chicken/Heads	2	9	8	20	18	28
	Other/Heads	0	0	0	0	0	0
Kamise	Cattle/Heads	1	6	5	16	15	34
	Goat/Heads	2	4	4	10	8	11
	Sheep/Heads	2	8	6	20	18	11
	Donkey/Heads	1	2	2	5	4	34
	Horse/Heads	1	1	1	1	0	4
	Chicken/Heads	1	8	6	20	19	29
	Other/Heads	0	0	0	0	0	0

Source: Household Survey Data, December/2019 –January/2020

3.1.2 Gender Issues

3.1.2.1 Major Economic Activities of Female Household Members

Regarding involvement of female household members in economic activities, the finding reveals that women mainly engage in small household businesses including petty trade (figure 16). Majority of female household members in Bolo (42.0%), Ude Dhankaka (42.0%) and Kamise (40.0%) don't have any economic activity.



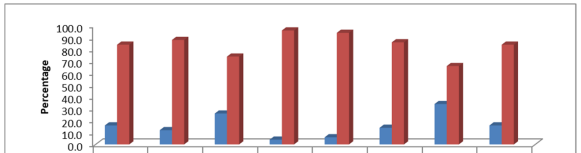
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Agriculture	0.0	4.0	0.0	6.0	12.0	2.0	8.0	4.6
Government/private sector employee	8.0	6.0	4.0	2.0	10.0	0.0	0.0	4.3
Small business/petty trade	46.0	36.0	48.0	18.0	34.0	32.0	20.0	33.4
Daily Labour	0.0	0.0	12.0	2.0	2.0	10.0	2.0	4.0
Other (House Wife, etc)	18.0	12.0	14.0	30.0	14.0	18.0	30.0	19.4
N/A	28.0	42.0	22.0	42.0	28.0	38.0	40.0	34.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 16: Major economic activities of female household members

Source: Household Survey Data, December/2019 –January/2020

3.1.2.2 Female Household Members Roles in Water Committee

Regarding participation of female household members in water committees, the finding shows such experiences are not common in all the seven towns covered by this study even though the situation is better in Kamise (34.0%) and Gonde (26.0%) (figure 17) for being at least a member (table 9).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Yes	16.0	12.0	26.0	4.0	6.0	14.0	34.0	16.0
No	84.0	88.0	74.0	96.0	94.0	86.0	66.0	84.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 17: Female household members roles in water committee

Source: Household Survey Data, December/2019 –January/2020

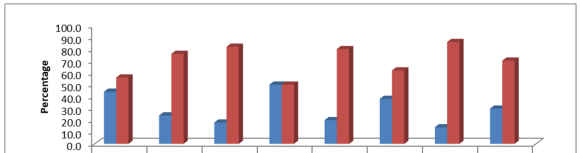
Table 7: Type of roles (number of responses)

Roles	Town							Total
	Areda	Aseko	Biyo	Bolo	Gonde	Kamise	Ude Dhankaka	
Committee Member of Fuel & Electricity Sources	1	0	0	0	0	0	0	1
Member	2	7	6	5	13	17	1	51
Water Use Association Committee Member	0	0	1	1	0	0	1	3
Zonal Facilitator	0	1	0	0	0	0	0	1
Total	3	8	7	6	13	17	2	56

Source: Household Survey Data, December/2019 –January/2020

3.1.2.3 Female Household Members Roles in Community or Village

Unlike women participation in water committees, the participation of women in community or village matters is better in all the seven towns. The situation is even better in Ude Dhankaka (50.0%) Aseko (44.0%) and Biyo (38.0%) towns (figure 18) with roles that include idir membership, idir chairperson, etc (table 10).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Yes	44.0	24.0	18.0	50.0	20.0	38.0	14.0	29.7
No	56.0	76.0	82.0	50.0	80.0	62.0	86.0	70.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 18: Female household members roles in community or village

Source: Household Survey Data, December/2019 –January/2020

Table 8: Female social roles (number of responses)

Other Social Roles	Town						
	Areda	Aseko	Biyo	Bolo	Gonde	Kamise	Ude Dhankaka
Cabinet Member	0	1	0	0	0	0	0
Cashier for community gatherings	0	0	0	0	0	1	0
Cashier for CSO (civil society organization)	0	0	0	0	0	0	1

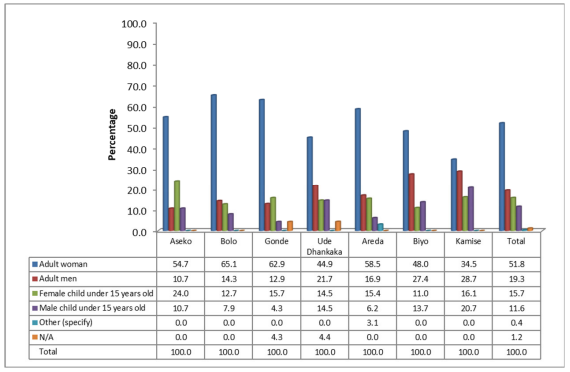
Other Social Roles	Town						
	Areda	Aseko	Biyo	Bolo	Gonde	Kamise	Ude Dhankaka
Cashier for Ikub (Local Saving Structure)	0	0	0	0	0	1	0
Chairperson of CSO	0	0	0	0	0	0	1
Church Member	0	1	0	0	0	0	0
Committee Member of Community Savings (saving structure at community level)	0	0	0	1	0	0	0
Community Court	0	0	1	0	0	0	0
Community Insurance Services	0	0	0	0	0	1	0
Community Saving Organization Member	0	0	0	0	0	0	1
CSO Secretary	0	0	0	0	0	0	1
CSO Store Keeper	0	0	0	0	0	0	2
Harmful Traditional Practices (HTPs) Focal	0	0	0	0	0	0	1
Idir Chairperson	0	0	3	0	0	0	0
Idir Control Committee	0	0	2	0	0	0	0
Idir Member	9	7	9	6	2	1	17
Idir Secretary	0	0	0	1	0	0	0
Ikub (Local Saving Structure) Chairperson	0	1	0	0	0	0	0
Judge	0	0	0	0	1	0	0
Member of CSO	1	9		3	3	0	0
PTA Member	0	0	0	0	0	1	0
Saving Group Cashier	0	1	0	0	0	0	0
Saving Group Controller	0	1	0	0	0	2	0
Secretary of Women CSO	0	0	0	0	1	0	0
Store Keeper of Idir (Local Community Structure)	0	0	4	0	1	0	0
Wedding Service Provider	0	0	0		1	0	0
Women Affairs Cabinet	0	0	0	1	0	0	0
Women Group Leader	0	1	0	0	0	0	0
Women Right Committee Member	0	0	0	0	0	0	1

Note that Idir is a self-help structure formed by interested local community members.

Source: Household Survey Data, December/2019 –January/2020

3.1.2.4 Responsibility of Household Members in Fetching Water

The finding (figure 19) reveals that fetching water is more the responsibility of adult women (with a minimum of 34.5% in Kamise and maximum of 65.1% in Bolo) followed by adult men (with a minimum of 10.7% in Aseko and maximum of 28.7% in Kamise) and female child under 15 years (within the range of 11.0% in Biyo and 24.0% in Aseko). Male children under 15 years are also mentioned in Kamise (20.7%), Ude Dhankaka (14.5%) and Biyo (13.7%).



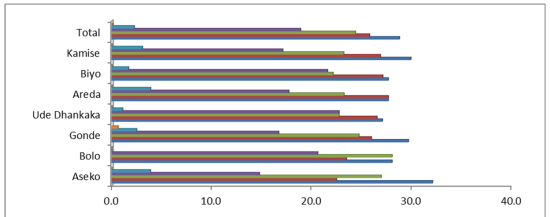
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Adult woman	54.7	65.1	62.9	44.9	58.5	48.0	34.5	51.8
Adult men	10.7	14.3	12.9	21.7	16.9	27.4	28.7	19.3
Female child under 15 years old	24.0	12.7	15.7	14.5	15.4	11.0	16.1	15.7
Male child under 15 years old	10.7	7.9	4.3	14.5	6.2	13.7	20.7	11.6
Other (specify)	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.4
N/A	0.0	0.0	4.3	4.4	0.0	0.0	0.0	1.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 19: Responsibility of household members in fetching water

Source: Household Survey Data, December/2019 –January/2020

3.1.2.5 Major Domestic Duties

Regarding domestic duties of family members, the finding reveals that the major ones for all the towns are cooking (from 27.0% in Ude Dhankaka to 32.1% in Aseko), laundry (from 22.4% in Aseko to 27.6% in Areda) and fetching water (from 22.1% in Biyo to 28.0% in Bolo) in that order (figure 20). Child care is also mentioned as domestic duty of family members by 22.7% in Ude Dhankaka, 21.6% in Biyo and 20.6% in Bolo.



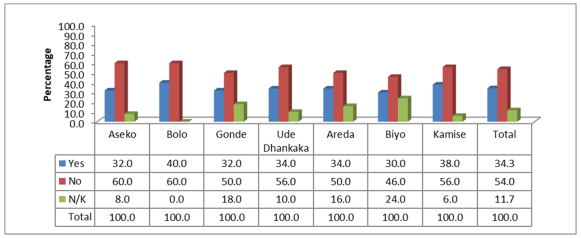
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
N/A	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.1
Other (specify)	3.9	0.0	2.5	1.1	3.9	1.7	3.1	2.2
Child care	14.7	20.6	16.7	22.7	17.7	21.6	17.1	18.9
Fetching water	26.9	28.0	24.7	22.7	23.2	22.1	23.2	24.3
Laundry	22.4	23.4	25.9	26.5	27.6	27.1	26.8	25.8
Cooking	32.1	28.0	29.6	27.0	27.6	27.6	29.9	28.7

Figure 20: Major domestic duties

Source: Household Survey Data, December/2019 –January/2020

3.1.2.6 Whether Women's Opinions are Fairly Reflected in the Operation and Maintenance of Water Supply Facilities

Regarding whether women's opinions are fairly reflected in the operation and maintenance of water supply facilities, the finding (figure 21) reveals that participation of women in the operation and maintenance of water supply facilities is not that much common in all the seven towns (with 46.0% in Biyo to 60.0% in Aseko and Bolo).



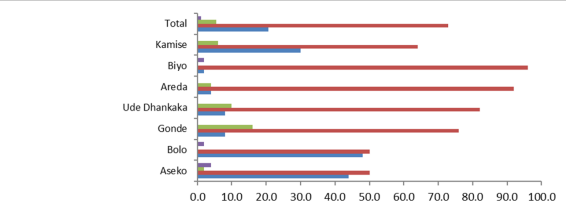
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Yes	32.0	40.0	32.0	34.0	34.0	30.0	38.0	34.3
No	60.0	60.0	50.0	56.0	50.0	46.0	56.0	54.0
N/K	8.0	0.0	18.0	10.0	16.0	24.0	6.0	11.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 21: Whether women's opinions are fairly reflected in the operation and maintenance of water supply facilities

Source: Household Survey Data, December/2019 –January/2020

3.1.2.7 Whether Some Female Family Members Got into Danger during Travels for Fetching Water

Regarding whether female family members got into danger during travels for fetching water, the danger is not more frequent in Biyo, Areda, Ude Dhankaka and Gonde towns while there are such incidences in Kamise (30%), Bolo (48.0%) and Aseko (44.0%) (Figure 22).



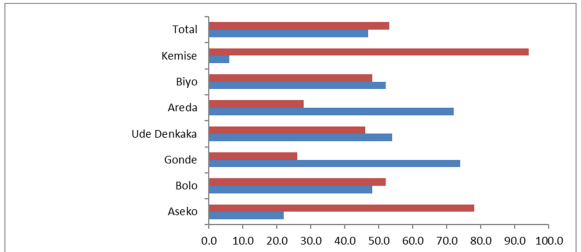
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
N/K	4.0	2.0	0.0	0.0	0.0	2.0	0.0	1.1
Never travel for fetching water (use private connection)	2.0	0.0	16.0	10.0	4.0	0.0	6.0	5.4
No	50.0	50.0	76.0	82.0	92.0	96.0	64.0	72.9
Yes	44.0	48.0	8.0	8.0	4.0	2.0	30.0	20.6

Figure 22: Whether some female family members got into danger during travels for fetching water

Source: Household Survey Data, December/2019 –January/2020

3.1.2.8 Whether Existing Water Supply Facilities are User Friendly Designed for Female and Children

Regarding whether the existing water supply facilities are user friendly designed for female and children, user friendliness (figure 23) is not much common in Kamise (94.0%) and Aseko (78.0). The situations in Bolo (52.0%), Biyo (48.0%) and Ude Dhankaka (46.0%) also show that nearly half of the existing water supply facilities are not user friendly designed in these three towns.



	Aseko	Bolo	Gonde	Ude Denkaka	Areda	Biyo	Kemise	Total
No, not user-friendly for female and children	78.0	52.0	26.0	46.0	28.0	48.0	94.0	53.1
Yes, no problem (well designed)	22.0	48.0	74.0	54.0	72.0	52.0	6.0	46.9

Figure 23: Whether existing water supply facilities are user friendly designed for female and children

Source: Household Survey Data, December/2019 –January/2020

3.1.3 Water, Sanitation and Hygiene Issues

3.1.3.1 Water Supply

3.1.3.1.1 Main Water Source for Drinking During Dry Season

The finding (table 11 and depicted by figure 24) reveals that the main water source for drinking in Aseko during dry season is protected spring (46.0%) followed by unprotected spring (42.0%). It is public tap/standpipe (66.0%) in Bolo and a mix of different sources in Gonde (piped into dwelling (36.0%), piped to neighbor (30.0%) and public tap/standpipe (20.0%)). It is protected well in Ude Dhankaka (60.0%) followed by piped to neighbor (26.0%). In Areda, it is piped to neighbor (42.0%) followed by piped into dwelling (24.0%). In Biyo, it is piped to neighbor (48.0%) followed by unprotected well (24.0%) while it is mainly surface water (river/dam/lake/pond/ stream/canal/irrigation channel) in Kamise (82.0%).

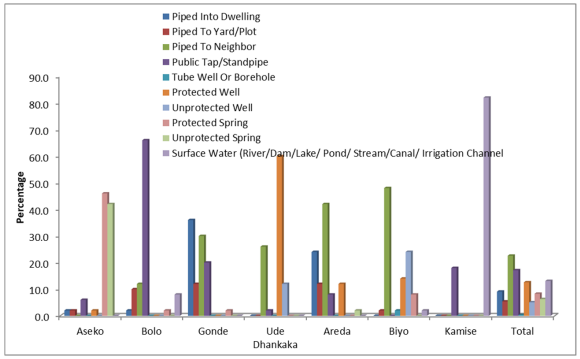


Figure 24: Main water source for drinking during dry season

Source: Household Survey Data, December/2019 –January/2020

Table 9: Main water source for drinking during dry season (%)

Water Source	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Piped Into Dwelling	2.0	2.0	36.0	0.0	24.0	0.0	0.0	9.1
Piped To Yard/Plot	2.0	10.0	12.0	0.0	12.0	2.0	0.0	5.4
Piped To Neighbor	0.0	12.0	30.0	26.0	42.0	48.0	0.0	22.6
Public Tap/Standpipe	6.0	66.0	20.0	2.0	8.0	0.0	18.0	17.1
Tube Well Or Borehole	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.3
Protected Well	2.0	0.0	0.0	60.0	12.0	14.0	0.0	12.6
Unprotected Well	0.0	0.0	0.0	12.0	0.0	24.0	0.0	5.1
Protected Spring	46.0	2.0	2.0	0.0	0.0	8.0	0.0	8.3
Unprotected Spring	42.0	0.0	0.0	0.0	2.0	0.0	0.0	6.3
Rainwater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tanker Truck (Boti)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cart with Small Tank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Water (River/Dam/Lake/ Pond/ Stream/Canal/ Irrigation Channel	0.0	8.0	0.0	0.0	0.0	2.0	82.0	13.1
Bottled Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (Specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.2 Main Water Source for Other Purposes Such as Cooking and Hand Washing During Dry Season

In this regard, the finding (table 12 and figure 25) reveals that the main water source for other purposes such as cooking and hand washing during dry season in Aseko is unprotected spring (50.0%) followed by protected spring (34.0%). Some households also use surface water (river/dam/lake/pond/ stream/canal/irrigation channel (20.0%)). It is unprotected well (34.0%) in Bolo followed by public tap / standpipe (30.0%). Some households also use surface water (river/dam/lake/pond/ stream/canal/irrigation channel (20.0%)). It is protected well in Ude Dhankaka (60.0%) followed by piped to neighbor (24.0%). In Areda, it is piped to neighbor (42.0%) followed by piped into dwelling (24.0%). In Biyo, it is piped to neighbor (38.0%) followed by unprotected well (32.0%) while it is mainly surface water (river/dam/lake/pond/ stream/canal/irrigation channel) in Kamise (98.0%).

Table 10: Main water source for other purposes such as cooking and hand washing during dry season (%)

Water Source	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Piped Into Dwelling	2.0	2.0	34.0	0.0	24.0	0.0	0.0	8.9
Piped To Yard/Plot	2.0	4.0	10.0	0.0	8.0	2.0	0.0	3.7
Piped To Neighbor	0.0	8.0	18.0	24.0	42.0	38.0	0.0	18.6
Public Tap/Standpipe	2.0	30.0	16.0	2.0	8.0	0.0	2.0	8.6
Tube Well Or Borehole	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.3
Protected Well	2.0	0.0	0.0	60.0	12.0	14.0	0.0	12.6
Unprotected Well	0.0	34.0	0.0	14.0	0.0	32.0	0.0	11.4
Protected Spring	34.0	0.0	2.0	0.0	0.0	8.0	0.0	6.3
Unprotected Spring	50.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1
Rainwater	6.0	0.0	0.0	0.0	0.0	2.0	0.0	1.1
Tanker Truck (Boti)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cart with Small Tank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Water (River/Dam/Lake/ Pond/ Stream/Canal/ Irrigation Channel	2.0	20.0	20.0	0.0	6.0	2.0	98.0	21.1
Bottled Water	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.3
Other (Specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

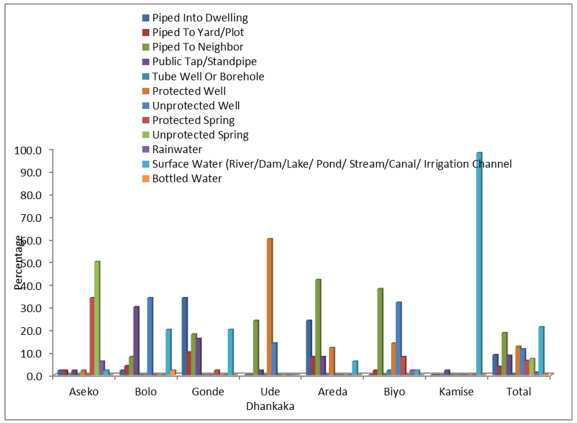


Figure 24: Main water source for other purposes such as cooking and hand washing during dry season

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.3 Main Water Source for Drinking During Rainy Season

The finding in this regard (table 13 and figure 26) reveals that the main water source for drinking in Aseko during rainy season is unprotected spring (44.0%) followed by protected spring (32.0%). It is public tap/standpipe (76.0%) in Bolo and a mix of different sources in Gonde (piped into dwelling (36.0%), piped to neighbor (28.0%) and public tap/standpipe (20.0%)). It protected well in Ude Dhankaka (58.0%) followed by piped to neighbor (26.0%). In Areda, it is piped to neighbor (42.0%) followed by piped into dwelling (24.0%). In Biyo, it is piped to neighbor (44.0%) followed by unprotected well (26.0%) while it is surface water (river/dam/lake/pond/ stream/canal/irrigation channel) in Kamise (54.0%) followed by rainwater (20.0%).

Table 11: Main water source for drinking during rainy season (%)

Water Source	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Piped Into Dwelling	2.0	2.0	36.0	0.0	24.0	0.0	0.0	9.1
Piped To Yard/Plot	4.0	6.0	12.0	0.0	10.0	2.0	0.0	4.9
Piped To Neighbor	0.0	8.0	28.0	26.0	42.0	44.0	0.0	21.1
Public Tap/Standpipe	12.0	76.0	20.0	2.0	10.0	0.0	14.0	19.1
Tube Well Or Borehole	2.0	4.0	0.0	0.0	0.0	2.0	0.0	1.1
Protected Well	2.0	0.0	0.0	58.0	12.0	14.0	0.0	12.3
Unprotected Well	0.0	0.0	0.0	12.0	0.0	26.0	0.0	5.4
Protected Spring	32.0	0.0	2.0	0.0	0.0	8.0	2.0	6.3
Unprotected Spring	44.0	0.0	0.0	0.0	2.0	0.0	10.0	8.0
Rainwater	2.0	2.0	2.0	2.0	0.0	4.0	20.0	4.6
Tanker Truck (Boti)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cart with Small Tank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Water (River/Dam/Lake/ Pond/ Stream/Canal/ Irrigation Channel	0.0	2.0	0.0	0.0	0.0	0.0	54.0	8.0
Bottled Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (Specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.00	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

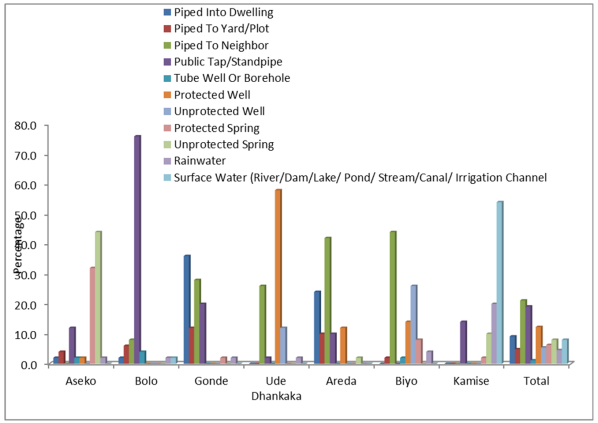


Figure 25: Main water source for drinking during rainy season

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.4 Main Water Source for other Purposes Such as Cooking and Hand Washing During Rainy Season

In this regard, the finding (table 14 and figure 27) reveals that the main water source for other purposes such as cooking and hand washing during rainy season in Aseko is rainwater (66.0%). Some households also use protected spring (10.0%) and unprotected spring (10.0%). It is rainwater (34.0%) in Bolo followed by unprotected well (32.0%) and public tap / standpipe (20.0%). It is piped into dwelling (36.0%) in Gonde followed by rainwater (26.0%). It is rainwater in Ude Dhankaka (62.0%) followed by protected well (34.0%). In Areda, it is rainwater (64.0%) followed by piped to neighbor (10.0%). In Biyo, it is rainwater (64.0%) followed by piped to neighbor (12.0%) while it is rainwater (60.0%) followed by surface water (river/dam/lake/pond/ stream/canal/irrigation channel (40.0%)) in Kamise.

Table 12: Main water source for other purposes such as cooking and hand washing during rainy season (%)

Water Source	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Piped Into Dwelling	2.0	2.0	36.0	0.0	8.0	0.0	0.0	6.9
Piped To Yard/Plot	2.0	2.0	8.0	0.0	6.0	0.0	0.0	2.6
Piped To Neighbor	0.0	0.0	10.0	2.0	10.0	12.0	0.0	4.9
Public Tap/Standpipe	4.0	20.0	14.0	0.0	6.0	0.0	0.0	6.3
Tube Well Or Borehole	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.6
Protected Well	2.0	0.0	0.0	34.0	4.0	10.0	0.0	7.1
Unprotected Well	0.0	32.0	0.0	2.0	0.0	8.0	0.0	6.0
Protected Spring	10.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Unprotected Spring	10.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Rainwater	66.0	34.0	26.0	62.0	64.0	64.0	60.0	53.7
Tanker Truck (Boti)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cart with Small Tank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Water (River/Dam/Lake/Pond/ Stream/ Canal/Irrigation Channel	4.0	8.0	6.0	0.0	2.0	4.0	40.0	9.1
Bottled Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (Specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

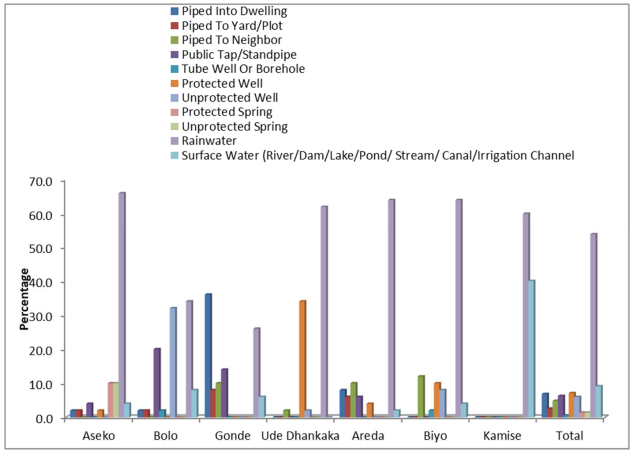
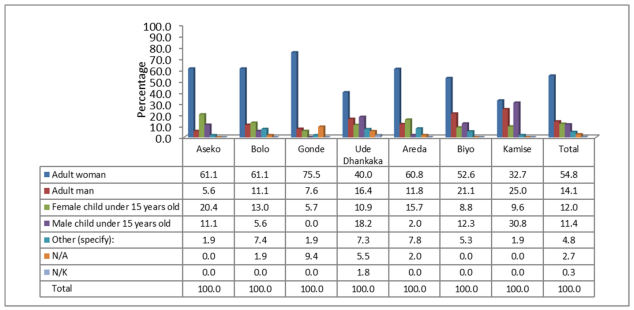


Figure 26: Main water source for other purposes such as cooking and hand washing during rainy season

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.5 Family Members Fetched Water a Day before the Interview Date

Respondents were also asked who fetched water in the family the day before the interview date. The consultant asked the question on a limited date like the day before the interview date so that respondents might be able to eliminate their perception to this question. The finding (figure 28) reveals that it is mainly the responsibility of adult woman (61.1% in Aseko, 61.1% in Bolo, 75.5% in Gonde, 40.0% in Ude Dhankaka, 60.8% in Areda, 52.6% in Biyo and 32.7% in Kamise). Female child under 15 years old are also mentioned as the next responsible family members in Aseko (20.4%), Bolo (13.0%) and Areda (15.7%). Male children under 15 years old are also mentioned at the second level in Kamise (30.8%) and Ude Dhankaka (18.2%).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Adult woman	61.1	61.1	75.5	40.0	60.8	52.6	32.7	54.8
Adult man	5.6	11.1	7.6	16.4	11.8	21.1	25.0	14.1
Female child under 15 years old	20.4	13.0	5.7	10.9	15.7	8.8	9.6	12.0
Male child under 15 years old	11.1	5.6	0.0	18.2	2.0	12.3	30.8	11.4
Other (specify):	1.9	7.4	1.9	7.3	7.8	5.3	1.9	4.8
N/A	0.0	1.9	9.4	5.5	2.0	0.0	0.0	2.7
N/K	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

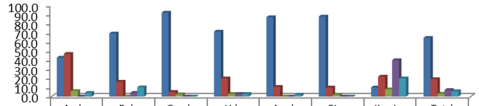
Other includes female over 15 /8/, water from neighbor /1/, male over 15 /4/, no water yesterday /2/, private water supplier /2/ and provided by son/daughter /1/.

Figure 27: Family members fetched water a day before the interview date

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.6 Distance to Main Water Source (One Way) in Dry Season (Exclusive of Waiting Time)

The finding (figure 29) reveals that the larger proportions of the households travel for up to half an hour to the main water source in dry season in the five towns except those in Aseko town where it requires traveling up to an hour (46.9%) and in Kamise town where it requires traveling up to two hours (40.0%). The median is from as short as 5 minutes in Gonde to as long as 120 minutes in Kamise (table 15).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 30 Minutes	42.9	69.4	92.3	71.4	87.2	88.0	10.0	64.6
31 - 60 Minutes	46.9	16.3	5.1	20.0	10.6	10.0	22.0	19.1
61 - 90 Minutes	6.1	0.0	2.6	2.9	0.0	2.0	8.0	3.1
91 - 120 Minutes	0.0	4.1	0.0	2.9	0.0	0.0	40.0	7.2
More than 120 Minutes	4.1	10.2	0.0	2.9	2.1	0.0	20.0	6.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 28: Distance to main water source (one way) in dry season (exclusive of waiting time)

Source: Household Survey Data, December/2019 –January/2020

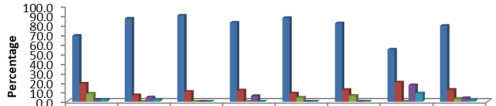
Table 13: Statistics on time taken to main water source in dry season (minute)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	3	51.0	50	360	357	49
Bolo	1	53.6	15	420	419	49
Gonde	2	14.4	5	90	88	39
Ude Dhankaka	1	30.4	10	240	239	35
Areda	2	18.5	10	180	178	47
Biyo	1	19.7	18	90	89	50
Kamise	2	110.3	120	240	238	50
Total	1	44.3	20	420	419	319

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.7 Distance to Main Water Source (One Way) in Rainy Season (Exclusive of Waiting Time)

The finding (figure 30) reveals that the larger proportions of the households travel for up to half an hour to the main water source in rainy season except Kamise where the proportion is relatively low (54.3%). Furthermore, 20.0% from Kamise indicated that they travel up to an hour while some 17.1% even travel up to two hours. The median is 10 to 30 minutes while there are those who travel for 6 hours like in Aseko (table 16).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 30 Minutes	68.8	86.7	89.7	82.4	87.2	81.6	54.3	79.1
31 - 60 Minutes	18.8	6.7	10.3	11.8	8.5	12.2	20.0	12.5
61 - 90 Minutes	8.3	0.0	0.0	0.0	4.3	6.1	0.0	3.0
91 - 120 Minutes	2.1	4.4	0.0	5.9	0.0	0.0	17.1	3.7
More than 120 Minutes	2.1	2.2	0.0	0.0	0.0	0.0	8.6	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 29: Distance to main water source (one way) in rainy season (exclusive of waiting time)

Source: Household Survey Data, December/2019 –January/2020

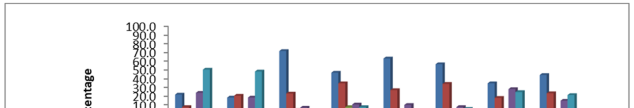
Table 14: Statistics on time taken to main water source in rainy season (minute)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	1	36.8	30	360	359	48
Bolo	1	25.3	10	240	239	45
Gonde	1	13.0	10	45	44	39
Ude Dhankaka	1	23.6	13	120	119	34
Areda	1	17.2	10	80	79	47
Biyo	1	23.7	20	90	89	49
Kamise	3	59.1	30	180	177	35
Total	1	27.8	15	360	359	297

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.8 Waiting Time for Fetching Water in Dry Season Last Time

In addition to traveling for longer minutes to the main water source in dry season, the finding (figure 31) also reveals that it requires longer time of waiting at the water source up to a maximum of two hours like in Aseko (49.0%) and Bolo (46.8%). There are also households that spend up to half an hour like in Gonde (70.0%), Ude Dhankaka (45.5%), Areda (61.7%) and Biyo (55.1%). In Kamise town, some households spend up to half an hour (33.33%) while some others spend up to two hours (26.7%). There are also households who spend 10 hours like in Aseko and 7 hours like in Bolo (table 17).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 30 Minutes	20.4	17.0	70.3	45.5	61.7	55.1	33.3	42.8
31 - 60 Minutes	6.1	19.2	21.6	33.3	25.5	32.7	16.7	21.9
61 - 90 Minutes	2.0	0.0	2.7	6.1	2.1	2.0	0.0	2.1
91 - 120 Minutes	22.5	17.0	5.4	9.1	8.5	6.1	26.7	13.4
More than 120 Minutes	49.0	46.8	0.0	6.1	2.1	4.1	23.3	19.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 30: Distance to main water source (one way) in rainy season (exclusive of waiting time)

Source: Household Survey Data, December/2019 –January/2020

Table 15: Statistics on waiting time at main water source in dry season (minute)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	2	162.9	120	600	598	49
Bolo	1	159.1	120	420	419	47
Gonde	2	29.0	10	120	118	37
Ude Dhankaka	2	52.3	40	180	178	33
Areda	1	39.5	30	180	179	47
Biyo	1	44.4	30	180	179	49
Kamise	5	97.8	90	240	235	30
Total	1	86.4	60	600	599	292

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.9 Waiting Time for Fetching Water in Rainy Season Last Time

In addition to traveling for longer minutes to the main water source in rainy season, the finding (figure 32) also reveals that it requires longer time of waiting at the water source up to half an hour in all the seven towns even up to six hours like in Aseko (table 18).

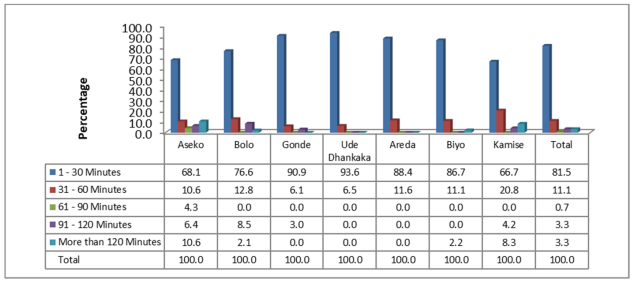


Figure 31: Waiting time for fetching water in rainy season last time

Source: Household Survey Data, December/2019 –January/2020

Table 16: Statistics on waiting time at main water source in rainy season (minute)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	1	61.0	20	360	359	47
Bolo	1	33.1	20	180	179	47
Gonde	1	16.2	5	120	119	33
Ude Dhankaka	2	20.8	20	60	58	31
Areda	1	14.8	10	60	59	43
Biyo	1	21.2	15	150	149	45
Kamise	2	45.0	30	180	178	24
Total	1	30.6	15	360	359	270

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.10 Amount Paid for Water per 20 Liter Jerry Can

Regarding price of water for 20 liter jerry can, as captured by figure 33, majority of the households in Aseko (89.6%) and Bolo (46.9%) indicated they pay up to fifty cents while those in Gonde (48.2%), in Ude Dhankaka (64.0%), in Areda (75.6%) and in Biyo (89.3%) pay fifty cents up to one Birr (inclusive) for one 20 liter jerry can. Those in Aseko (42.9%) pay more than one birr for same amount of water. Households on average pay 1 Birr except Aseko (25 cents) and Bolo (60 cents) (table 19).

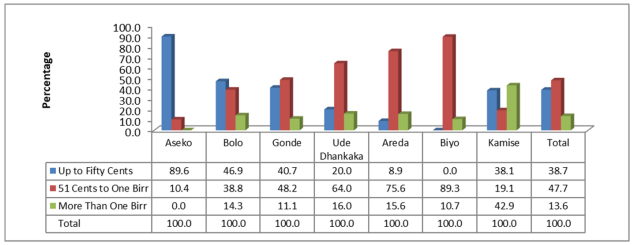


Figure 32: Amount paid for water per 20 liter jerry can

Source: Household Survey Data, December/2019 –January/2020

Table 17: Statistics on price of water per 20 liter jerry can (Birr)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	0.25	0.33	0.25	1.00	0.75	48
Bolo	0.15	0.79	0.60	2.00	1.85	49
Gonde	0.25	0.83	1.00	2.00	1.75	27

Ude Dhankaka	0.50	1.06	1.00	2.00	1.50	25
Areda	0.50	1.11	1.00	2.00	1.50	45
Biyo	1.00	1.16	1.00	3.00	2.00	28
Kamise	0.20	1.64	1.00	3.50	3.30	21
Total	0.15	0.91	1.00	3.50	3.35	243

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.11 Weekly Quantity of Fetched Water in Dry Season

Regarding the number of 20 liter jerry cans fetched at household level in a week in dry season, the number varies among the towns (figure 34). For example, half of the respondents in Gonde (50.0%), 46.9% in Kamise and 29.2% in Aseko indicated in a range of 1 to 10 jerry cans in a week. Some households in Aseko (22.9%), 32.7% in Bolo, 21.7% in Ude Dhankaka and 36.0% in Areda indicated in a range of 20 to 30 jerry cans in a week. Some households in Biyo (30.6%) indicated more than 40 jerry cans in a week. The averages (both mean and median) vary between the towns (table 20).

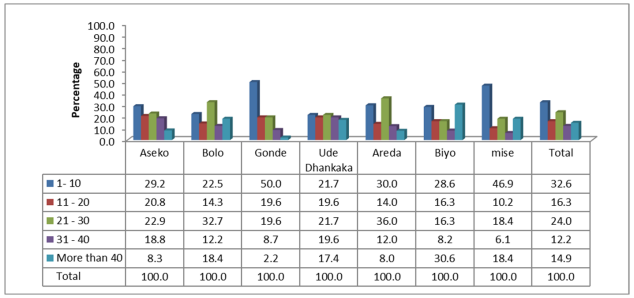


Figure 33: Weekly quantity of fetched water in dry season

Source: Household Survey Data, December/2019 –January/2020

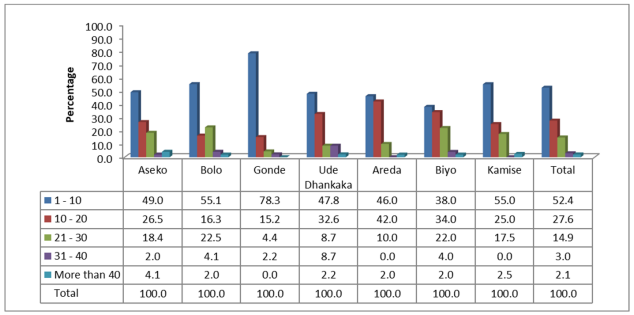
Table 18: Statistics on weekly water fetched in 20 liter jerry can in dry season (number of 20 liter jerry cans)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	2	22.8	21	70	68	48
Bolo	1	26.0	21	70	69	49
Gonde	1	15.3	11	70	69	46
Ude Dhankaka	2	28.2	27	140	138	46
Areda	4	22.5	25	70	66	50
Biyo	2	29.2	28	98	96	49
Kamise	4	21.8	14	56	52	49
Total	1	23.7	21	140	139	337

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.12 Weekly Quantity of Fetched Water in Rainy Season

Regarding the number of 20 liter jerry cans fetched at household level in a week in rainy season, the majority (from 38.0% in Biyo to 78.3% in Gonde) indicated in a range of 1 to 10 jerry cans in a week (figure 35) with average of 8 jerry cans in Gonde to 15 jerry cans in Biyo (table 21)..



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 10	49.0	55.1	78.3	47.8	46.0	38.0	55.0	52.4
10 - 20	26.5	16.3	15.2	32.6	42.0	34.0	25.0	27.6
21 - 30	18.4	22.5	4.4	8.7	10.0	22.0	17.5	14.9
31 - 40	2.0	4.1	2.2	8.7	0.0	4.0	0.0	3.0
More than 40	4.1	2.0	0.0	2.2	2.0	2.0	2.5	2.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 34: Weekly quantity of fetched water in rainy season

Source: Household Survey Data, December/2019 –January/2020

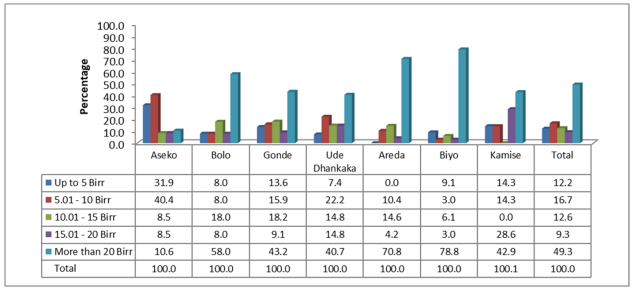
Table 19: Statistics on weekly water fetching in 20 liter jerry can in rainy season (number of 20 liter jerry cans)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	1	13.7	12	70	69	49
Bolo	1	13.7	10	48	47	49
Gonde	1	8.0	7	35	34	46
Ude Dhankaka	2	14.1	14	42	40	46
Areda	2	12.2	14	42	40	50
Biyo	1	14.8	14	42	41	50
Kamise	2	12.1	8	42	40	40
Total	1	12.7	10	70	69	330

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.13 Amount Paid for Water per Week in Dry Season

Regarding the amount paid for water in a week in dry season, as shown in figure 36, 40.4% in Aseko indicated five to ten Birr. In the other towns like Bolo (58.0%), Gonde (43.2%), Ude Dhankaka (40.7%), Areda (70.8%), Biyo (78.8%) and Kamise (42.9%) payment of more than twenty Birr is reported. Some households also pay as big as 140 Birr like in Ude Dhankaka (table 22).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Up to 5 Birr	31.9	8.0	13.6	7.4	0.0	9.1	14.3	12.2
5.01 - 10 Birr	40.4	8.0	15.9	22.2	10.4	3.0	14.3	16.7
10.01 - 15 Birr	8.5	18.0	18.2	14.8	14.6	6.1	0.0	12.6
15.01 - 20 Birr	8.5	8.0	9.1	14.8	4.2	3.0	28.6	9.3
More than 20 Birr	10.6	58.0	43.2	40.7	70.8	78.8	42.9	49.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.1	100.0

Figure 35: Amount paid for water per week in dry season

Source: Household Survey Data, December/2019 –January/2020

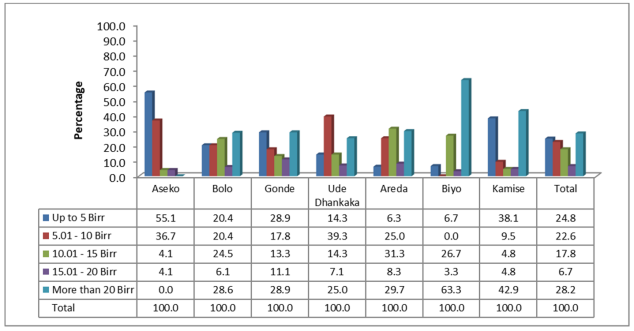
Table 20: Statistics on weekly payment for water in dry season (Birr)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	0.25	11.31	7.50	60.00	59.75	47
Bolo	1.50	30.47	22.75	100.00	98.50	50
Gonde	0.75	26.55	18.75	120.00	119.25	44
Ude Dhankaka	2.90	32.50	20.00	140.00	137.10	27
Areda	7.00	28.23	28.00	100.00	93.00	48
Biyo	1.00	43.86	42.00	84.00	83.00	33
Kamise	1.00	22.68	17.00	48.00	47.00	21
Total	0.25	27.33	20.00	140.00	139.75	270

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.14 Amount Paid for Water per Week in Rainy Season

Regarding the amount paid for water in a week in rainy season, as shown in figure 37, as majority of answer, 55.1% in Aseko, 28.9% in Gonde and 38.1% in Kamise indicated up to five Birr. In Ude Dhankaka, 39.3% indicated payment of five to ten Birr while those in Bolo (28.6%), Gonde (28.9%), Biyo (63.3%) and Kamise (42.9%) paid more than twenty Birr. In Areda, 31.3% indicated payment of ten to fifteen Birr in a week while there are also households who paid 70 Birr and more (table 23).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Up to 5 Birr	55.1	20.4	28.9	14.3	6.3	6.7	38.1	24.8
5.01 - 10 Birr	36.7	20.4	17.8	39.3	25.0	0.0	9.5	22.6
10.01 - 15 Birr	4.1	24.5	13.3	14.3	31.3	26.7	4.8	17.8
15.01 - 20 Birr	4.1	6.1	11.1	7.1	8.3	3.3	4.8	6.7
More than 20 Birr	0.0	28.6	28.9	25.0	29.7	63.3	42.9	28.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 36: Amount paid for water per week in rainy season

Source: Household Survey Data, December/2019 –January/2020

Table 21: Statistics on weekly payment for water in rainy season (Birr)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	0.25	5.53	5.00	20.00	19.75	49
Bolo	0.60	17.26	12.60	70.00	69.40	49
Gonde	0.50	18.71	12.50	75.00	74.50	45
Ude Dhankaka	2.00	15.13	10.00	42.00	40.00	28
Areda	5.00	17.50	14.00	70.00	65.00	48
Biyo	3.00	27.48	28.00	73.50	70.50	30
Kamise	1.00	18.38	12.00	37.50	36.50	21
Total	0.25	16.42	12.55	75.00	74.75	270

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.14 Reason(s) for Not Paying for Water or Not Applicable

Among the reasons for not paying for water, out of those who indicated that they are not paying for water, all in Aseko (100.0%) and Ude Dhankaka (100.0%), and some in Gonde (50.0%) and Biyo (50.0%) indicated use of private water source or private connections while those in Kamise (70.0%) mentioned use of unprotected water source (table 24).

Table 22: Reason(s) for not paying or not applicable (%)

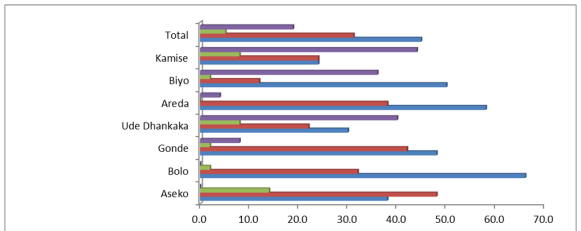
Reason	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
I use unprotected water source (from natural sources such as	0.0	0.0	25.0	0.0	0.0	0.0	70.0	38.1
I use private water source/private connections	100.0	0.0	50.0	100.0	0.0	50.0	0.0	38.1
Other	0.0	0.0	25.0	0.0	0.0	50.0	30.0	23.8
Total	100.0	0.0	100.0	100.0	0.0	100.0	100.0	100.0

Others include river /4/ and support from neighbor /1/

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.15 Opinion on the Amount Paid for Water

Figure 38 presents opinion regarding current payment amount for water. Accordingly, 68.0% in Bolo, 58.0% in Areda, 50.0% in Biyo, 48.0% in Gonde, 38.0% in Aseko and 30.0% in Ude Dhankaka consider it as high cost while 48.0% in Aseko, 42.0% in Gonde, 38.0% in Areda and 32.0% in Bolo consider it as reasonable.



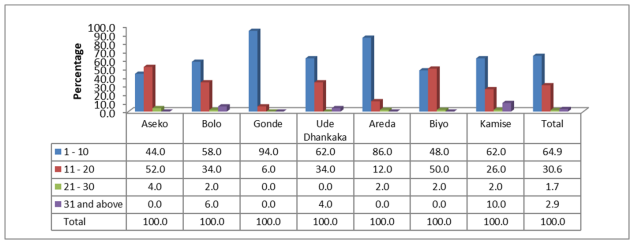
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
I don't pay for water	0.0	0.0	8.0	40.0	4.0	36.0	44.0	18.9
Low cost	14.0	2.0	2.0	8.0	0.0	2.0	8.0	5.1
Reasonable	48.0	32.0	42.0	22.0	38.0	12.0	24.0	31.1
High cost (economic burden for family)	38.0	66.0	48.0	30.0	58.0	50.0	24.0	44.9

Figure 37: Opinion on the amount paid for water

Source: Household Survey Data, December/2019 –January/2020

3.1.3.1.16 Water Consumption per Day for Different Purposes

Households were also requested to specify daily water consumption for drinking, cooking, bathing, washing clothes and livestock. Regarding daily water consumption for drinking, the finding (table 25) shows that the median is 20 liters a day in Aseko, 10 liters a day in Bolo, 5 liters a day in Gonde, 10 liters a day in Ude Dhankaka, 5 liters a day in Areda, 13.5 liters a day in Biyo, and 10 liters a day in Kamise. The majority consume 1 – 10 liters a day for drinking in Bolo, Gonde, Ude Dhankaka, Areda and Kamise, and 11 – 20 liters a day in Aseko and Biyo (figure 39).

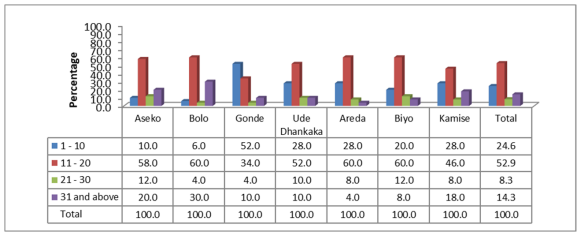


	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 10	44.0	58.0	94.0	62.0	86.0	48.0	62.0	64.9
11 - 20	52.0	34.0	6.0	34.0	12.0	50.0	26.0	30.6
21 - 30	4.0	2.0	0.0	0.0	2.0	2.0	2.0	1.7
31 and above	0.0	6.0	0.0	4.0	0.0	0.0	10.0	2.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 38: Water consumption per day for drinking

Source: Household Survey Data, December/2019 –January/2020

Regarding daily water consumption for cooking, the finding (table 25) shows that the median is 20 liters a day in Aseko, Bolo, Ude Dhankaka, Areda, Biyo and Kamise while it is 10 liters a day in Gonde. The majority consume 11 – 20 liters a day for cooking in all towns except Gonde in which it is 1 – 10 liters a day (figure 40).

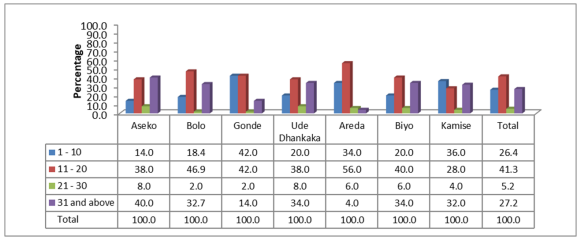


	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 10	10.0	6.0	52.0	28.0	28.0	20.0	28.0	24.6
11 - 20	58.0	60.0	34.0	52.0	60.0	60.0	46.0	52.9
21 - 30	12.0	4.0	4.0	10.0	8.0	12.0	8.0	8.3
31 and above	20.0	30.0	10.0	10.0	4.0	8.0	18.0	14.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 39: Water consumption per day for cooking

Source: Household Survey Data, December/2019 –January/2020

Regarding daily water consumption for bathing, the finding (table 25) shows that the median is 20 liters a day in all towns except Gonde where it is 17.5 liters. The majority consume 11 – 20 liters a day for bathing in Bolo, Gonde, Ude Dhankaka, Areda and Biyo, above 30 liters a day in Aseko and 1 – 10 liters a day in Kamise (figure 41).



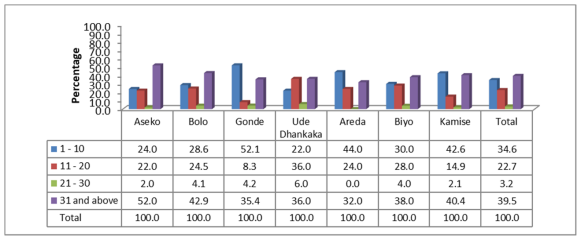
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 10	14.0	18.4	42.0	20.0	34.0	20.0	36.0	26.4
11 - 20	38.0	46.9	42.0	38.0	56.0	40.0	28.0	41.3
21 - 30	8.0	2.0	2.0	8.0	6.0	6.0	4.0	5.2
31 and above	40.0	32.7	14.0	34.0	4.0	34.0	32.0	27.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 40: Water consumption per day for bathing

Source: Household Survey Data, December/2019 –January/2020

Regarding daily water consumption for washing clothes, the finding (table 25) shows that the median is 40 liters a day in Aseko, 20

liters a day in Bolo, Ude Dhankaka, Biyo and Kamise, 10 liters a day in Gonde and .15 liters a day in Areda. The majority consume above 30 liters a day for washing clothes in Aseko, Bolo, Ude Dhankaka and Biyo, 1 – 10 liters a day in Gonde, Areda and Kamise (figure 42).

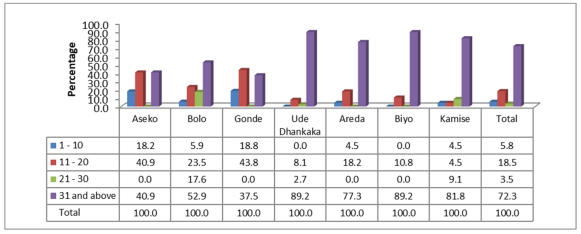


	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 10	24.0	28.6	52.1	22.0	44.0	30.0	42.6	34.6
11 - 20	22.0	24.5	8.3	36.0	24.0	28.0	14.9	22.7
21 - 30	2.0	4.1	4.2	6.0	0.0	4.0	2.1	3.2
31 and above	52.0	42.9	35.4	36.0	32.0	38.0	40.4	39.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 41: Water consumption per day for washing clothes

Source: Household Survey Data, December/2019 –January/2020

Regarding daily water consumption for livestock, the finding (table 25) shows that the median is 20 liters a day in Aseko and Gonde, 40 liters a day in Bolo, 80 liters a day in Ude Dhankaka and Biyo, 60 liters Areda and 100 liters a day in Kamise. The majority consume above 30 liters a day for livestock in all towns except Gonde where it is 11 – 20 liters (figure 43).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1 - 10	18.2	5.9	18.8	0.0	4.5	0.0	4.5	5.8
11 - 20	40.9	23.5	43.8	8.1	18.2	10.8	4.5	18.5
21 - 30	0.0	17.6	0.0	2.7	0.0	0.0	9.1	3.5
31 and above	40.9	52.9	37.5	89.2	77.3	89.2	81.8	72.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 42: Water consumption per day for livestock

Source: Household Survey Data, December/2019 –January/2020

Table 23: Water consumption per day for different purposes (liter)

Town	Purposes	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	Drinking	2.00	14.60	20.00	30.00	28.00	50
	Cooking	2.00	25.30	20.00	100.00	98.00	50
	Bathing	1.00	40.02	20.00	300.00	299.00	50
	Washing clothes	3.00	57.22	40.00	300.00	297.00	50
	Livestock	2.00	39.32	20.00	200.00	198.00	22
Bolo	Drinking	1.00	16.58	10.00	220.00	219.00	50
	Cooking	5.00	26.10	20.00	60.00	55.00	50
	Bathing	1.00	26.67	20.00	100.00	99.00	49
	Washing clothes	2.00	52.61	20.00	240.00	238.00	49
	Livestock	1.00	45.35	40.00	160.00	159.00	17
Gonde	Drinking	1.00	6.08	5.00	20.00	19.00	50
	Cooking	3.00	16.16	10.00	60.00	57.00	50
	Bathing	3.00	17.44	17.50	60.00	57.00	50
	Washing clothes	4.00	31.90	10.00	180.00	176.00	48
	Livestock	2.00	26.06	20.00	60.00	58.00	16
Ude Dhankaka	Drinking	2.00	12.10	10.00	40.00	38.00	50
	Cooking	1.00	18.80	20.00	40.00	39.00	50
	Bathing	2.00	27.28	20.00	100.00	98.00	50
	Washing clothes	6.00	47.52	20.00	300.00	294.00	50

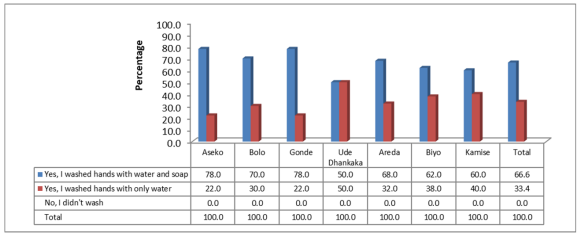
Town	Purposes	Minimum	Mean	Median	Maximum	Range	Valid N
	Livestock	11.00	118.68	80.00	620.00	609.00	37
Areda	Drinking	1.00	6.98	5.00	30.00	29.00	50
	Cooking	1.00	18.38	20.00	60.00	59.00	50
	Bathing	2.00	16.86	20.00	80.00	78.00	50
	Washing clothes	3.00	32.84	15.00	160.00	157.00	50
	Livestock	10.00	64.09	60.00	140.00	130.00	22
Biyo	Drinking	2.00	12.62	13.50	25.00	23.00	50
	Cooking	10.00	20.50	20.00	50.00	40.00	50
	Bathing	3.00	31.10	20.00	120.00	117.00	50
	Washing clothes	5.00	52.28	20.00	200.00	195.00	50
	Livestock	20.00	98.78	80.00	500.00	480.00	37
Kamise	Drinking	2.00	13.46	10.00	40.00	38.00	50
	Cooking	2.00	21.70	20.00	80.00	78.00	50
	Bathing	2.00	26.38	20.00	100.00	98.00	50
	Washing clothes	4.00	32.74	20.00	100.00	96.00	47
	Livestock	10.00	148.73	100.00	800.00	790.00	22

Source: Household Survey Data, December/2019 –January/2020

3.1.3.2 Sanitation and Hygiene

3.1.3.2.1 Hand Washing Practices

Regarding hand washing practices before suppler last night before the interview date, the finding (figure 44) reveals that the majority of the respondents indicated that they wash their hands with water and soap (from 50.0% in Ude Dhankaka to 78.0% in Aseko. Some 50.0% in Ude Dhankaka and 40.0% in Kamise indicated that they wash hands with water only.



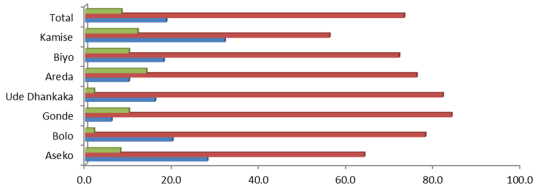
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Yes, I washed hands with water and soap	78.0	70.0	78.0	50.0	68.0	62.0	60.0	66.6
Yes, I washed hands with only water	22.0	30.0	22.0	50.0	32.0	38.0	40.0	33.4
No, I didn't wash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 43: Hand washing practices

Source: Household Survey Data, December/2019 –January/2020

3.1.3.2.2 Whether Male Family Members Experienced Water Borne Diseases

As captured by figure 45, even though majority of the respondents indicated that male family members didn't experience water borne diseases, 32.0% in Kamise, 28.0% in Aseko, 20.0% in Bolo, 18.0% in Biyo and 16.0% in Ude Dhankaka were infected by water borne diseases.



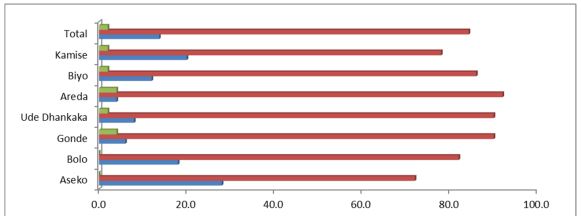
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
N/A	8.0	2.0	10.0	2.0	14.0	10.0	12.0	8.3
No	64.0	78.0	84.0	82.0	76.0	72.0	56.0	73.1
Yes	28.0	20.0	6.0	16.0	10.0	18.0	32.0	18.6

Figure 44: Whether male family members experienced water borne diseases

Source: Household Survey Data, December/2019 –January/2020

3.1.3.2.3 Whether Female Family Members Experienced Water Borne Diseases

As captured by figure 46, similar to the male counterparts, even though majority of the respondents (overall 84.3%) indicated that female family members didn't experience water borne diseases, 28.0% in Aseko, 20.0% in Kamise and 18.0% in Bolo indicated that female family members were infected by water borne diseases. The group of women infected by water borne diseases includes parturient women (66.7% in Gonde, 55.6% in Bolo and 50.0% in Kamise) and pregnant women (33.3% both in Bolo and Gonde) (table 26).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
N/A	0.0	0.0	4.0	2.0	4.0	2.0	2.0	2.0
No	72.0	82.0	90.0	90.0	92.0	86.0	78.0	84.3
Yes	28.0	18.0	6.0	8.0	4.0	12.0	20.0	13.7

Figure 45: Whether female family members experienced water borne diseases

Source: Household Survey Data, December/2019 –January/2020

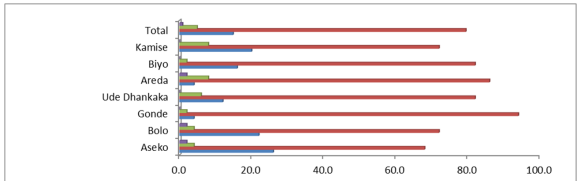
Table 24: Who (among female) experienced water born disease (%)

Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Pregnant woman	14.3	33.3	33.3	0.0	0.0	16.7	0.0	14.6
Parturient woman (female within two years of childbirth)	7.1	55.6	66.7	0.0	0.0	16.7	50.0	29.2
Other than above (1 or 2)	78.6	11.1	0.0	100.0	100.0	66.7	50.0	56.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

3.1.3.2.4 Whether Child Family Members Experienced Water Borne Diseases

Similar to adult males and females, even though majority of the respondents indicated that child family members didn't experience water borne diseases, 26.0% in Aseko, 22.0% in Bolo and 20.0% in Kamise indicated that child family members were infected by water borne diseases (figure 47). The group of children infected by water borne diseases includes infant younger than 1 year (all (100.0%) in Gonde, 27.3% in Bolo and 23.1% in Aseko) and child from 1 year - 9 years old (all (100.0%) in Areda and Biyo, 83.3% in Ude Dhankaka, 63.6% in Bolo and 61.5% in Aseko) (table 27).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
N/K	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.9
Family does have no child	4.0	4.0	2.0	6.0	8.0	2.0	8.0	4.9
No (Family has some children)	68.0	72.0	94.0	82.0	86.0	82.0	72.0	79.4
Yes	26.0	22.0	4.0	12.0	4.0	16.0	20.0	14.9

Figure 46: Whether child family members experienced water borne diseases

Source: Household Survey Data, December/2019 –January/2020

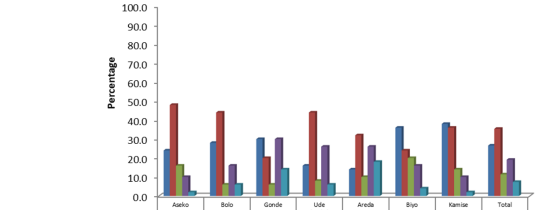
Table 25: Who (among children) experienced water borne diseases (%)

Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Infant younger than 1 year	23.1	27.3	100.0	16.7	0.0	0.0	10.0	19.2
Child from 1 year - 9 years old	61.5	63.6	0.0	83.3	100.0	100.0	60.0	69.2
Other than above (1 or 2)	15.4	9.1	0.0	0.0	0.0	0.0	30.0	11.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

3.1.3.2.5 Seasons of Water Borne Diseases Last Year

Regarding seasons of water borne diseases during last year, the finding (figure 48) reveals that major answer is rainy season in Aseko (48.0%), Bolo (44.0%), Ude Dhankaka (44.0%), Kamise (36.0%) and Areda (32.0%). Dry season is also reported as relatively high in answer by 38.0% in Kamise, 36.0% in Biyo, 30.0% in Gonde, 28.0% in Bolo and 24.00% in Aseko (36.0%).



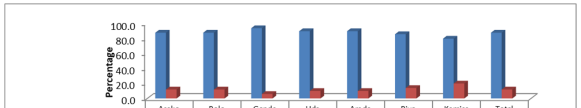
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Dry season	24.0	28.0	30.0	16.0	14.0	36.0	38.0	26.6
Rainy season	48.0	44.0	20.0	44.0	32.0	24.0	36.0	35.4
No difference between dry season and rainy season	16.0	6.0	6.0	8.0	10.0	20.0	14.0	11.4
N/A (They never experienced)	10.0	16.0	30.0	26.0	26.0	16.0	10.0	19.1
N/K	2.0	6.0	14.0	6.0	18.0	4.0	2.0	7.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 47: Season for water borne diseases last year

Source: Household Survey Data, December/2019 –January/2020

3.1.3.2.6 Drinking Water Treatment Practices

Regarding practices of treating water for drinking, the finding (figure 49) reveals that majority of the households do not treat water for drinking. There are few cases where the practice is confirmed (20.0% in Kamise, 14.0% in Biyo, 12.0% in Aseko and Bolo, 10.0% in Ude Dhankaka and Areda, and 6.0% in Gonde). Methods applied for water treatment include boiling and use of disinfectant like chlorine (table 28).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
No, we don't treat at all	88.0	88.0	94.0	90.0	90.0	86.0	80.0	88.0
Yes, we treat.	12.0	12.0	6.0	10.0	10.0	14.0	20.0	12.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 48: Drinking water treatment practices

Source: Household Survey Data, December/2019 –January/2020

Table 26: Drinking water treatment methods (%)

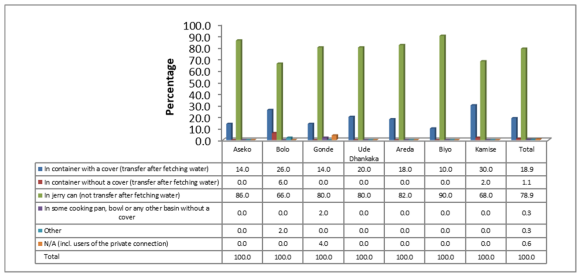
Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
By boiling	66.7	83.3	66.7	20.0	60.0	42.9	60.0	57.1
With disinfectant (e.g. chlorine)	16.7	16.7	33.3	80.0	40.0	57.1	30.0	38.1
Other	16.7	0.0	0.0	0.0	0.0	0.0	10.0	4.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Other methods include filtering using clean cloth /1/ and use of agar /1/.

Source: Household Survey Data, December/2019 –January/2020

3.1.3.2.7 Water Storage Practices

Regarding water storage practices at household level, as presented by figure 50, majority of the households store in jerry cans (from 66.0% in Bolo to 90.0% in Biyo). Use of container with a cover (30.0% in Aseko, 26.0% in Bolo and 20.0% in Ude Dhankaka) is also among the storages in use.



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
In container with a cover (transfer after fetching water)	14.0	26.0	14.0	20.0	18.0	10.0	30.0	18.9
In container without a cover (transfer after fetching water)	0.0	6.0	0.0	0.0	0.0	0.0	2.0	1.1
In jerry can (not transfer after fetching water)	86.0	66.0	80.0	80.0	82.0	90.0	68.0	78.9
In some cooking pan, bowl or any other basin without a cover	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.3
Other	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.3
N/A (incl. users of the private connection)	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

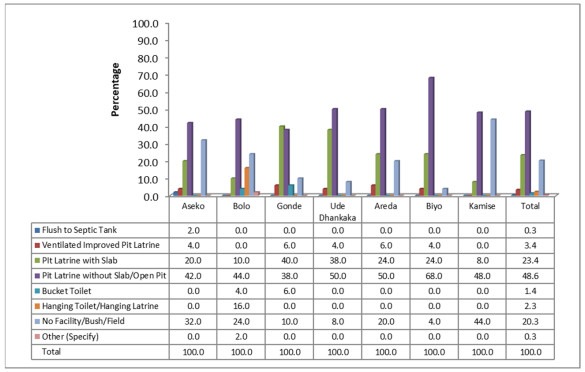
Other includes water jar /1/.

Figure 49: Water storage practices

Source: Household Survey Data, December/2019 –January/2020

3.1.3.2.8 Latrine Possession

Regarding type of latrines in use by households, figure 51 reveals that the type of latrine is mainly pit latrine without slab / open pit in most of the towns covered by the survey but pit latrine with slab in Gonde town. Bush/field is also mentioned by some households in Kamise, Aseko, Bolo and Areda.



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Flush to Septic Tank	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Ventilated Improved Pit Latrine	4.0	0.0	6.0	4.0	6.0	4.0	0.0	3.4
Pit Latrine with Slab	20.0	10.0	40.0	38.0	24.0	24.0	8.0	23.4
Pit Latrine without Slab/Open Pit	42.0	44.0	38.0	50.0	50.0	68.0	48.0	48.6
Bucket Toilet	0.0	4.0	6.0	0.0	0.0	0.0	0.0	1.4
Hanging Toilet/Hanging Latrine	0.0	16.0	0.0	0.0	0.0	0.0	0.0	2.3
No Facility/Bush/Field	32.0	24.0	10.0	8.0	20.0	4.0	44.0	20.3
Other (Specify)	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Other includes use of neighbor's toilet /1/.

Figure 50: Latrine possession

Source: Household Survey Data, December/2019 –January/2020

3.1.3.2.9 Hand Washing Facilities

Regarding hand washing facilities, the finding (table 29) shows that there are no hand washing facilities in majorities of the towns (from 60.0% in Ude Dhankaka to 86.0% in Areda). But, the majority of those with the facility have water indicated that in place (48.0% in Areda to 80.0% in Gonde) (figure 52).

Table 27: Hand washing facilities (%)

Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Facility which enable people to wash its both hands WITH a soap	6.0	6.0	8.0	14.0	6.0	10.0	6.0	8.0
Facility which enable people to wash its both hands WITHOUT soap	0.0	6.0	14.0	14.0	6.0	8.0	8.0	8.0
Bucket or basin WITH a soap	4.0	8.0	4.0	2.0	0.0	2.0	2.0	3.1
Bucket or basin WITHOUT a soap	12.0	12.0	2.0	10.0	2.0	4.0	0.0	6.0
No facility	78.0	68.0	72.0	60.0	86.0	76.0	84.0	74.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

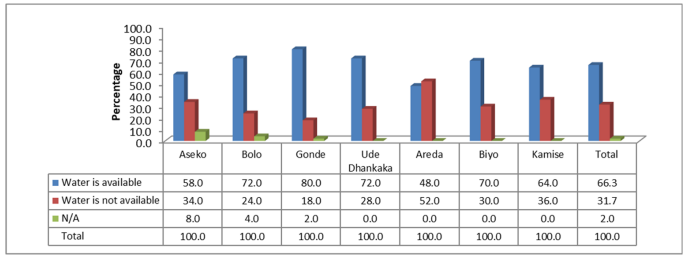


Figure 51: Whether water is available

Source: Household Survey Data, December/2019 –January/2020

3.1.4 Health and Nutrition

3.1.4.1 Whether Family Members Experienced Infectious Illness

Regarding whether family members experienced infectious illness, as captured by figure 53, the majority of the respondents indicated the family never experienced so far, 30.0% in Kamise and Ude Dhankaka, 18.0% in Biyo and Aseko, 10.0% in Areda and Bolo, and 6.0% in Gonde. The results confirmed that their family members had experienced some kinds of infectious diseases.

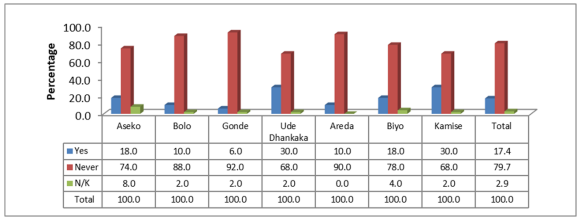


Figure 52: Hand washing facilities

Source: Household Survey Data, December/2019 –January/2020

As shown in table 30, family members affected by the infectious diseases include male adult members over 18 years old (in Aseko, Bolo, Ude Dhankaka, Areda, Biyo and Kamise), female adult members over 18 years old (in Aseko, Ude Dhankaka, Areda, Biyo and Kamise), children from 5 years old - 18 years old (in all the seven towns), and children from 1 year - 5 years old (excluding Areda). There are also cases of baby under 1 year in Aseko, Gonde and Kamise.

Table 28: Family members affected by the infectious disease (%)

Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Male adult members over 18 years old	41.7	40.0	0.0	45.5	50.0	33.3	43.5	40.9
Female adult members over 18 years old	8.3	0.0	0.0	31.8	25.0	26.7	17.4	20.5
Children from 5 years old - 18 years old	25.0	20.0	33.3	13.6	25.0	33.3	26.1	23.9
Children from 1 year - 5 years old	8.3	40.0	33.3	9.1	0.0	6.7	8.7	10.2
Baby under 1 year	16.7	0.0	33.3	0.0	0.0	0.0	4.4	4.6
Total	100.0	100.0	100.0	100.0	100.0	100.00	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

Table 31 presents that the infectious diseases include water related infectious diseases (in all the seven towns), trachoma (in Aseko) and other diseases like amoeba, bacteria, cough, pneumonia and typhoid (in Aseko, Bolo, Gonde and Ude Dhankaka).

Table 29: Type of the infectious diseases (%)

Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Water related infectious diseases	83.3	80.0	66.7	90.9	100.0	100.0	100.0	90.3
Trachoma	8.3	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Other (specify)	8.3	20.0	33.3	9.1	0.0	0.0	0.0	8.1
Other	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

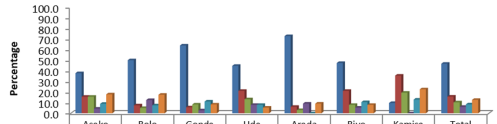
3.1.4.2 Medical Treatment Expenses

Respondents were also requested to comment on their annual expenses for medical treatment during last year. Due to big differences between the towns (table 32), median is used to reflect the situation where the median expense is Birr 2,000 in Aseko, Birr 1,500 in Bolo, Birr 850 in Gonde, Birr 1,700 in Ude Dhankaka, Birr 250 in Areda, Birr 1,500 in Biyo and Birr 2,500 in Kamise. Majority of the households paid a maximum of 1000 Birr except Kamise where the majority paid 1001 to 2000 Birr (figure 54).

Table 30: Medical treatment expenses (Birr)

Town	Minimum	Mean	Median	Maximum	Range	Valid N
Aseko	150.00	3,951.33	2,000.00	20,000.00	19,850.00	45
Bolo	70.00	3,765.50	1,500.00	50,,000.00	49,930.00	40
Gonde	70.00	2,253.75	850.00	20000.00	19,930.00	36
Ude Dhankaka	100.00	2,508.95	1,700.00	20,000.00	19,900.00	38
Areda	25.00	2,948.82	250.00	44,000.00	43,975.00	33
Biyo	10.00	2,306.18	1,500.00	15,000.00	14,990.00	38
Kamise	500.00	4,253.23	2,500.00	15,000.00	14,500.00	31

Source: Household Survey Data, December/2019 –January/2020



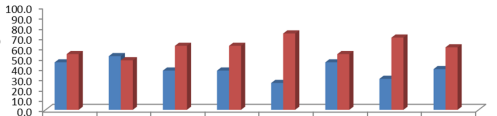
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
1000 and below	37.8	50.0	63.9	44.7	72.7	47.4	9.7	46.7
1001 - 2000	15.6	7.5	5.6	21.1	6.1	21.1	35.5	15.7
2001 - 3000	15.6	5.0	8.3	13.2	3.0	7.9	19.4	10.3
3001 - 4000	4.4	12.5	2.8	7.9	9.1	5.3	0.0	6.1
4001 - 5000	8.9	7.5	11.1	7.9	0.0	10.5	12.9	8.4
5001 and above	17.8	17.5	8.3	5.3	9.1	7.9	22.6	12.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 53: Medical treatment expenses

Source: Household Survey Data, December/2019 –January/2020

3.1.4.3 Whether the Family Has Children Under 5 Years Old

A question on whether the family has children under 5 years old is among the questions for households. In this regard, as shown in figure 55, 46.0% in Aseko and Biyo, 52.0% in Bolo, 38.0% in Gonde and Ude Dhankaka, 26.0% in Areda and 30.0% in Kamise confirmed the presence of at least one child in the family (table 33).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Yes	46.0	52.0	38.0	38.0	26.0	46.0	30.0	39.4
No	54.0	48.0	62.0	62.0	74.0	54.0	70.0	60.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 54: Whether the family has children under 5 years old

Source: Household Survey Data, December/2019 –January/2020

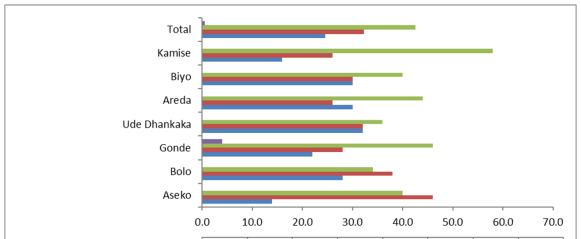
Table 31: Number of under 5 children (%)

Number of under 5 children	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
1	69.6	69.2	84.2	79.0	69.2	82.6	86.7	76.8
2	26.1	23.1	15.8	21.1	30.8	17.4	13.3	21.0
3	4.4	3.9	0.0	0.0	0.0	0.0	0.0	1.5
4	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.00

Source: Household Survey Data, December/2019 –January/2020

3.1.4.4 Whether the Family Received Awareness/Training on Baby Wash

Regarding whether the family received awareness / training on baby wash, the finding (figure 56) reveals that there are differences between the towns in this regard (from 14.0% in Aseko to 32.0% in Ude Dhankaka confirming that they had received the awareness / training).



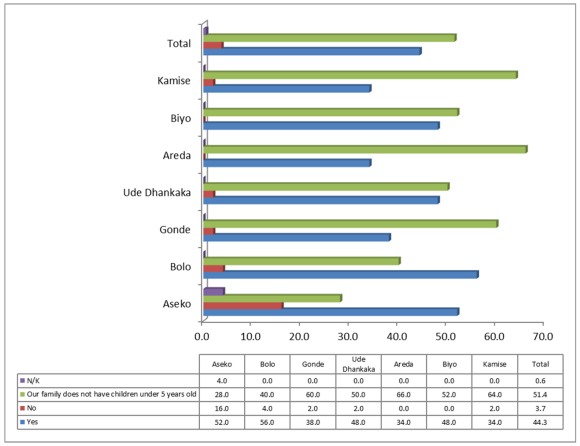
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
N/K	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.6
Our family does not have children under 5 years old	40.0	34.0	46.0	36.0	44.0	40.0	58.0	42.6
No	46.0	38.0	28.0	32.0	26.0	30.0	26.0	32.3
Yes	14.0	28.0	22.0	32.0	30.0	30.0	16.0	24.6

Figure 55: Whether the family received awareness/training on baby wash

Source: Household Survey Data, December/2019 –January/2020

3.1.4.5 Whether the Family Washed Hands and Faces of Children Under 5

As captured by figure 57, practices of washing hands and faces of children under 5 vary among the towns (from 34.0% in Kamise and Areda to 56.0% in Bolo). The main reason for not washing hands and faces of children under 5 is due to water stored at home was contaminated (100.0% in Gonde, Ude Dhankaka and Kamise; 50.0% in Bolo and 37.5% in Aseko) (table 34).



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
N/K	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Our family does not have children under 5 years old	28.0	40.0	60.0	50.0	66.0	52.0	64.0	51.4
No	16.0	4.0	2.0	2.0	0.0	0.0	2.0	3.7
Yes	52.0	56.0	38.0	48.0	34.0	48.0	34.0	44.3

Figure 56: Whether the family washed hands and faces of children under 5

Source: Household Survey Data, December/2019 –January/2020

Table 32: Reason if does not wash hands and faces of under 5 children (%)

Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Water stored at home was contaminated	37.5	50.0	100.0	100.0	0.0	0.0	100.0	53.9
Other	62.5	50.0	0.0	0.0	0.0	0.0	0.0	46.2

Total	100.0	100.0	100.0	100.0	0.0	0.0	100.0	100.0

Other includes No Child /4 responses/, No Child under 5 /2 responses/.

Source: Household Survey Data, December/2019 –January/2020

3.1.4.6 Whether Under 5 Children are stunted

In this regard, the proportions of households with stunted under 5 children is very minimal (as low as 0.0% in Kamise and Areda to 6.0% in Ude Dhankaka) (table 35).

Table 33: Whether under 5 children are stunted (%)

Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Yes	4.0	2.0	4.0	6.0	0.0	4.0	0.0	2.9
No, he/she/they are in good health	48.0	54.0	42.0	44.0	32.0	46.0	34.0	42.9
Our family does not have children under 5 years old	48.0	44.0	54.0	50.0	68.0	50.0	66.0	54.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

Further analysis was made to look at the proportion of households with stunted children of under 5 years old versus sex of household heads as captured by table 36.

Table 34: Whether some of under 5 year old children are stunted by sex of household head (%)

Sex of the household head	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Male	Yes	2.4	2.5	4.2	0.0	0.0	4.4	0.0	2.0
	No	46.3	52.5	50.0	52.4	42.9	46.7	32.3	46.6
	No children under 5 years old	51.2	45.0	45.8	47.6	57.1	48.9	67.7	51.4
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Female	Yes	11.1	0.0	3.8	37.5	0.0	0.0	0.0	5.1
	No	55.6	60.0	34.6	0.0	18.2	40.0	36.8	33.3
	No children under 5 years old	33.3	40.0	61.5	62.5	81.8	60.0	63.2	61.6
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

In Aseko, majority of the households with stunted under 5 children are female headed households (figure 58).

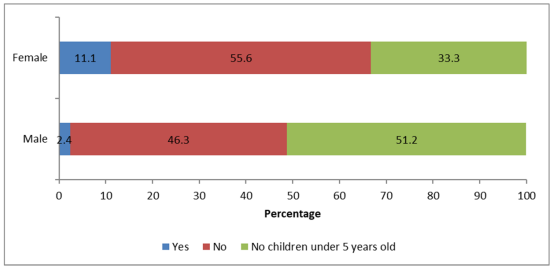


Figure 57: Whether some of under 5 year old children are stunted by sex of household head in Aseko

Source: Household Survey Data, December/2019 –January/2020

In Bolo, all of the households with stunted under 5 children are male headed households (figure 59).

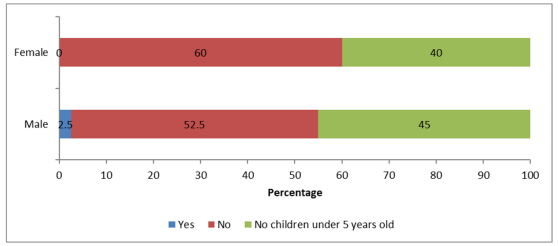


Figure 58: Whether some of under 5 year old children are stunted by sex of household head in Bolo

Source: Household Survey Data, December/2019 –January/2020

In Gonde, nearly equal proportions of households with stunted under 5 children are both female and male headed households (figure 60).

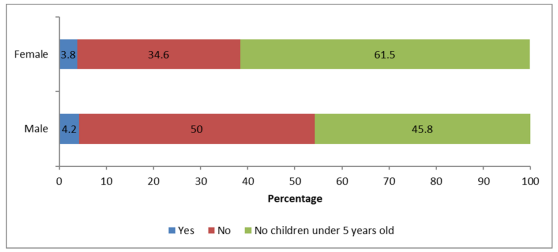


Figure 59: Whether some of under 5 year old children are stunted by sex of household head in Gonde

Source: Household Survey Data, December/2019 –January/2020

In Ude Dhankaka, all of the households with stunted under 5 children are female headed households (figure 61).

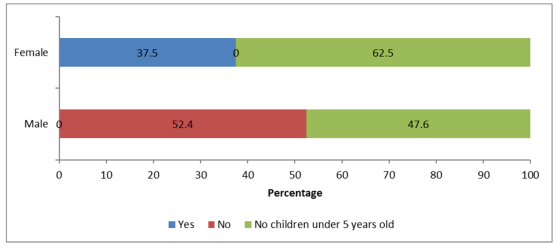


Figure 60: Whether some of under 5 year old children are stunted by sex of household head in Ude Dhankaka

Source: Household Survey Data, December/2019 –January/2020

In Areda, there are no households with stunted under 5 children (figure 62).

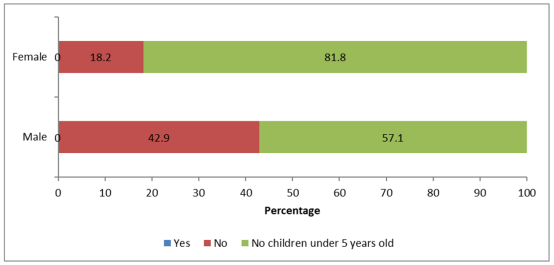


Figure 61: Whether some of under 5 year old children are stunted by sex of household head in Areda

Source: Household Survey Data, December/2019 –January/2020

In Biyo, all of the households with stunted under 5 children are male headed households (figure 63).

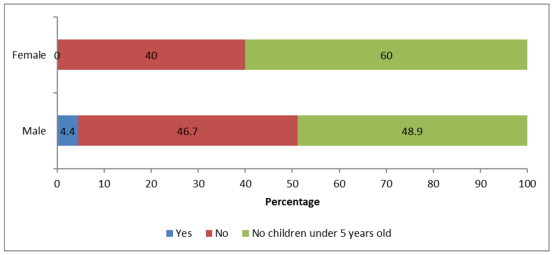


Figure 62: Whether some of under 5 year old children are stunted by sex of household head in Biyo

Source: Household Survey Data, December/2019 –January/2020

In Kamise, there are no households with stunted under 5 children (figure 64).

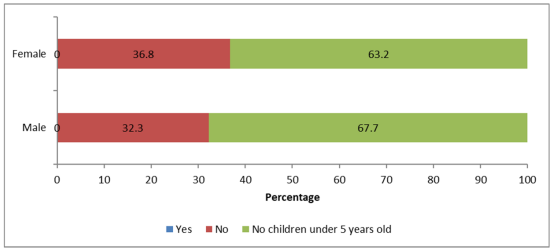


Figure 63: Whether some of under 5 year old children are stunted by sex of household head in Kamise

Source: Household Survey Data, December/2019 –January/2020

3.1.4.7 Whether Under 5 Children are wasted

In this regard, the proportions of households with wasted under 5 children is very minimal (as low as 0.0% in Kamise to 6.0% in Aseko and Gonde) (table 37).

Table 35: Whether under 5 children are wasted (%)

Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Yes	6.0	2.0	6.0	4.0	2.0	2.0	0.0	3.1
No, he/she/they are in good health	42.0	54.0	40.0	46.0	32.0	46.0	34.0	42.0
Our family does not have children under 5 years old	50.0	44.0	52.0	50.0	66.0	52.0	66.0	54.3
N/K	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

Further analysis was made to look at the proportion of households with wasted children of under 5 years old versus sex of household heads as captured by table 38.

Table 36: Whether some of under 5 year old children are wasted by sex of household head (%)

Sex of the household head	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Male	Yes	4.9	2.5	4.2	0.0	0.0	2.2	0.0	2.0
	No	41.5	50.0	50.0	52.4	46.4	46.7	35.5	46.2
	No children under 5 years old	53.7	47.5	45.8	47.6	53.6	51.1	64.5	51.8
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Female	Yes	11.1	0.0	7.7	25.0	4.5	0.0	0.0	6.1
	No	44.4	70.0	30.8	12.5	13.6	40.0	31.6	31.3
	No children under 5 years old	33.3	30.0	57.7	62.5	81.8	60.0	68.4	60.6
	N/K	11.1	0.0	3.8	0.0	0.0	0.0	0.0	2.0
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

In Aseko, majority of the households with wasted under 5 children are female headed households (figure 65).

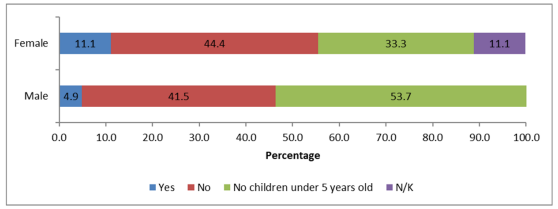


Figure 64: Whether some of under 5 year old children are wasted by sex of household head in Aseko

Source: Household Survey Data, December/2019 –January/2020

In Bolo, all of the households with wasted under 5 children are male headed households (figure 66).

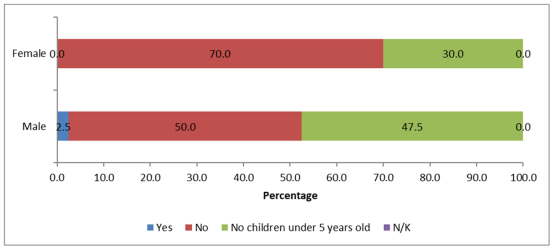


Figure 65: Whether some of under 5 year old children are wasted by sex of household head in Bolo

Source: Household Survey Data, December/2019 –January/2020

In Gonde, majority of the households with wasted under 5 children are female headed households (figure 67).

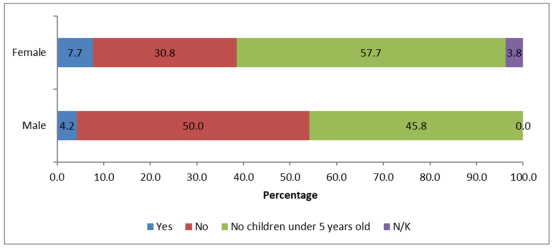


Figure 66: Whether some of under 5 year old children are wasted by sex of household head in Gonde

Source: Household Survey Data, December/2019 –January/2020

In Ude Dhankaka, all of the households with wasted under 5 children are female headed households (figure 68).

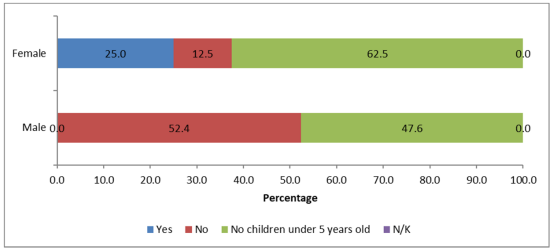


Figure 67: Whether some of under 5 year old children are wasted by sex of household head in Ude Dhankaka

Source: Household Survey Data, December/2019 –January/2020

In Areda, all of the households with wasted under 5 children are female headed households (figure 69).

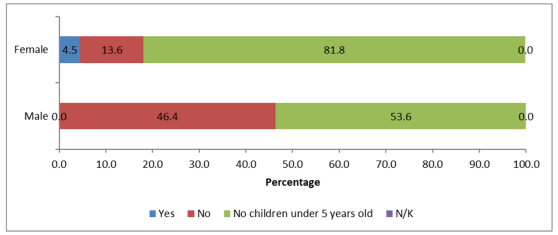


Figure 68: Whether some of under 5 year old children are wasted by sex of household head in Areda

Source: Household Survey Data, December/2019 –January/2020

In Biyo, all of the households with wasted under 5 children are male headed households (figure 70).

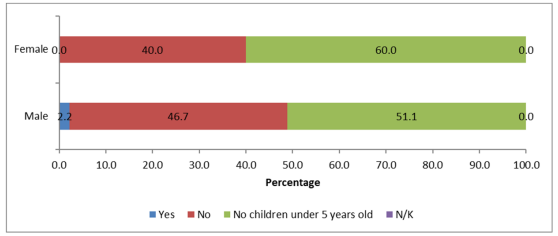


Figure 69: Whether some of under 5 year old children are wasted by sex of household head in Biyo

Source: Household Survey Data, December/2019 –January/2020

In Kamise. there are no households with wasted under 5 children (figure 71).

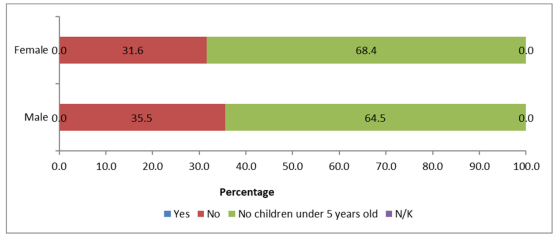


Figure 70: Whether some of under 5 year old children are wasted by sex of household head in Kamise

Source: Household Survey Data, December/2019 –January/2020

3.1.4.8 Whether Under 5 Children are Underweight

In this regard, the proportions of households with underweight under 5 children are very minimal (8.0% in Bolo, Ude Dhankaka, Biyo and Kamise; 10.0% in Areda, 12.0% in Gonde and 14.0% in Aseko) (table 39).

Table 37: Whether under 5 children are underweight (%)

Response	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Yes	14.0	8.0	12.0	8.0	10.0	8.0	8.0	9.7
No, he/she/they are in good health	40.0	46.0	44.0	48.0	34.0	46.0	38.0	42.3

Our family does not have children under 5 years old	46.0	44.0	42.0	44.0	56.0	46.0	52.0	47.1
N/K	0.0	2.0	2.0	0.0	0.0	0.0	2.0	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

Further analysis was made to look at the proportions of households with underweight children of under 5 years old versus sex of household heads as captured by table 40.

Table 38: Whether some of under 5 year old children are underweight by sex of household head (%)

Sex of the household head	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Male	Yes	9.8	10.0	4.2	4.8	3.6	8.9	6.5	7.2
	No	41.5	42.5	58.3	54.8	46.4	46.7	38.7	46.6
	No children under 5 years old	48.8	47.5	37.5	40.5	50.0	44.4	51.6	45.8
	N/K	0.0	0.0	0.0	0.0	0.0	0.0	3.2	.4
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Female	Yes	33.3	0.0	19.2	25.0	18.2	0.0	10.5	16.2
	No	33.3	60.0	30.8	12.5	18.2	40.0	36.8	31.3
	No children under 5 years old	33.3	30.0	46.2	62.5	63.6	60.0	52.6	50.5
	N/K	0.0	10.0	3.8	0.0	0.0	0.0	0.0	2.0
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

In Aseko, majority of the households with underweight under 5 children are female headed households (figure 72).

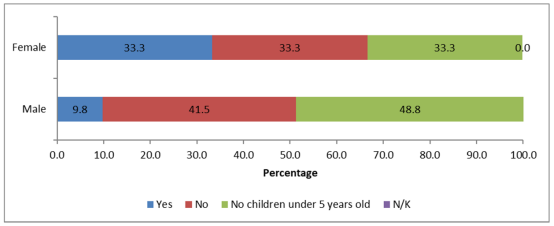


Figure 71: Whether some of under 5 year old children are underweight by sex of household head in Aseko

Source: Household Survey Data, December/2019 –January/2020

In Bolo, all of the households with underweight under 5 children are male headed households (figure 73).

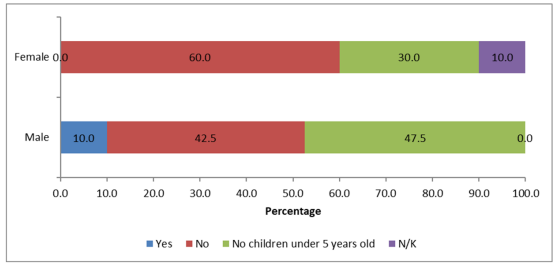


Figure 72: Whether some of under 5 year old children are underweight by sex of household head in Bolo

Source: Household Survey Data, December/2019 –January/2020

In Gonde, majority of the households with underweight under 5 children are female headed households (figure 74).

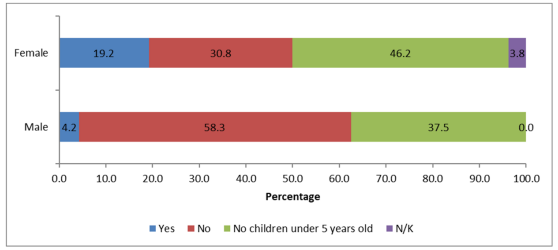


Figure 73: Whether some of under 5 year old children are underweight by sex of household head in Gonde

Source: Household Survey Data, December/2019 –January/2020

In Ude Dhankaka, majority of the households with underweight under 5 children are female headed households (figure 75).

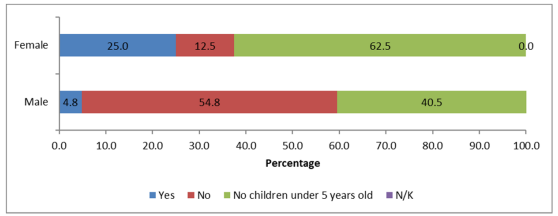


Figure 74: Whether some of under 5 year old children are underweight by sex of household head in Ude Dhankaka

Source: Household Survey Data, December/2019 –January/2020

In Areda, majority of the households with underweight under 5 children are female headed households (figure 76).

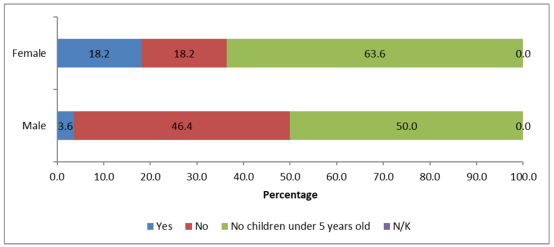


Figure 75: Whether some of under 5 year old children are underweight by sex of household head in Areda

Source: Household Survey Data, December/2019 –January/2020

In Biyo, all of the households with underweight under 5 children are male headed households (figure 77).

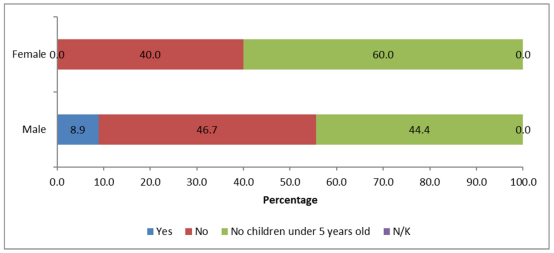


Figure 76: Whether some of under 5 year old children are underweight by sex of household head in Biyo

Source: Household Survey Data, December/2019 –January/2020

In Kamise, majority of the households with underweight under 5 children are female headed households (figure 78).

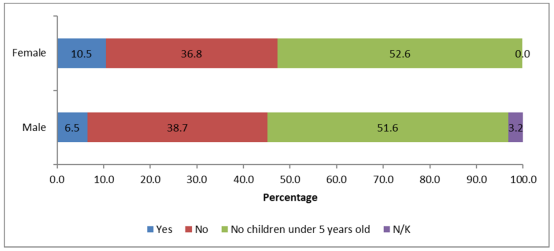


Figure 77: Whether some of under 5 year old children are underweight by sex of household head in Kamise

Source: Household Survey Data, December/2019 –January/2020

3.1.5 Education

3.1.5.1 Whether the Family Has Primary/Secondary School-age Children

Figure 79 presents that except Areda (62.0%), 70.0% and above of the households in Aseko, Bolo, Gonde, Ude Dhankaka, Biyo and Kamise responded that there are primary/secondary school-age children in the household.

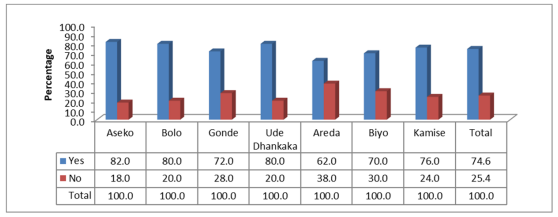


Figure 78: Whether the family has primary/secondary school-age children

Source: Household Survey Data, December/2019 –January/2020

The finding (table 41) reveals the majority of the households have 1 to 3 primary / secondary school age children (95.1% in Aseko, 80.0% in Bolo, 86.1% in Gonde, 87.5% in Ude Dhankaka, 87.1% in Areda, 88.5% in Biyo and 76.4% in Kamise). As captured by figure 80, the majority from all the seven towns indicated that there are 1 to 3 such children in the household.

Table 39: Number of primary/secondary school-age children (%)

Number of Children	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
1	26.8	40.0	36.1	35.0	48.4	51.4	31.6	37.9
2	46.3	22.5	41.7	37.5	22.6	20.0	23.7	31.0
3	22.0	17.5	8.3	15.0	16.1	17.1	21.1	16.9
4	2.4	5.0	8.3	12.5	12.9	11.4	13.2	9.2
5	2.4	5.0	2.8	0.0	0.0	0.0	2.6	1.9
6	0.0	5.0	2.8	0.0	0.0	0.0	7.9	2.3
9	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.4
12	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

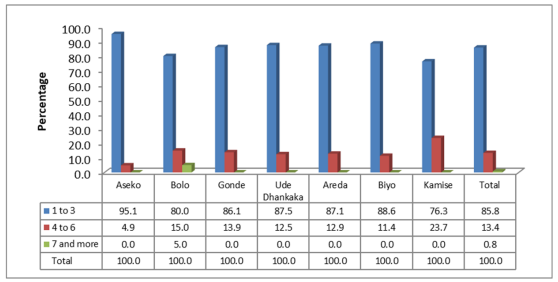


Figure 79: Number of primary/secondary school-age children

Source: Household Survey Data, December/2019 –January/2020

3.1.5.2 Whether the School-age Children were absent from Schools in Last Term

Respondents were also asked whether primary / secondary school-age children of the family were absent from school in the last term. Accordingly, figure 81 depicts that 18.0% in Aseko, 14.0% in Bolo, 8.0% in Gonde, 12.0% in Ude Dhankaka, 10.0% in Areda, 8.0% in Biyo and 16.0% in Kamise were absent from school during the last term.

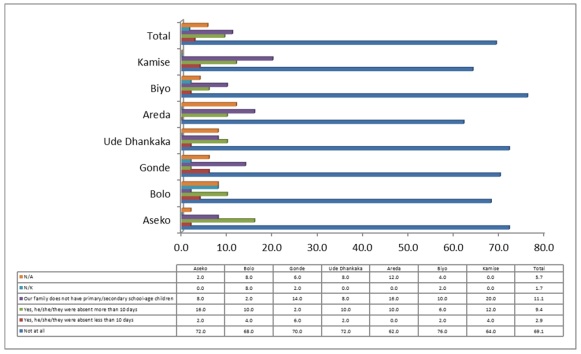


Figure 80: Whether the school-age children were absent from schools in last term

Source: Household Survey Data, December/2019 –January/2020

Further analysis was made to look at school attendance versus sex of household heads as captured by table 42.

Table 40: School attendance by sex of household head (%)

Sex of the household head	Whether absent	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Male	Not at all	65.9	75.0	79.2	71.4	50.0	75.6	67.7	69.7
	Yes	21.9	10.0	4.2	11.9	17.9	6.7	16.1	12.8
	No school-age children	9.8	0.0	4.2	9.5	17.9	11.1	16.1	9.6
	N/K	0.0	7.5	4.2	0.0	0.0	2.2	0.0	2.0
	N/A	2.4	7.5	8.3	7.1	14.3	4.4	0.0	6.0
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Female	Not at all	100.0	40.0	61.5	75.0	77.3	80.0	57.9	67.7
	Yes	0.0	30.0	11.5	12.5	0.0	20.0	15.8	11.2
	No school-age children	0.0	10.0	23.1	0.0	13.6	0.0	26.3	15.2
	N/K	0.0	10.0	0.0	0.0	0.0	0.0	0.0	1.0
	N/A	0.0	10.0	3.8	12.5	9.1	0.0	0.0	5.1
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Household Survey Data, December/2019 –January/2020

In Aseko, there are no female headed households with absentees while all of the households with absentees are male headed households (figure 82).

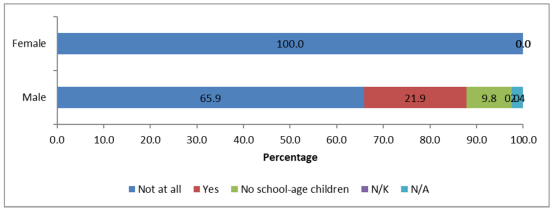


Figure 81: School attendance by sex of household head in Aseko

Source: Household Survey Data, December/2019 –January/2020

In Bolo, majority (30.0%) of the households with absentees are female headed households (figure 83).

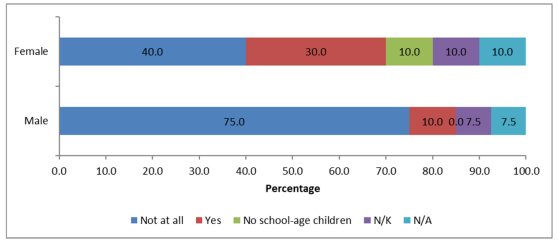


Figure 82: School attendance by sex of household head in Bolo

Source: Household Survey Data, December/2019 –January/2020

In Gonde, majority (11.5%) of the households with absentees are female headed households (figure 84).

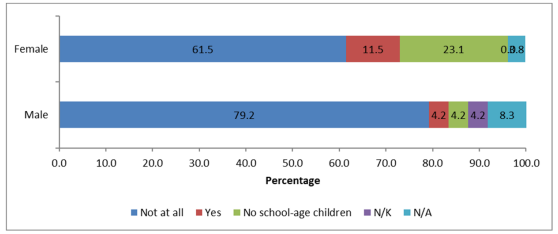


Figure 83: School attendance by sex of household head in Gonde

Source: Household Survey Data, December/2019 –January/2020

In Ude Dhankaka, nearly equal proportions of the households with absentees are both female and male headed households (figure 85).

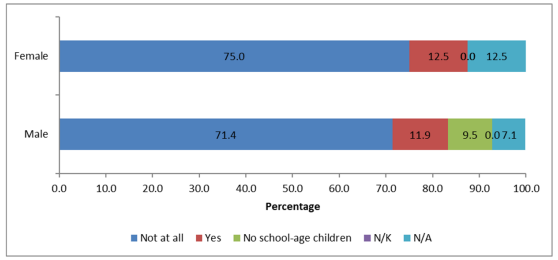


Figure 84: School attendance by sex of household head in Ude Dhankaka

Source: Household Survey Data, December/2019 –January/2020

In Areda, all of the households with absentees are male headed households (figure 86).

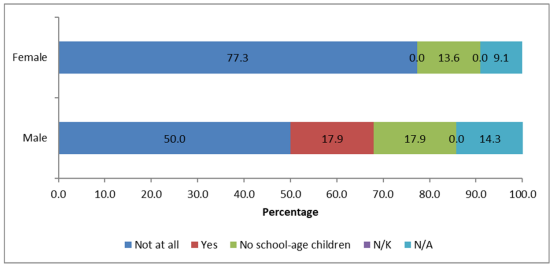


Figure 85: School attendance by sex of household head in Areda

Source: Household Survey Data, December/2019 –January/2020

In Biyo, majority (20.0%) of the households with absentees are female headed households (figure 87).

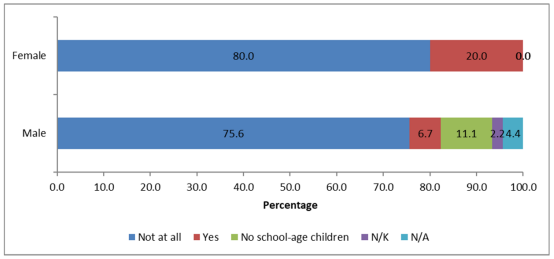


Figure 86: School attendance by sex of household head in Biyo

Source: Household Survey Data, December/2019 –January/2020

In Kamise, nearly equal proportions of the households with absentees are both female and male headed households (figure 88).

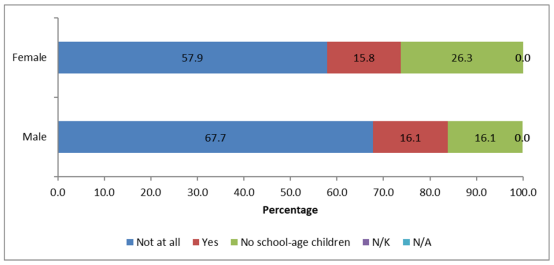
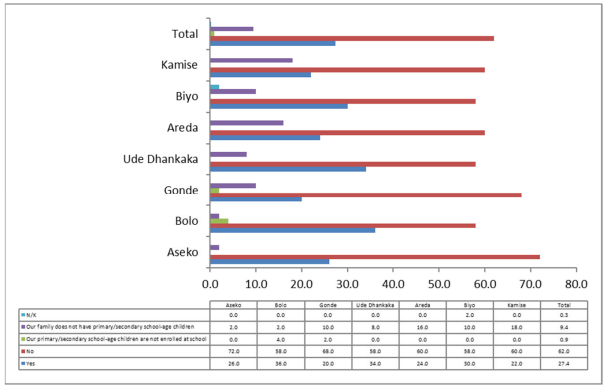


Figure 87: School attendance by sex of household head in Kamise

Source: Household Survey Data, December/2019 –January/2020

3.1.5.3 Whether Received Education Messages Regarding Hygiene and Sanitation from School-age Children

Respondents were requested to comment on whether received education messages regarding hygiene and sanitation from school-age children. Accordingly, as captured by figure 89, large proportions of the respondents from all the seven small towns with 58.0% in Biyo, Ude Dhankaka and Bolo to as large as 72.0% in Aseko indicated that there are no such experiences so far.



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
N/K	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.3
Our family does not have primary/secondary school-age children	2.0	2.0	10.0	8.0	16.0	10.0	18.0	9.4
Our primary/secondary school-age children are not enrolled at school	0.0	4.0	2.0	0.0	0.0	0.0	0.0	0.9
No	72.0	58.0	68.0	58.0	60.0	58.0	60.0	62.0
Yes	26.0	36.0	20.0	34.0	24.0	30.0	22.0	27.4

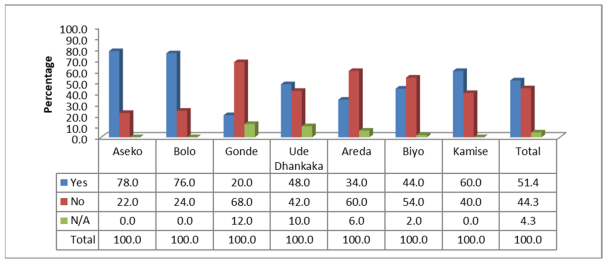
Figure 88: Whether received education messages regarding hygiene and sanitation from school-age children

Source: Household Survey Data, December/2019 –January/2020

3.1.6 Miscellaneous Issues on Access to Water

3.1.6.1 Whether Seen or Involved in Argument/Vandalism/Conflict about Water Supply among Community at Water Sources

As to whether involved in argument/vandalism/conflict about water supply among community at water sources, respondents in Aseko (78.0%), Bolo (76.0%) and Kamise (60.0%) confirmed involvement in such cases (figure 90). Less involvement is reported in Gonde (20.0%), Areda (34.0%) and Biyo (44.00%) while it is nearly in balance in Ude Dhankaka (48.0% and 42.0%, respectively).



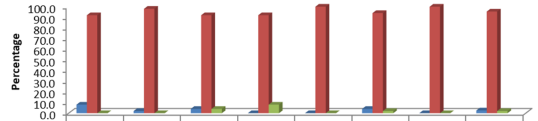
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Yes	78.0	76.0	20.0	48.0	34.0	44.0	60.0	51.4
No	22.0	24.0	68.0	42.0	60.0	54.0	40.0	44.3
N/A	0.0	0.0	12.0	10.0	6.0	2.0	0.0	4.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 89: Whether seen or involved in argument/vandalism/conflict about water supply among community at water sources

Source: Household Survey Data, December/2019 –January/2020

3.1.6.2 Whether Seen or Involved in Ethnic Conflict about Water Supply among Community at Water Sources

Respondents were also asked whether involved in ethnic conflict about water supply among community at water sources. In this regard (figure 91), 92.0% and above of the respondents from all the seven small towns indicated that there are no such incidences.



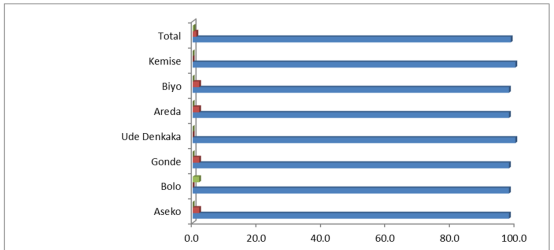
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
Yes	8.0	2.0	4.0	0.0	0.0	4.0	0.0	2.6
No	92.0	98.0	92.0	92.0	100.0	94.0	100.0	95.4
N/A	0.0	0.0	4.0	8.0	0.0	2.0	0.0	2.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 90: Whether seen or involved in ethnic conflict about water supply among community at water sources

Source: Household Survey Data, December/2019 –January/2020

3.1.6.3 Willingness to Pay for New Water Facility Construction

Respondents were also asked to comment on their willingness for payment for new water construction, and accordingly, the large majority of the respondents (98.0% and above) confirmed their readiness (figure 92) in all the seven towns.



	Aseko	Bolo	Gonde	Ude Denkaka	Areda	Biyo	Kemise	Total
No, we don't need new facility construction	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.3
No, we will not pay/we don't want to pay	2.0	0.0	2.0	0.0	2.0	2.0	0.0	1.1
Yes, we will pay	98.0	98.0	98.0	100.0	98.0	98.0	100.0	98.6

Figure 91: Willingness to pay for new water facility construction

Source: Household Survey Data, December/2019 –January/2020

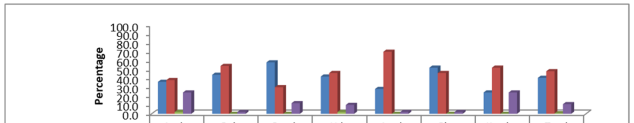
3.1.6.4 Proposed Price for 20 Liter Water

Lastly, households were also consulted to propose price for 20 liter water and most of them proposed 0.50 cents except Gonde where 0.25 cents is proposed (table 43). Figure 93 also asserts same.

Table 41: Proposed price for 20 liter water (Birr)

Town	Minimum	Mean	Median	Mode	Maximum	Range	Valid N
Aseko	0.10	0.52	0.50	0.50	1.00	0.90	50
Bolo	0.10	0.35	0.30	0.50	1.00	0.90	50
Gonde	0.10	0.37	0.25	0.25	1.00	0.90	50
Ude Dhankaka	0.10	0.44	0.50	0.50	1.00	0.90	50
Areda	0.10	0.43	0.50	0.50	1.00	0.90	50
Biyo	0.10	0.36	0.25	0.50	1.00	0.90	50
Kamise	0.10	0.55	0.50	0.50	1.00	0.90	50

Source: Household Survey Data, December/2019 –January/2020



	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	Total
25 cents and less	36.0	44.0	58.0	42.0	28.0	52.0	24.0	40.6
26 cents - 50 cents	38.0	54.0	30.0	46.0	70.0	46.0	52.0	48.0
51 cents - 75 cents	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.6
76 cents - 1 Birr	24.0	2.0	12.0	10.0	2.0	2.0	24.0	10.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 92: Proposed price for 20 liter water

Source: Household Survey Data, December/2019 –January/2020

3.2 School Survey

3.2.1 Categories of Schools Surveyed

In total, 15 schools were covered by the survey (one technical and vocational institute, one preparatory school, nine primary schools and four secondary schools) (table 44). Note that the Muslim student center in Bolo is not included because it is not regularly opened and Nati Youth Academy is also not included because it is private.

Table 42: Number of Schools by School Category (number of schools)

Category of School	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Primary	1	1	1	3	1	1	1	9
Secondary	1	1	0	1	1	0	0	4
Preparatory	1	0	0	0	0	0	0	1
Other	1	0	0	0	0	0	0	1
Total	4	2	1	4	2	1	1	15

Source: School Survey Data, December/2019 –January/2020

3.2.2 Facility Condition

3.2.2.1 Water Source

Out of the 15 schools covered by the survey, only one school in Bolo (table 45) confirmed availability of water source on the school premise which is public tap (table 46), partially available/operational (with occasional technical downtime, which means water is not available most of the time) (table 47).

Table 43: Whether water source is available on the school premise (number of schools)

Category of School	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Primary	Yes	0	1	0	0	0	0	0	1
	No	1	0	1	3	1	1	1	8
Secondary	Yes	0	0	0	0	0	0	0	0
	No	1	1	0	1	1	0	0	4
Preparatory	Yes	0	0	0	0	0	0	0	0
	No	1	0	0	0	0	0	0	1
Other	Yes	0	0	0	0	0	0	0	0
	No	1	0	0	0	0	0	0	1
Total		4	2	1	4	2	1	1	15

Source: School Survey Data, December/2019 –January/2020

Table 44: Type of water source available on the school premise (number of schools)

Category of School	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Primary	Public tap (Piped water facility)	0	1	0	0	0	0	0	1
	No, there is no water source on the premise	1	0	1	3	1	1	1	8
Secondary	No, there is no water source on the premise	1	1	0	1	1	0	0	4
Preparatory	No, there is no water source on the premise	1	0	0	0	0	0	0	1
Other	No, there is no water source on the premise	1	0	0	0	0	0	0	1
Total		4	2	1	4	2	1	1	15

Source: School Survey Data, December/2019 –January/2020

Table 45: Whether water source available is functional (number of schools)

Category of School	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Primary	Partially available/operational (with occasional technical downtime)	0	1	0	0	0	0	0	1
	No, there is no water source on the premise	1	0	1	3	1	1	1	8
Secondary	No, there is no water source on the premise	1	1	0	1	1	0	0	4
Preparatory	No, there is no water source on the premise	1	0	0	0	0	0	0	1
Other	No, there is no water source on the premise	1	0	0	0	0	0	0	1
Total		4	2	1	4	2	1	1	15

Source: School Survey Data, December/2019 –January/2020

3.2.2.2 Latrine Possession

Regarding type of latrines for girls, the finding (table 48) reveals that all of the existing latrines are unimproved latrines such as bucket toilet, pit latrines without slabs or open pit.

Table 46: Availability by type of latrines for girls (number of schools)

Category of School	Response	Town						
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise
Primary	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	1	1	3	1	1	1
	Other	0	0	0	0	0	0	0
Secondary	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	1	0	1	1	0	0
	Other	0	0	0	0	0	0	0

Category of School	Response	Town						
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise
Preparatory	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0
Other	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0

Source: School Survey Data, December/2019 –January/2020

Regarding number of stances for girls, the finding (table 49) reveals that all of the girls use only one stance in schools in Biyo and Kamise.

Table 47: Statistics on number of stances for girls

Town	Category of School	Number of stances	Number of schools
Aseko	Primary	4	1
	Secondary	8	1
	Preparatory	3	1
	Other	2	1
Bolo	Primary	3	1
	Secondary	4	1
Gonde	Primary	4	1
Ude Dhankaka	Primary	13	3
	Secondary	8	1
Areda	Primary	3	1
	Secondary	8	1
Biyo	Primary	1	1
Kamise	Primary	1	1

Source: School Survey Data, December/2019 –January/2020

Regarding type of latrines for boys, the finding (table 50) reveals that all of the existing latrines are unimproved latrines such as bucket toilet, pit latrines without slabs or open pit.

Table 48: Availability by type of latrines for boys (number of schools)

Category of School	Response	Town						
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise
Primary	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	1	1	3	1	1	1
	Other	0	0	0	0	0	0	0
Secondary	[Improved] flush toilet to piped sewer systems, septic tanks, pit	0	0	0	0	0	0	0

Category of School	Response	Town						
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise
	latrine or equipment that can be treated hygienically							
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	1	0	1	1	0	0
	Other	0	0	0	0	0	0	0
Preparatory	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0
Other	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0

Source: School Survey Data, December/2019 –January/2020

Regarding number of stances and urinals for boys, the finding (table 51) shows that there are no urinals for boys on the premises of all the schools, which means that the boys use the stances for urine.

Table 49: Statistics on number of stances and urinals for boys

Town	Category of School	Number of stances	Number of urinals	Number of schools
Aseko	Primary	4	0	1
	Secondary	8	0	1
	Preparatory	4	0	1
	Other	2	0	1
Bolo	Primary	4	0	1
	Secondary	4	0	1
Gonde	Primary	4	0	1
Ude Dhankaka	Primary	13	0	3
	Secondary	8	0	1
Areda	Primary	3	0	1
	Secondary	8	0	1
Biyo	Primary	1	0	1
Kamise	Primary	2	0	1

Source: School Survey Data, December/2019 –January/2020

Regarding type of latrines for teachers, the finding (table 52) reveals that the latrine are unimproved latrines such as bucket toilet, pit latrines without slabs or open pit.

Table 50: Availability by type of latrines for teachers (number of schools)

Category of School	Response	Town						
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise
Primary	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	1	1	3	1	1	1
	Other	0	0	0	0	0	0	0
Secondary	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	1	0	1	1	0	0
	Other	0	0	0	0	0	0	0
Preparatory	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0
Other	[Improved] flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	0	0	0	0	0
	[Improved]: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	0	0	0	0	0	0	0
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0

Source: School Survey Data, December/2019 –January/2020

Regarding number of stances and urinals for teachers, the finding (table 53) shows that there are no urinals for teachers on the premises of all the schools, which means that the male teachers use the stances for urine.

Table 51: Statistics on number of stances and urinals for teachers

Town	Category of School	Number of stances	Number of urinals	Number of schools
Aseko	Primary	4	0	1
	Secondary	3	0	1
	Preparatory	3	0	1
	Other	2	0	1
Bolo	Primary	1	0	1
	Secondary	2	0	1
Gonde	Primary	2	0	1
Ude Dhankaka	Primary	4	0	3
	Secondary	2	0	1
Areda	Primary	6	0	1
	Secondary	2	0	1
Biyo	Primary	1	0	1

Kamise	Primary	1	0	1

Source: School Survey Data, December/2019 –January/2020

Regarding whether the toilets are separated for girls and boys or not, the finding (table 54) shows that the toilets are not separated in one school in Aseko, one school in Ude Dhankaka and one school in Biyo.

Table 52: Whether toilets are separated for girls and boys (number of schools)

Category of School	Environments	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Primary	Separated	1	1	1	2	1	0	1	7
	Not separated	0	0	0	1	0	1	0	2
Secondary	Separated	1	1	0	1	1	0	0	4
Preparatory	Separated	1	0	0	0	0	0	0	1
Other	Not separated	1	0	0	0	0	0	0	1
Total		4	2	1	4	2	1	1	15

Source: School Survey Data, December/2019 –January/2020

3.2.2.3 Menstrual Hygiene Management

Table 55 shows that regarding menstrual hygiene facilities for adolescent girls, there is no any specially designed room or toilet for MHM on all school premises.

Table 53: Whether there are menstrual hygiene facilities for adolescent girls on the school premise (number of schools)

Category of School	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Primary	Yes, there is specially designed room/toilet for menstrual hygiene management (MHM)	0	0	0	0	0	0	0	0
	No, there is no any specially-designed room/toilet for MHM	1	1	1	3	1	1	1	9
Secondary	Yes, there is specially designed room/toilet for menstrual hygiene management (MHM)	0	0	0	0	0	0	0	0
	No, there is no any specially-designed room/toilet for MHM	1	1	0	1	1	0	0	4
Preparatory	Yes, there is specially designed room/toilet for menstrual hygiene management (MHM)	0	0	0	0	0	0	0	0
	No, there is no any specially-designed room/toilet for MHM	1	0	0	0	0	0	0	1
Other	Yes, there is specially designed room/toilet for menstrual hygiene management (MHM)	0	0	0	0	0	0	0	0
	No, there is no any specially-designed room/toilet for MHM	1	0	0	0	0	0	0	1
Total		4	2	1	4	2	1	1	15

Source: School Survey Data, December/2019 –January/2020

3.2.2.4 Hand Washing Facilities

Regarding hand washing facilities on school premises, there is no hand washing facility or soap on the premises of the all schools contacted (table 56).

Table 54: Whether there are hand washing facilities on the school premise (number of schools)

Category of School	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Primary	Yes, there is hand washing facility with soap	0	0	0	0	0	0	0	0
	Yes, there is hand washing facility without soap	0	0	0	0	0	0	0	0

Category of School	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
	No, there is no hand washing facility but there is only soap	0	0	0	0	0	0	00	
	No, there is no hand washing facility or soap	1	1	1	3	1	1	1	9
Secondary	Yes, there is hand washing facility with soap	0	0	0	0	0	0	0	0
	Yes, there is hand washing facility without soap	0	0	0	0	0	0	0	0
	No, there is no hand washing facility but there is only soap	0	0	0	0	0	0	0	0
	No, there is no hand washing facility or soap	1	1	0	1	1	0	0	4
Preparatory	Yes, there is hand washing facility with soap	0	0	0	0	0	0	0	0
	Yes, there is hand washing facility without soap	0	0	0	0	0	0	0	0
	No, there is no hand washing facility but there is only soap	0	0	0	0	0	0	0	0
	No, there is no hand washing facility or soap	1	0	0	0	0	0	0	1
Other	Yes, there is hand washing facility with soap	0	0	0	0	0	0	0	0
	Yes, there is hand washing facility without soap	0	0	0	0	0	0	0	0
	No, there is no hand washing facility but there is only soap	0	0	0	0	0	0	0	0
	No, there is no hand washing facility or soap	1	0	0	0	0	0	0	1
Total		4	2	1	4	2	1	1	15

Source: School Survey Data, December/2019 –January/2020

3.2.3 School Attendance

Schools were also requested to provide total enrolment, current attendance, dropouts and number of pupils enrolled but never attended classes. Accordingly, table 57 captures the enrolment data while table 58 presents data on number of pupils attending classes during the survey period. Regarding dropouts, as captured by table 59, very few pupils had dropped out from schools in Bolo, Ude Dhankaka, Areda and Biyo. Regarding pupils enrolled but never attended classes, the finding (table 60) shows there were no cases of enrolled but not attended classes in all of the schools.

Table 55: Number of students enrolled (persons)

Town	Sex	Category of School							
		Primary		Secondary		Preparatory		Other	
		Number of Students	N	Number of Students	N	Number of Students	N	Number of Students	N
Aseko	Girls	893	1	565	1	154	1	34	1
	Boys	810	1	835	1	258	1	49	1
Bolo	Girls	630	1	273	1	N/A	N/A	N/A	N/A
	Boys	625	1	341	1	N/A	N/A	N/A	N/A
Gonde	Girls	398	1	N/A	N/A	N/A	N/A	N/A	N/A
	Boys	424	1	N/A	N/A	N/A	N/A	N/A	N/A
Ude Dhankaka	Girls	651	3	246	1	N/A	N/A	N/A	N/A
	Boys	660	3	344	1	N/A	N/A	N/A	N/A
Areda	Girls	263	1	60	1	N/A	N/A	N/A	N/A
	Boys	258	1	80	1	N/A	N/A	N/A	N/A
Biyo	Girls	58	1	N/A	N/A	N/A	N/A	N/A	N/A
	Boys	76	1	N/A	N/A	N/A	N/A	N/A	N/A
Kamise	Girls	224	1	N/A	N/A	N/A	N/A	N/A	N/A
	Boys	290	1	N/A	N/A	N/A	N/A	N/A	N/A

N = Number of schools

Source: School Survey Data, December/2019 –January/2020

Table 56: Students attending classes during the survey time

Town	Sex	Category of School											
		Primary			Secondary			Preparatory			Other		
		Number of Students	%	N	Number of Students	%	N	Number of Students	%	N	Number of Students	%	N
Aseko	Girls	893	100.0	1	565	100.0	1	154	100.0	1	34	100.0	1
	Boys	810	100.0	1	835	100.0	1	258	100.0	1	49	100.0	1
Bolo	Girls	630	100.0	1	269	98.5	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A
	Boys	625	100.0	1	336	98.5	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A
Gonde	Girls	398	100.0	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A	N/A.	N/A.	N/A
	Boys	424	100.0	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A	N/A.	N/A.	N/A
Ude Dhankaka	Girls	644	98.9	3	241	98.0	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A
	Boys	756	99.5	3	339	98.5	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A
Areda	Girls	257	97.7	1	60	100.0	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A
	Boys	254	98.4	1	80	100.0	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A
Biyo	Girls	42	72.4	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A	N/A.	N/A.	N/A
	Boys	55	72.4	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A	N/A.	N/A.	N/A
Kamise	Girls	224	100.0	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A	N/A.	N/A.	N/A
	Boys	290	100.0	1	N/A.	N/A.	N/A	N/A.	N/A.	N/A	N/A.	N/A.	N/A

N = Number of schools

% = Proportion of those attending classes to total enrolment

Source: School Survey Data, December/2019 –January/2020

Table 57: Students dropped out of school

Town	Sex	Category of School											
		Primary			Secondary			Preparatory			Other		
		Number of Students	%	N	Number of Students	%	N	Number of Students	%	N	Number of Students	%	N
Aseko	Girls	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1
	Boys	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1
Bolo	Girls	0	0.0	1	4	1.5	1	N/A.	N/A	N/A	N/A.	N/A.	N/A
	Boys	0	0.0	1	5	1.5	1	N/A.	N/A	N/A	N/A.	N/A.	N/A
Gonde	Girls	0	0.0	1	N/A.	N/A.	N/A	N/A.	N/A	N/A	N/A.	N/A.	N/A
	Boys	0	0.0	1	N/A.	N/A.	N/A	N/A.	N/A	N/A	N/A.	N/A.	N/A
Ude Dhankaka	Girls	7	1.1	3	5	2.0	1	N/A.	N/A	N/A	N/A.	N/A.	N/A
	Boys	4	0.5	3	5	1.5	1	N/A	N/A	N/A	N/A.	N/A.	N/A
Areda	Girls	6	2.3	1	0	0.0	1	N/A.	N/A	N/A	N/A.	N/A.	N/A

	Boys	4	1.6	1	0	0.0	1	N/A.	N/A	N/A	N/A.	N/A.	N/A
Biyo	Girls	16	27.6	1	N/A.	N/A.	N/A	N/A.	N/A	N/A	N/A.	N/A.	N/A
	Boys	21	27.6	1	N/A.	N/A.	N/A	N/A.	N/A	N/A	N/A.	N/A.	N/A
Kamise	Girls	0	0.0	1	N/A.	N/A.	N/A	N/A.	N/A	N/A	N/A.	N/A.	N/A
	Boys	0	0.0	1	N/A.	N/A.	N/A	N/A.	N/A	N/A	N/A.	N/A.	N/A

N = Number of schools

% = Proportion of dropouts to total enrolment

Source: School Survey Data, December/2019 –January/2020

Table 58: Students enrolled but never attended classes

Town	Sex	Category of School											
		Primary			Secondary			Preparatory			Other		
		Number of Students	%	N	Number of Students	%	N	Number of Students	%	N	Number of Students	%	N
Aseko	Girls	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1
	Boys	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1
Bolo	Girls	0	0.0	1	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A
	Boys	0	0.0	1	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A
Gonde	Girls	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Boys	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ude Dhankaka	Girls	0	0.0	3	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A
	Boys	0	0.0	3	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A
Areda	Girls	0	0.0	1	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A
	Boys	0	0.0	1	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A
Biyo	Girls	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Boys	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kamise	Girls	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Boys	0	0.0	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N = Number of schools

% = Proportion of enrolled but never attended classes to total enrolment

Source: School Survey Data, December/2019 –January/2020

3.2.4 Hygiene Behaviour

Twenty five students each from boys and girls were randomly selected and asked whether fetched water a day before the interview date. The finding (table 61) shows that the proportion of girls who fetched water is as low as 24.1% in Biyo and as high as 100.0% in Aseko while their male counterparts (boys) is as low as 12.0% in Areda and as high as 100.0% in Aseko and Biyo.

Table 59: Whether fetched water

Town	Category of School	Girl						Boy					
		Yes, outside home		Yes, private connection		No didn't fetch		Yes, outside home		Yes, private connection		No didn't fetch	
		Girls	%	Girls	%	Girls	%	Boys	%	Boys	%	Boys	%
Aseko	Primary	13	52.0	0	0.0	12	48.0	5	20.0	0	0.0	20	80.0
	Secondary	16	64.0	0	0.0	9	36.0	17	68.0	0	0.0	8	32.0
	Preparatory	17	68..0	0	0.0	8	32..0	17	68.0	0	0.0	8	32.0 0
	Other	25	100.0	0	0.0	0	0.0	25	100.0	0	0.0	0	0.0
Bolo	Primary	19	76.0	0	0.0	6	24.0	7	28.0	0	0.0	18	72.0
	Secondary	21	84.0	0	0.0	4	16.0	17	68.0	0	0.0	8	32.0
Gonde	Primary	8	32.0	0	0.0	17	68.0	13	52.0	0	0.0	12	48.0
Ude Dhankaka	Primary (3 schools)	26	34.7	.0	0.0	49	65.3	31	41.3	0	0.0	44	58.7
	Secondary	17	68..0	0	0.0	8	32..0	13	52.0	0	0.0	12	48.0
Areda	Primary	10	40.0	0	0.0	15	60.0	12	48.0	0	0.0	13	52.0
	Secondary	4	16.0	0	0.0	21	84.0	3	12.0	0	0.0	22	88.0
Biyo	Primary	14	56.0	0	0.0	11	44.0	25	100.0	0	0.0	0	0.0
Kamise	Primary	22	88.0	0	0.0	3	12.0	19	76.0	0	0.0	6	24.0

Source: School Survey Data, December/2019 –January/2020

Twenty five students each from boys and girls were also randomly selected and asked whether got diarrhea for the last two weeks before the interview date. The finding (table 62) shows the proportion of girls who got diarrhea is as low as 8.0% in Areda and as high as 100.0% in Aseko and Bolo while their male counterparts (boys) is as low as 12.0% in Areda and as high as 100.0% in Aseko.

Table 60: Whether got diarrhea

Town	Category of School	Girl				Boy			
		Yes		No		Yes		No	
		Girls	%	Girls	%	Boys	%	Boys	%
Aseko	Primary	6	24.0	19	76.0	8	32.0	17	68.0
	Secondary	11	44.0	14	56.0	16	64.0	9	36.0
	Preparatory	23	92.0	2	8.0	21	84.0	4	16.0
	Other	25	100.0	0	0.0	25	100.0	0	0.0
Bolo	Primary	9	36.0	16	64.0	19	76.0	6	24.0
	Secondary	25	100.0	0	0.0	23	92.0	2	8.0
Gonde	Primary	14	56.0	11	44.0	13	52.0	12	48.0
Ude Dhankaka	Primary	35	46.7	40	53.3	12	48,0	13	52.0
	Secondary	4	16.0	21	84.0	9	36.0	16	64.0
Areda	Primary	2	8.0	23	92.0	3	12.0	22	88.0
	Secondary	4	16.0	21	84.0	4	16.0	21	84.0
Biyo	Primary	11	44.0	14	56.0	16	64.0	9	36.0
Kamise	Primary	9	36.0	16	64.0	15	60.0	10	40.0

Source: School Survey Data, December/2019 –January/2020

As part of the survey, it was planned to randomly select twenty consecutive students each from boys and girls and secretly observe whether they wash their hands after toilet. But due to unavailability of hand washing facilities and water, the finding (table 63) shows that it was not possible to observe the hand washing behavior of students after toilet.

Table 61: Whether washed hands after toilet (persons)

Town	Category of School	N/A (no washing facility or no water)	Washed	Not washed
Aseko	Primary	20	N/A	N/A
	Secondary	20	N/A	N/A
	Preparatory	20	N/A	N/A
	Other	20	N/A	N/A
Bolo	Primary	20	N/A	N/A
	Secondary	20	N/A	N/A
Gonde	Primary	20	N/A	N/A

Ude Dhankaka	Primary	60	N/A	N/A
	Secondary	20	N/A	N/A
Areda	Primary	20	N/A	N/A
	Secondary	20	N/A	N/A
Biyo	Primary	20	N/A	N/A
Kamise	Primary	20	N/A	N/A

Source: School Survey Data, December/2019 –January/2020

3.3 Health Survey

3.3.1 Type of Health Facilities Surveyed

In total, four health posts and five health centers were covered by the survey (table 64).

Table 62: Number of health facilities by type of facility

Facility type	Town							Total
	Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Health center	1	1	1	0	1	1	0	5
Health post	1	0	0	1	1	0	1	4
Total	2	1	1	1	2	1	1	9

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.2 Facility Condition and Medical Personnel

3.3.2.1 Water Source

Table 65 presents that among the two health facilities covered by the survey in Aseko, water source is available in one and not available in the other. Health facilities in Bolo, Ude Dhankaka, Aredo (two facilities) and Kamise are without water source while health facilities in Gonde and Biyo have water sources. The water source in Aseko is private connection (table 66) and those in Gonde and Biyo are public taps. All the available facilities are partially operational (with occasional technical downtime, which means water is not available most of the time) (table 67).

Table 63: Availability of water source on the premises of health facilities (number of health facilities)

Facility Type	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Health center	Yes	1	0	1	N/A	0	1	N/A	3
	No	0	1	0	N/A	1	0	N/A	2
Health post	Yes	0	N/A	N/A	0	0	N/A	0	0
	No	1	N/A	N/A	1	1	N/A	1	4
	Total	2	1	1	1	2	1	1	9

Source: Healthy Facility Survey Data, December/2019 –January/2020

Table 64: Type of available water sources on the premises of health facilities (number of health facilities)

Facility Type	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Health center	Public tap (Piped water facility)	0	0	1	N/A	0	1	N/A	2
	Private Connection (Piped water facility)	1	0	0	N/A	0	0	N/A	1
	No, there is no water source on the premise	0	1	0	N/A	1	0	N/A	2
Health post	No, there is no water source on the premise	1	N/A	N/A	1	1	N/A	1	4
Total		2	1	1	1	2	1	1	9

Source: Healthy Facility Survey Data, December/2019 –January/2020

Table 65: Whether the water sources on the health facilities are operational (number of health facilities)

Facility Type	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	

Health center	Partially available/operational (with occasional technical downtime)	1	0	1	N/A	0	1	N/A	3
	Not available/operational at all (currently out of order)	0	1	0	N/A	0	0	N/A	1
	No, there is no water source on the premise	0	0	0	N/A	1	0	N/A	1
Health post	No, there is no water source on the premise	1	N/A	N/A	1	1	N/A	1	4
Total		2	1	1	1	2	1	1	9

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.2.2 Latrine Possession

Regarding latrines, table 68 shows that there is no latrine in Gonde, Ude Dhankaka and Kamise towns' health facilities while the two facilities in Aseko, one facility in Bolo, two facilities in Areda, and one facility in Biyo have latrines. Table 69 further depicts that one latrine in Aseko is ventilated improved pit latrine (VIP) with slab or composing toilet while the other is unimproved latrine such as bucket, pit latrine without slabs or open pit. The latrine in Bolo health facility, the two latrines in Areda health facilities and the one in Biyo are also unimproved latrine such as bucket, pit latrine without slabs or open pits.

Table 66: Whether latrines are available on the premises of health facilities (number of health facilities)

Facility Type	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Health center	Yes	1	1	0	N/A	1	1	N/A	4
	No	0	0	1	N/A	0	0	N/A	1
Health post	Yes	1	N/A	N/A	0	1	N/A	0	2
	No	0	N/A	N/A	1	0	N/A	1	2
Total		2	1	1	1	2	1	1	9

Source: Healthy Facility Survey Data, December/2019 –January/2020

Table 67: Type of latrines in health facilities (number of health facilities)

Facility Type	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Health center	[Improved] Flush toilet to piped sewer systems, septic tanks, pit latrine or equipment that can be treated hygienically	0	0	1	N/A	0	0	N/A	1
	[Improved] The following pit latrine: ventilated improved pit latrines (VIP), pit latrine with slab or composing toilet	1	0	0	N/A	0	0	N/A	1
	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	0	1	0	N/A	1	1	N/A	3
Health post	[Unimproved] latrine such as bucket toilet, pit latrines without slabs or open pit	1	N/A	N/A	0	1	N/A	0	2
	No, there is no latrine on the premise	0	N/A	N/A	1	0	N/A	1	2
Total		2	1	1	1	2	1	1	9

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.2.3 Hand Washing Facilities

Both health facilities in Aseko are without hand washing facility but one has soap (table 70). In the rest of the health facilities, there is no hand washing facility or soap.

Table 68: Whether hand washing facilities are available on the premises of health facilities (number of health facilities)

Facility Type	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Health center	No, there is no hand washing facility or soap	1	1	1	N/A	1	1	N/A	5
Health post	No, there is no hand washing facility there is only soap	1	N/A	N/A	0	0	N/A	0	1
	No, there is no hand washing facility or soap	0	N/A	N/A	1	1	N/A	1	3
Total		2	1	1	1	2	1	1	9

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.2.4 Annual Total Medical Service Fees Received, Total Patients Treated and Medical Personnel

Regarding the annual total medical service fees received and annual total patients treated, table 71 captures the information in this regarding even though there is poor record handling (missing data) in the health facilities. The table further depicts that the service fee per case in 2018 is high (Birr 84.74) in the health center in Gonde compared to the service fee per case in the health center in Bolo (Birr 17.32). The service fees per case in the health centers in same towns reveal similar pattern (Birr 82.17 against Birr 15.01) in 2017.

Table 69: Annual medical service fee (Birr) received and total patients treated

Town	Facility type	2018: Birr	2018: Patients (cases)	2018: Birr/case	2017: Birr	2017: Patients (cases)	2017: Birr/case	2016: Birr	2016: Patients (cases)	2016: Birr/case
Aseko	Health center	225,000.0	3,470	64.84	290,000.0	N/K.	N/K.	N/K.	N/K.	N/K.
	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Bolo	Health center	350,000.0	20,210	17.32	380,000.0	25,310	15.01	400,000.0	28,020	14.28
Gonde	Health center	385,800.0	4,553	84.74	316,000.0	3,841	82.17	275,000.0	3,508	78.39
Ude Dhankaka	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Areda	Health center	N/K.	42,000	N/K.	N/K.	36,000	N/K.	N/K.	32,000	N/K.
	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Biyo	Health center	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Kamise	Health post	N/K	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.

Source: Healthy Facility Survey Data, December/2019 –January/2020

Regarding medical personnel currently engaged at the health facilities, the finding (table 72) reveals that there are no doctors in any of the health facilities. In addition to the absence of medical doctors, there are no nurses at the health post in Aseko, the health post in Ude Dhankaka, the health post in Areda and the health post in Kamise.

Table 70: Number of medical personnel currently engaged at health facilities (persons)

Town	Facility Type	Doctors	Nurses
Aseko	Health center	0	12
	Health post	0	0
Bolo	Health center	0	5

Gonde	Health center	0	12
Ude Dhankaka	Health post	0	0
Areda	Health center	0	5
	Health post	0	0
Biyo	Health center	0	2
Kamise	Health post	0	0

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.2.5 Stock of Medicines and Medical Equipment

Regarding stock of medicines at health facilities, table 73 captures that the health facility in Ude Dhankaka, one health facility in Areda, the health facilities in Biyo and Kamise have sufficient stock of medicines while the two health facilities in Aseko, the one in Biyo, that of Gonde, the other one in Areda are with some medicines lacking. Table 74 reveals that some equipment are lacking in the health facilities in Aseko (one facility), Bolo, Gonde, the two facilities in Areda, the facilities in Biyo and Kamise. Most of the equipment are lacking in the other facility in Aseko and the one in Ude Dhankaka.

Table 71: Whether sufficient stock medicines are available (number of health facilities)

Facility Type		Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Health center	All medicines are sufficient	0	0	0	N/A	1	1	N/A	2
	Some medicines are lacking	1	1	1	N/A	0	0	N/A	3
Health post	All medicines are sufficient	0	N/A	N/A	1	0	N/A	1	2
	Some medicines are lacking	1	N/A	N/A	0	1	N/A	0	2
Total		2	1	1	1	2	1	1	9

Source: Healthy Facility Survey Data, December/2019 –January/2020

Table 72: Whether sufficient stock of medical equipment are available (number of health facilities)

Facility Type	Response	Town							Total
		Aseko	Bolo	Gonde	Ude Dhankaka	Areda	Biyo	Kamise	
Health center	Some equipment are lacking	1	1	1	N/A	1	1	N/A	5
Health post	Some equipment are lacking	0	N/A	N/A	0	1	N/A	1	2
	Most of equipment are lacking	1	N/A	N/A	1	0	N/A	0	2
Total		2	1	1	1	2	1	1	9

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.3 Health Level by Small Town

In order to measure the health level of the seven small towns covered by the survey, the health facilities were requested to provide data on nine issues the findings of which are presented in the following sections.

3.3.3.1 Parturient Mortality

Regarding parturient mortality ratio per 100,000 populations, data on ratio couldn't be found in all health facilities but data on number of mortality cases were collected for some health facilities. Accordingly, table 75 depicts 181 mortality cases in 2018 in the health post in Kamise and 1 case in Ude Dhankaka while data in this respect is missing for 2018, 2017 and 2016 in the health center and health post in Aseko, health post in Bolo, health center in Gonde, health center and health post in Areda and health post in Kamise in 2017 and 2016.

Table 73: Parturient (maternal) mortality cases in the last three years

Town	Facility Type	2018: persons	2018: persons/ 1000 persons	2017: persons	2017: persons/ 1000 persons	2016: persons	2016: persons/ 1000 persons
Aseko	Health center	N/K	N/K	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Bolo	Health center	N/K	N/K	N/K	N/K	N/K	N/K
Gonde	Health center	N/K	N/K	N/K	N/K	N/K	N/K
Ude Dhankaka	Health post	1	N/K	0	N/K	0	N/K
Areda	Health center	N/K	N/K	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Biyo	Health center	0	N/K	0	N/K	0	N/K
Kamise	Health post	181	N/K	N/K	N/K	N/K	N/K

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.3.2 Newborn Infants

Regarding mortality ratio of newborn infant per 1000 population, data on ratio couldn't be found in all health facilities but data on number of newborns were collected for some health facilities. Accordingly, table 76 depicts 181 newborns in 2018 in the health post in Kamise, 2 cases in Ude Dhankaka, 1 case in the health center in Gonde in 2018, 1 case in the health center in Gonde in 2017, 2 cases in the health center in Gonde in 2016, while data in this respect is missing for 2018, 2017 and 2016 in the health center and health post in Aseko, health post in Bolo, health center and health post in Areda and health post in Kamise in 2017 and 2016.

Table 74: Mortality ratio of newborns in the last three years

Town	Facility Type	2018: persons	2018: persons/ 1000 persons	2017: persons	2017: persons/ 1000 persons	2016: persons	2016: persons/ 1000 persons
Aseko	Health center	N/K	N/K	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Bolo	Health center	N/K	N/K	N/K	N/K	N/K	N/K
Gonde	Health center	1	N/K	1	N/K	2	N/K
Ude Dhankaka	Health post	2	N/K	0	N/K	0	N/K
Areda	Health center	N/K	N/K	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Biyo	Health center	0	N/K	0	N/K	0	N/K
Kamise	Health post	181	N/K	N/K	N/K	N/K	N/K

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.3.3 Mortality of Children under 5 Years Old

Regarding mortality ratio of children under 5 years per 1000 population, data on ratio couldn't be found in all health facilities but data on number of mortality cases of children under 5 years old were collected for some health facilities. Accordingly, table 77 depicts 781 mortality cases of children under 5 years old in 2018 in the health post in Kamise, 1 case each in 2018 and 2016 in the health post in Ude Dhankaka, while data in this regard is missing for 2018, 2017 and 2016 in the health center and health post in Aseko, health post in Bolo, health center and health post in Areda.

Table 75: Mortality cases of children under 5 years old in the last three years

Town	Facility Type	2018: persons	2018: persons/ 1000 persons	2017: persons	2017: persons/ 1000 persons	2016: persons	2016: persons/1000 persons
Aseko	Health center	N/K	N/K	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Bolo	Health center	N/K	N/K	N/K	N/K	N/K	N/K
Gonde	Health center	0	N/K	0	N/K	0	N/K
Ude Dhankaka	Health post	1	N/K	0	N/K	1	N/K
Areda	Health center	N/K	N/K	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Biyo	Health center	0	N/K	0	N/K	0	N/K
Kamise	Health post	781	N/K	N/K	N/K	N/K	N/K

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.3.4 Number of Newly Infected Persons with HIV

Regarding number of persons newly infected with HIV per 1000 uninfected persons, data on ratio was collected only from the health center in Aseko in 2018 (table 78). Table 78 further depicts 1 case, 10 cases and 6 cases in the health center in Gonde in 2018, 2017 and 2016, respectively; 3 cases, 2 cases and another 2 cases in the health post in Ude Dhankaka in 2018, 2017 and 2016, respectively; 44 cases and 11 cases in the health center in Biyo in 2018 and 2017, respectively; while data in this regard is missing in the other health facilities in reference.

Table 76: Number of persons newly infected with HIV in the last three years

Town	Facility Type	2018: Total persons	2018: persons/1000 uninfected persons	2017: Total persons	2017: persons/1000 uninfected persons	2016: Total persons	2016: persons/1000 uninfected persons
Aseko	Health center	N/K.	0.003	N/K.	N/K.	N/K.	N/K.
	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Bolo	Health center	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Gonde	Health center	1	N/K.	10	N/K.	6	N/K.
Ude Dhankaka	Health post	3	N/K.	2	N/K.	2	N/K.
Areda	Health center	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Biyo	Health center	44	N/K.	11	N/K.	N/K.	N/K.
Kamise	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.3.5 Number of Newly Infected Persons with Malaria

Regarding number of persons infected with malaria per 1000 population, data on ratio were found only in few health facilities. As captured by table 79, the number of persons infected with malaria was as large as 625 in 2018 and 172 in 2017 in the health center in Biyo, and 173 in the health post in Aseko in 2018, while data in this regard is missing in the majority of the health facilities in reference.

Table 77: Number of persons infected with malaria in the last three years

Town	Facility Type	2018: Total persons	2018: persons/1000 persons	2017: Total persons	2017: persons/1000 persons	2016: Total persons	2016: persons/1000 persons
Aseko	Health center	75	0.075	N/K.	N/K.	57	0.057
	Health post	173	N/K.	N/K.	N/K.	N/K.	N/K.
Bolo	Health center	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Gonde	Health center	1	N/K.	1	N/K.	15	N/K.
Ude Dhankaka	Health post	14	N/K.	28	N/K.	16	N/K.
Areda	Health center	0	N/K.	0	N/K.	0	N/K.
	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Biyo	Health center	625	N/K.	172	N/K.	N/K.	N/K.
Kamise	Health post	27	N/K.	N/K..	N/K.	N/K.	N/K.

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.3.6 Number of Children under 5 Years Infected with Water Borne Diseases

Regarding number of children under 5 years old infected with water borne diseases, data on persons per 1000 persons was only found in the health center in Aseko in 2018 and missing for all the remaining health facilities (table 80). Table 80 further reveals large cases of infections with water borne diseases as big as 2140 cases in the health center in Gonde in 2016, 1538 cases in the health center in Biyo in 2018 and 1527 infections in the health center in Gonde in 2017.

Table 78: Number of children under 5 years old infected with water borne diseases in the last three years

Town	Facility Type	2018: Total persons	2018: persons/1 000 persons	2017: Total persons	2017: persons/1 000 persons	2016: Total persons	2016: persons/1000 persons
Aseko	Health center	912	0.912	N/K.	N/K.	N/K.	N/K.
	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Bolo	Health center	560	N/K.	530	N/K.	480	N/K.
Gonde	Health center	812	N/K.	1527	N/K.	2140	N/K.
Ude Dhankaka	Health post	30	N/K.	36	N/K.	42	N/K.
Areda	Health center	254	N/K.	N/K.	N/K.	385	N/K.
	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Biyo	Health center	1538	N/K.	553	N/K.	N/K.	N/K.
Kamise	Health post	71	N/K.	N/K.	N/K.	N/K.	N/K.

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.3.7 Number of Men Infected with Water Borne Diseases

Regarding number of men infected with water borne diseases, table 81 reveals large cases of such infections up to as big as 1627 cases in 2016 and 1212 cases in 2017 in the health center in Gonde in 2016. Data in this regard is missing in most of the health facilities.

Table 79: Number of men infected with water borne diseases in the last three years

Town	Facility Type	2018: Total Men	2018: Men/1000 Men	2017: Total Men	2017: Men/1000 Men	2016: Total Men	2016: Men/1000 Men
Aseko	Health center	236	0.23	N/K.	N/K.	N/K.	N/K.
	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Bolo	Health center	380	N/K.	275	N/K.	230	N/K.
Gonde	Health center	816	N/K.	1212	N/K.	1627	N/K.
Ude Dhankaka	Health post	22	N/K.	20	N/K.	36	N/K.
Areda	Health center	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
	Health post	N/K.	N/K.	N/K.	N/K.	N/K.	N/K.
Biyo	Health center	4	N/K.	N/K.	N/K.	N/K.	N/K.
Kamise	Health post	22	N/K.	N/K.	N/K.	N/K.	N/K.

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.3.8 Number of Women Infected with Water Borne Diseases

Regarding number of women infected with water borne diseases, table 82 reveals large cases of such infections up to as big as 2116, 1213 and 1013 cases in 2017, 2016 and 2018, respectively in the health center in Gonde. Data in this regard is missing in most of the health facilities.

Table 80: Number of women infected with water borne diseases in the last three years

Town	Facility Type	2018: Total Women	2018: Women/ 1000 Women	2017: Total Women	2017: Women/ 1000 Women	2016: Total Women	2016: Women/ 1000 Women
Aseko	Health center	196	0.02	36	0.036	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Bolo	Health center	180	N/K	128	N/K	250	N/K
Gonde	Health center	1013	N/K	2116	N/K	1213	N/K
Ude Dhankaka	Health post	29	N/K	26	N/K	36	N/K
Areda	Health center	N/K	N/K	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Biyo	Health center	7	N/K	N/K	N/K	N/K	N/K
Kamise	Health post	29	N/K	N/K	N/K	N/K	N/K

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.3.9 Number of Health Extension Workers Currently Deployed

Regarding number of health extension workers currently deployed, table 83 reveals that there are health facilities without health extension workers like the health center in Bolo. The health center in Gonde is in better condition in this regard (12 HEWs).

Table 81: Number of health extension workers (HEWs) currently deployed

Town	Facility Type	Number of health extension workers (HEWs) currently deployed in the entire small town
Aseko	Health center	2
	Health post	2
Bolo	Health center	0
Gonde	Health center	12
Ude Dhankaka	Health post	3
Areda	Health center	N/K
	Health post	1
Biyo	Health center	N/K
Kamise	Health post	2

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.4 Nutrition Level by Small Town

In order to measure the nutrition level of the seven small towns covered by the survey, the health facilities were requested to provide data on stunted, wasted and underweight children under 5 years old for the years 2016 to 2018. Survey findings in this regard are presented in the following sections.

3.3.4.1 Number of Stunted Children

Regarding ratio of stunted children under 5 years old, even though data in this regard is missing in majority of the health facilities, table 84 shows that relatively large number of stunted children (1400 children) were registered in the health center in Aseko in 2017 and relatively less number of stunted children (359 children) in the same health center in 2018. Similar pattern is observed for the health center in Biyo (278 and 259 stunted children in 2017 and 2018, respectively).

Table 82: Number of stunted children under 5 years old in the last three years

Town	Facility Type	2018: %	2018: Children	2017: %	2017: Children	2016: %	2016: Children
Aseko	Health center	N/K	359	N/K	1400	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Bolo	Health center	3.00	N/K.	5.00	N/K.	5.00	N/K
Gonde	Health center	N/K	N/K	N/K	N/K	N/K	N/K
Ude Dhankaka	Health post	7.00	N/K	6.00	N/K	4.00	N/K
Areda	Health center	4.00	N/K	5.00	N/K	4.00	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Biyo	Health center	N/K	259	N/K	278	N/K	N/K
Kamise	Health post	N/K	7	N/K	N/K	N/K	N/K

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.4.2 Number of Wasted Children

Regarding ratio of wasted children under 5 years old, even though data in this regard is also missing in majority of the health facilities, table 85 shows lower percentages of wasted children in the health facilities for which data is provided.

Table 83: Number of wasted children under 5 years old in the last three years

Town	Facility Type	2018: %	2018: Children	2017: %	2017: Children	2016: %	2016: Children
Aseko	Health center	N/K	N/K	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Bolo	Health center	3.00	N/K	5.00	N/K	5.00	N/K
Gonde	Health center	N/K	N/K	N/K	N/K	N/K	N/K
Ude Dhankaka	Health post	3.00	N/K	2.00	N/K	1.00	N/K
Areda	Health center	N/K	N/K	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Biyo	Health center	N/K	39	N/K	57	N/K	N/K
Kamise	Health post	N/K	N/K	N/K	N/K	N/K	N/K

Source: Healthy Facility Survey Data, December/2019 –January/2020

3.3.4.3 Number of Underweight Children

Regarding ratio of underweight children under 5 years old, even though data in this regard is also missing in majority of the health facilities, table 86 shows large number of underweight children (1236 underweight children) in the health center in Aseko in 2018. There were also 278 and 259 underweight children in Biyo in 2017 and 2018, respectively. The ratio of underweight children in the other health facilities for which data is provided varies from as low as 3% in the health center in Bolo in 2018 and health post in Ude Dhankaka in 2016 to as big as 8% in the health post in Ude Dhankaka in 2018.

Table 84: Number of the underweight children under 5 years old in last three years

Town	Facility Type	2018: %	2018: Number of underweight children	2017: %	2017: Number of underweight children	2016: %	2016: Number of underweight children
Aseko	Health center	N/K	1236	N/K	N/K	N/K	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Bolo	Health center	3.00	N/K	5.00	N/K	5.00	N/K
Gonde	Health center	N/K	N/K	N/K	N/K	N/K	N/K
Ude Dhankaka	Health post	8.00	N/K	4.00	N/K	3.00	N/K
Areda	Health center	4.00	N/K	5.00	N/K	4.00	N/K
	Health post	N/K	N/K	N/K	N/K	N/K	N/K
Biyo	Health center	N/K	259	N/K	278	N/K	N/K
Kamise	Health post	N/K	N/K	N/K	N/K	N/K	N/K

Source: Healthy Facility Survey Data, December/2019 –January/2020

7(8) 環境社会配慮 EIA 証明書

資料 7(8) 環境社会配慮 EIA 証明書

1. Ude Dhankaka (ES-6)

Bulchiinsa Mootummaa Naannoo Oromiyaatti Abbaa Taayitaa
Eegumsa Naannoo, Bosonaa fi Jijjiirama Qilleensaa
በኦሮሚያ ክልላዊ መንግሥት መስተዳደር የአካባቢ ፣ደንና የአየር ንብረት ለዉጥ ባለሥልጣን
The Regional Government of Oromia Environment, Forest and Climate Change Authority
FINFINNEE/አዲስ አበባ/ADDIS ABABA

Lakk./ቁጥር/Ref. NATENBJQ/254/259
Guyyaa/ቀን/Date 28/12/13

To: Oromia Water & Energy Resource Development Bureau
Finfinne

Subject: Approval of Environmental & Social Impact Assessment for Ude Dhankaka Town Water Supply project.

The Environment, Forest and Climate Change Authority (EFCCA) of the Oromia National Regional State has evaluated the environmental Impact Assessment report of **Water Supply project,** in accordance with the **'EIA' Proclamation No 299/2002** of Federal Ministry of Environment, Forest and Climate Change and EIA Proclamation **No. 176/2012** of Oromia Regional State and the relevant guidelines. The evaluation has disclosed that the report is prepared on the basis of a life-cycle approach and that:

- Measures taken to ensure effective and meaningful consultation are sufficient,
- Methods and instruments used to collect and prepare baseline information are adequate,
- Methods and objectivity of criteria to identify or predict impacts are appropriate,
- The impact analysis and means of containment envisaged under the report are all-inclusive.

The proposed project is to be located in **Oromia Regional State, East Shoa Zone, Ada Woreda, Ude Dhankaka Town.**

Therefore, the Oromia EFCCA, after evaluating the impact study report, has approved the implementation of the proposed project on the basis of the following preconditions:

- The Oromia EFCCA, will monitor implementation of the project in order to evaluate compliance with all the particulars mentioned under the EMP and ensure the taking of measures by the proponent to undertake any corrective measures as deemed appropriate;
- The OEFCCA will require the proponent to address any unforeseen fact of serious implication that is realized after the issuance.

With Regards,

Sintayehu Befekadu Gossa
Environmental Law Enforcement Monitoring & Control Directorate Director

C.C.

- Oromia Land Administration and Use Bureau
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2. Kamise (ES-8)

Bulchiinsa Mootummaa Naannoo Oromiyaatti Abbaa Taayitaa
Eegumsa Naannoo, Bosonaa fi Jijjiirama Qilleensaa
በኦሮሚያ ክልላዊ መንግሥት መስተዳደር የአካባቢ ፣ደንና የአየር ንብረት ለዉጥ ባለሥልጣን
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Lakk./ቁጥር/Ref. No ATCN 5T0/254/2592
Guyyaa/ቀን/Date 18/1/13

To: Oromia Water & Energy Resource Development Bureau
Finfinne

Subject: Approval of Environmental & Social Impact Assessment for Kamise Town Water Supply project.

The Environment, Forest and Climate Change Authority (EFCCA) of the Oromia National Regional State has evaluated the environmental Impact Assessment report of **Water Supply project,** in accordance with the **'EIA' Proclamation No 299/2002** of Federal Ministry of Environment, Forest and Climate Change and EIA Proclamation **No. 176/2012** of Oromia Regional State and the relevant guidelines. The evaluation has disclosed that the report is prepared on the basis of a life-cycle approach and that:

- Measures taken to ensure effective and meaningful consultation are sufficient,
- Methods and instruments used to collect and prepare baseline information are adequate,
- Methods and objectivity of criteria to identify or predict impacts are appropriate,
- The impact analysis and means of containment envisaged under the report are all-inclusive.

The proposed project is to be located in **Oromia Regional State, East Shoa Zone, Lume Woreda, Kamise Town.**

Therefore, the Oromia EFCCA, after evaluating the impact study report, has approved the implementation of the proposed project on the basis of the following preconditions:

- The Oromia EFCCA, will monitor implementation of the project in order to evaluate compliance with all the particulars mentioned under the EMP and ensure the taking of measures by the proponent to undertake any corrective measures as deemed appropriate;
- The OEFCCA will require the proponent to address any unforeseen fact of serious implication that is realized after the issuance.

With Regards,

Sintayehu Befekadu Gossa
Environmental Law Enforcement Monitoring & Control Directorate Director

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please quote our Ref. No. while replying.

3. Areda (ES-10)

Bulchiinsa Mootummaa Naannoo Oromiyaatti Abbaa Taayitaa
Eegumsa Naannoo, Bosonaa fi Jijjiirama Qilleensaa
በኦሮሚያ ክልላዊ መንግሥት መስተዳደር የአካባቢ ፣ደንና የአየር ንብረት ለዉጥ ባለሥልጣን
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Lakk./ቁጥር/Ref. No ATENBJQ/25-4/259
Guyyaa/ቀን/Date 18/12/13

To: Oromia Water & Energy Resource Development Bureau
Finfinne

Subject: Approval of Environmental & Social Impact Assessment for Areda Town Water Supply project.

The Environment, Forest and Climate Change Authority (EFCCA) of the Oromia National Regional State has evaluated the environmental Impact Assessment report of **Water Supply project,** in accordance with the **'EIA' Proclamation No 299/2002** of Federal Ministry of Environment, Forest and Climate Change and EIA Proclamation **No. 176/2012** of Oromia Regional State and the relevant guidelines. The evaluation has disclosed that the report is prepared on the basis of a life-cycle approach and that:

- Measures taken to ensure effective and meaningful consultation are sufficient,
- Methods and instruments used to collect and prepare baseline information are adequate,
- Methods and objectivity of criteria to identify or predict impacts are appropriate,
- The impact analysis and means of containment envisaged under the report are all-inclusive.

The proposed project is to be located in **Oromia Regional State, East Shoa Zone,Gimbichu Woreda, Areda Town.**

Therefore, the Oromia EFCCA, after evaluating the impact study report, has approved the implementation of the proposed project on the basis of the following preconditions:

- The Oromia EFCCA, will monitor implementation of the project in order to evaluate compliance with all the particulars mentioned under the EMP and ensure the taking of measures by the proponent to undertake any corrective measures as deemed appropriate;
- The OEFCCA will require the proponent to address any unforeseen fact of serious implication that is realized after the issuance.

With Regards,

Sintayehu Befekadu Gossa
Environmental Law Enforcement Monitoring & Control Directorate Director

C.C.

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4. Biyo (ES-11)

Bulchiinsa Mootummaa Naannoo Oromiyaatti Abbaa Taayitaa
Eegumsa Naannoo, Bosonaa fi Jijjiirama Qilleensaa
በኦሮሚያ ክልላዊ መንግሥት መስተዳደር የአካባቢ ፣ደንና የአየር ንብረት ለዉጥ ባለሥልጣን
The Regional Government of Oromia Environment, Forest and Climate Change Authority
FINFINNEE/አዲስ አበባ/ADDIS ABABA

Lakk./ቁጥር/Ref. No ATENBJQ/25-3/259
Guyyaa/ቀን/Date 18/6/13

To: Oromia Water & Energy Resource Development Bureau
Finfinne

Subject: Approval of Environmental & Social Impact Assessment for Biyo Town Water Supply project.

The Environment, Forest and Climate Change Authority (EFCCA) of the Oromia National Regional State has evaluated the environmental Impact Assessment report of **Water Supply project,** in accordance with the **'EIA' Proclamation No 299/2002** of Federal Ministry of Environment, Forest and Climate Change and EIA Proclamation **No. 176/2012** of Oromia Regional State and the relevant guidelines. The evaluation has disclosed that the report is prepared on the basis of a life-cycle approach and that:

- Measures taken to ensure effective and meaningful consultation are sufficient,
- Methods and instruments used to collect and prepare baseline information are adequate,
- Methods and objectivity of criteria to identify or predict impacts are appropriate,
- The impact analysis and means of containment envisaged under the report are all-inclusive.

The proposed project is to be located in **Oromia Regional State, East Shoa Zone, Lume Woreda, Biyo Town.**

Therefore, the Oromia EFCCA, after evaluating the impact study report, has approved the implementation of the proposed project on the basis of the following preconditions:

- The Oromia EFCCA, will monitor implementation of the project in order to evaluate compliance with all the particulars mentioned under the EMP and ensure the taking of measures by the proponent to undertake any corrective measures as deemed appropriate;
- The OEFCCA will require the proponent to address any unforeseen fact of serious implication that is realized after the issuance.

With Regards,

Sintayehu Befekadu Gossa
Environmental Law Enforcement Monitoring & Control Directorate Director

C.C.

- Oromia Land Administration and Use Bureau
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please quote our Ref. No. while replying.

5. Bolo (AR-2)

Bulchiinsa Mootummaa Naannoo Oromiyaatti Abbaa Taayitaa
Eegumsa Naannoo, Bosonaa fi Jijjiirama Qilleensaa
በኦሮሚያ ክልላዊ መንግሥት መስተዳደር የአካባቢ ፣ደንና የአየር ንብረት ለዉጥ ባለሥልጣን
The Regional Government of Oromia Environment, Forest and Climate Change Authority
FINFINNEE/አዲስ አበባ/ADDIS ABABA

Lakk./ቁጥር/Ref. No AIRIB ID/25 ±/25 ?
Guyyaa/ቀን/Date 18/1/13

To: Oromia Water & Energy Resource Development Bureau
Finfinne

Subject: Approval of Environmental & Social Impact Assessment for Bolo Town Water Supply project.

The Environment, Forest and Climate Change Authority (EFCCA) of the Oromia National Regional State has evaluated the environmental Impact Assessment report of **Water Supply project,** in accordance with the **'EIA' Proclamation No 299/2002** of Federal Ministry of Environment, Forest and Climate Change and EIA Proclamation **No. 176/2012** of Oromia Regional State and the relevant guidelines. The evaluation has disclosed that the report is prepared on the basis of a life-cycle approach and that:

- Measures taken to ensure effective and meaningful consultation are sufficient,
- Methods and instruments used to collect and prepare baseline information are adequate,
- Methods and objectivity of criteria to identify or predict impacts are appropriate,
- The impact analysis and means of containment envisaged under the report are all-inclusive.

The proposed project is to be located in Oromia Regional State, Arsi Zone, JejuWoreda, BoloTown.

Therefore, the Oromia EFCCA, after evaluating the impact study report, has approved the implementation of the proposed project on the basis of the following preconditions:

- The Oromia EFCCA, will monitor implementation of the project in order to evaluate compliance with all the particulars mentioned under the EMP and ensure the taking of measures by the proponent to undertake any corrective measures as deemed appropriate;
- The OEFCCA will require the proponent to address any unforeseen fact of serious implication that is realized after the issuance.

With Regards,

Sintayehu Befekadu Gossa
Environmental Law Enforcement Monitoring & Control Directorate Director

C.C.

- Oromia Land Administration and Use Bureau
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please quote our Ref. No. while replying.

6. Aseko (AR-4)

Bulchiinsa Mootummaa Naannoo Oromiyaatti Abbaa Taayitaa
Eegumsa Naannoo, Bosonaa fi Jijjiirama Qilleensaa
በኦሮሚያ ክልላዊ መንግሥት መስተዳደር የአካባቢ ፣ደንና የአየር ንብረት ለዉጥ ባለሥልጣን
The Regional Government of Oromia Environment, Forest and Climate Change Authority
FINFINNEE/አዲስ አበባ/ADDIS ABABA

Lakk./ቁጥር/Ref. No ATENBJQ/25-8/259
Guyyaa/ቀን/Date 18/1/13

To: Oromia Water & Energy Resource Development Bureau
Finfinne

Subject: Approval of Environmental & Social Impact Assessment for Aseko Town Water Supply project.

The Environment, Forest and Climate Change Authority (EFCCA) of the Oromia National Regional State has evaluated the environmental Impact Assessment report of **Water Supply project,** in accordance with the **'EIA' Proclamation No 299/2002** of Federal Ministry of Environment, Forest and Climate Change and EIA Proclamation **No. 176/2012** of Oromia Regional State and the relevant guidelines. The evaluation has disclosed that the report is prepared on the basis of a life-cycle approach and that:

- Measures taken to ensure effective and meaningful consultation are sufficient,
- Methods and instruments used to collect and prepare baseline information are adequate,
- Methods and objectivity of criteria to identify or predict impacts are appropriate,
- The impact analysis and means of containment envisaged under the report are all-inclusive.

The proposed project is to be located in Oromia Regional State, Arsi Zone, AsekoWoreda, Aseko Town.

Therefore, the Oromia EFCCA, after evaluating the impact study report, has approved the implementation of the proposed project on the basis of the following preconditions:

- The Oromia EFCCA, will monitor implementation of the project in order to evaluate compliance with all the particulars mentioned under the EMP and ensure the taking of measures by the proponent to undertake any corrective measures as deemed appropriate;
- The OEFCCA will require the proponent to address any unforeseen fact of serious implication that is realized after the issuance.

With Regards,

Shuraburhe Haldu Wossa
Enforcement Monitoring & Control Directorate Director

C.C.

- Oromia Land Administration and Use Bureau-
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7. Gonde (AR-6)

Bulchiinsa Mootummaa Naannoo Oromiyaatti Abbaa Taayitaa
Eegumsa Naannoo, Bosonaa fi Jijjiirama Qilleensaa
በኦሮሚያ ክልላዊ መንግሥት መስተዳደር የአካባቢ ፣ደንና የአየር ንብረት ለዉጥ ባለሥልጣን
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Lakk./ቁጥር/Ref. No AEC NBID/RT 4/2592
Guyyaa/ቀን/Date 15/4/13

To: Oromia Water & Energy Resource Development Bureau
Finfinne

Subject: Approval of Environmental & Social Impact Assessment for Gonde Town Water Supply project.

The Environment, Forest and Climate Change Authority (EFCCA) of the Oromia National Regional State has evaluated the environmental Impact Assessment report of **Water Supply project,** in accordance with the **'EIA' Proclamation No 299/2002** of Federal Ministry of Environment, Forest and Climate Change and EIA Proclamation **No. 176/2012** of Oromia Regional State and the relevant guidelines. The evaluation has disclosed that the report is prepared on the basis of a life-cycle approach and that:

- Measures taken to ensure effective and meaningful consultation are sufficient,
- Methods and instruments used to collect and prepare baseline information are adequate,
- Methods and objectivity of criteria to identify or predict impacts are appropriate,
- The impact analysis and means of containment envisaged under the report are all-inclusive.

The proposed project is to be located in **Oromia Regional State, Arsi Zone, TiyoWoreda, Gonde Town.**

Therefore, the Oromia EFCCA, after evaluating the impact study report, has approved the implementation of the proposed project on the basis of the following preconditions:

- The Oromia EFCCA, will monitor implementation of the project in order to evaluate compliance with all the particulars mentioned under the EMP and ensure the taking of measures by the proponent to undertake any corrective measures as deemed appropriate;
- The OEFCCA will require the proponent to address any unforeseen fact of serious implication that is realized after the issuance.

With Regards,

Sintayehu Refekadu Gossa
Environmental Law Enforcement Monitoring & Control Directorate Director

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please quote our Ref. No. while replying.

7(9) 地下水涵養量について

資料 7(9) 地下水涵養量について

検討 1: オロミア州の気候リスクデータや報告書に基づき、深井戸の掘削から配水にあたっても、現在の乾季の水量のみならず、今後中長期的に減少すると想定される水量を基に管路系給水システムの設計、整備を検討していただく必要があります。そうでないと、増加する需要を満たすため、供給を多くすると長期に渡って持続的な給水が行えなくなる可能性があります。

＜検討結果＞

(1)Ude Dhankaka サイトの既存灌漑井戸との相互干渉を考慮した水位予測

協力対象 6 タウン中 Ude Dhankaka タウンには、本事業による井戸建設予定地の周辺に既存の灌漑井戸（建設予定地から約 750m の位置）があることから、相互干渉の検討を行った。計算条件として、本事業の井戸が試掘井の最大揚水量の 70%である 7 L/s、灌漑井戸が現行の 62 L/s で汲み上げた場合の地下水低下量を算定した。

その結果、50 年後の長期予測として、本事業で建設予定の井戸を上記の揚水量でくみ上げた場合、既存の灌漑井戸は約 7m 程度、また、既存の井戸を上記の現行揚水量でくみ上げた場合、建設予定の井戸は、現在の水位もよりも 8m 程度低下する可能性があることがわかった。ただし、この計算では、最大揚水量の値は一定で、変更ないものと仮定している。

(2)既往調査による地下水涵養量と 2035 年の各流域の水需要予測量との比較

本準備調査に先立つ、先行開発調査｛JICA（2015）、アワッシュ川中流域地下水開発計画プロジェクト｝では、アワシュ流域を 13 の小流域に区分し、過去 60 年以上の日降水量のデータから、直近 30 年（1983 年～2012 年）のデータを解析して、年間地下水涵養量と 2035 年の各流域の水需要量（揚水量）との比較を実施している。

その結果、Ude Dhankaka, Kamise, Biyo, Areda を含む小流域で揚水量が涵養量に対して 37%、Bolo, (Gonde）を含む小流域では 2%程度の揚水量となり、地下水供給量に問題ないとの結論が得られている（下記の Box 参照)。ただし、この計算シナリオでは、2011 年までの 60 年間の年間降水量のトレンド分析をもとに、2035 年まで降水量の変動も小さいものとの仮定で算出している。

検討結果の要約の抜粋について付属資料 1 に示す。

Box：調査対象7小都市の地下水涵養量に対する揚水流量の比率（Y/GWR）（2035年の推定値）：

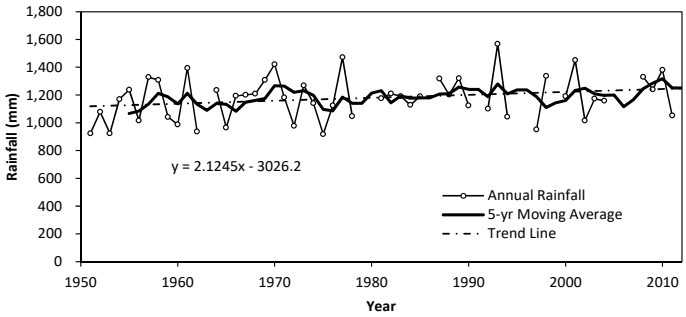
- SB2-L 流域（**Ude Dhankaka、Kamise、Biyo タウン**）： Y/GWR：37.4%
- SB3-R 流域（**Bolo、Gonde タウン**）： Y/GWR：1.8%
- SB5-L 流域（**Areda タウン**）： Y/GWR：0.5%

出典：JICA（2015）、アワッシュ川中流域地下水開発計画プロジェクト報告書より

付属資料 1:先行開発調査{JICA(2015)、アワッシュ川中流域地下水開発計画プロジェクト(以下、MP:マスタープラン)}で実施された地下水涵養量の算出に関連した資料からの抜粋

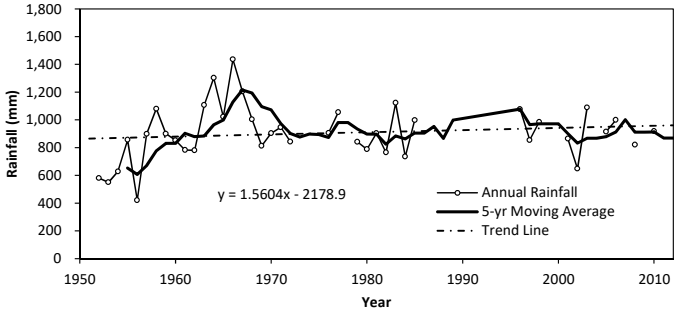
1. 過去 60 年（1850 年～2010 年）までの気候の長期変動の状況

アディスアベバと Debre Zeit および Kulumsa 観測所における年間降水量の長期トレンドを図 1～図 3 に示す。



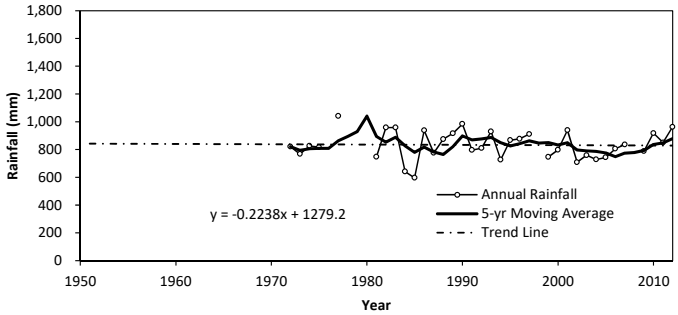
出典：MP（マスタープラン）調査団、データ元：NMA の日雨量データ

図 1: アディスアベバにおける年降水量のトレンド（1951－2011）



出典：MP 調査団、データ元：NMA の日雨量データ

図 2: Debre Zeit における年降水量のトレンド（1952－2011）



出典：MP 調査団、データ元：NMA の日雨量データ

図 3: Kulumsa における年降水量のトレンド（1972－2012）

上に示したグラフは、それぞれの観測所において、欠測のない年の年間降水量とその 5 年移動平均、および近似直線を示している。近似直線によると、アディスアベバと Debre Zeit においてはわずかな上昇トレンドが見受けられる一方、Kulumsa ではわずかな下降トレンドが見られる。すなわち、アワシュ川中流域において何らかの明確な年間降水量の変化トレンドを見出すことはできない。

2. アワシュ川中流域の地下水涵養量

2.1 はじめに

アワシュ川中流域の地下水涵養量は、降水量と河川への流出率および基底流量係数を用いて求めた。地下水涵養量は、地下水の利用可能な基本値となるが、地下水ポテンシャルは、現状の地下水涵養量と地下水利用量を比較しても、今後地下水が十分に利用できる程度に高いと思われる。ただし供給量が十分存在しているとしても、どの程度地下水が確保できるかを知るために帯水層のポテンシャル評価を行う必要がある。そのため帯水層ごとの地下水利用の生産性の評価が、帯水層の揚水試験から求めた揚水流量や比湧出量等の値を用いて行われた。

2.2 地下水涵養量と揚水流量

アワシュ川中流域は、13 の小流域に区分され、それぞれの流域での年間平均降水量と流出率を求め、それに BFI（Base Flow Index）を乗じて基底流量（地下水涵養量）を求めた（表 1 参照）。各小流域の流域区分と年間平均地下水涵養量（m^3/year）及び対象とした小都市と代表的な既存井戸地点を図 4 に示した。

表 1: 小流域ごとの地下水涵養量

番号	小流域	流域面積 (A) [km^2]	年降水量 (R) [mm/yr]	流出率 (C) [-]	Base Flow Index (BFI) [-]	年間地下水涵養量 (GWR)		GWR/R [%]
						[mm/yr]	[10^6 m^3/yr]	
1	SB1-L	2,068	1,097	0.18	0.44	87.2	180.3	7.9%
2	SB1-R	2,508	1,075	0.17	0.46	84.4	211.6	7.8%
3	SB2-L	4,860	982	0.15	0.51	73.7	358.4	7.5%
4	SB2-R	1,859	867	0.18	0.43	69.4	129.0	8.0%
5	SB3-L	508	853	0.25	0.35	74.4	37.8	8.7%
6	SB3-R	2,743	832	0.17	0.46	64.9	178.1	7.8%
7	SB4-L-U	435	824	0.26	0.34	72.5	31.6	8.8%
8	SB4-L-D	312	548	0.28	0.32	49.3	15.4	9.0%
9	SB4-R	3,367	806	0.16	0.48	62.0	208.8	7.7%
10	SB5-L	5,710	779	0.14	0.53	57.9	330.8	7.4%
11	SB5-R	2,347	870	0.17	0.45	68.6	161.0	7.9%
12	SB-BSK-W	2,041	740	0.18	0.44	58.9	120.2	8.0%
13	SB-BSK	532	548	0.25	0.35	47.6	25.3	8.7%
All Basin		29,290	876	-	-	67.9	1,988.3	7.7%

出典：MP 調査団、データ元：参考資料 ④

各小流域での地下水利用量に関しては、小流域内の主要な中大都市の揚水流量データ（2035 年の予測）と 2035 年での対象小都市の計画揚水流量（計画需要量のうち計画日最大給水量で 50 L/人/日の給水原単位を想定した場合）を合計して地下水涵養量との比較を行った。主要都市は、アディスアベバ、Bishoftu（旧：Debre Zeyt）、Mojo、Adama（旧：Nazret）、Huruta、Itaya、Welenchiti、Dera、Awash Melkasa、Abomsa、Metehara 及び Awash である。このうち、Adama、Metehara 及び Awash は表流水を、また Hurta、Itaya、Welenchiti、Dera 及び Awash Melkasa は湧水を使用しているため揚水流量の値からは除外している。

また代表的な既存井戸をそのまま 2035 年まで使用すると仮定し、揚水流量は近接する小都市の増加率（2015 年の約 2.23 倍）をかけて 2035 年での使用量を推定した（表 2 参照）。

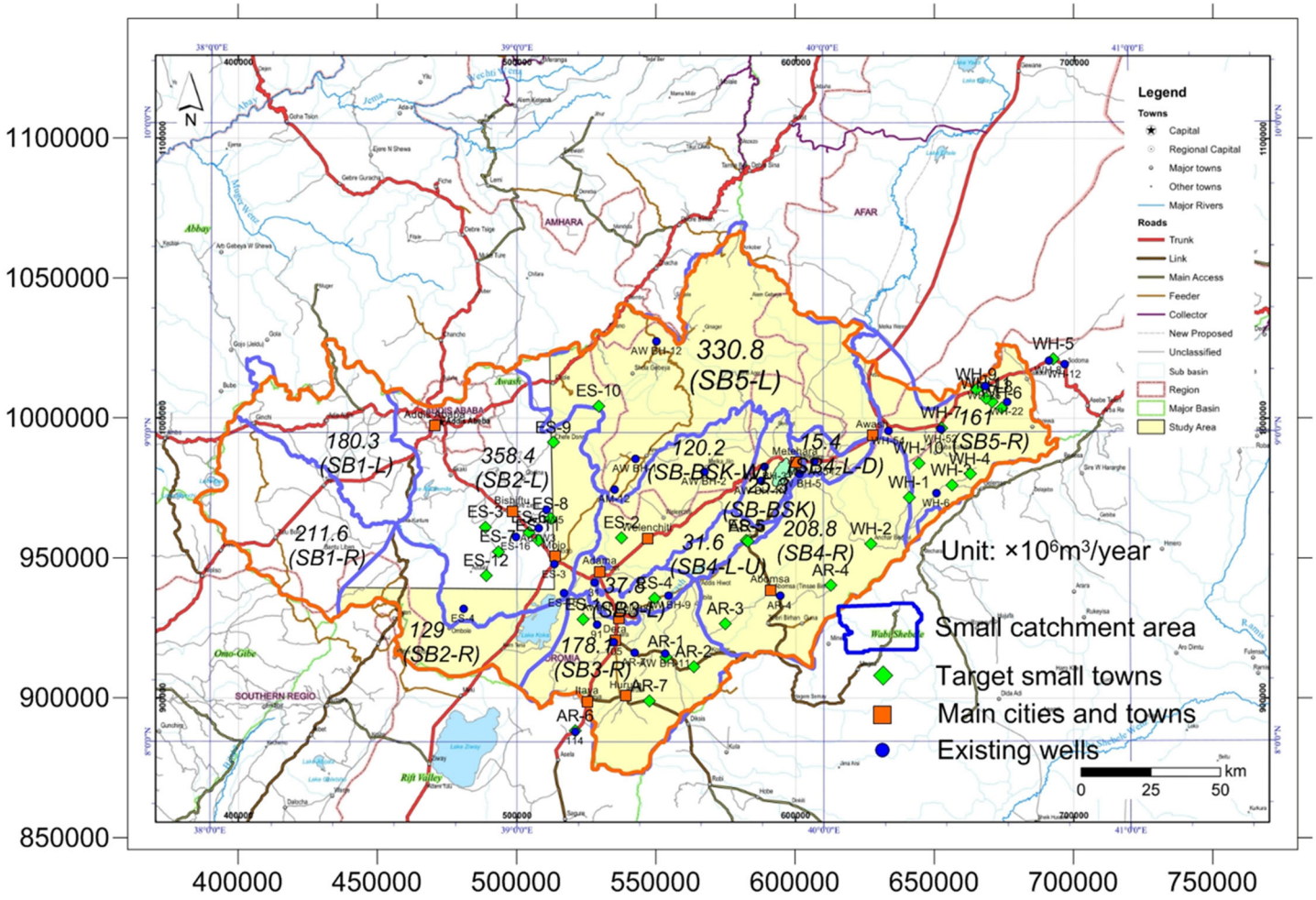
算出結果を要約すると下記のとおりとなる。

- 地下水涵養量に対する揚水流量の比率は、表2に示したように、データを得た大部分の小流域で、1～5%程度であり、揚水流量の量的な確保は十分可能であることがわかる。
- 小流域のうちSB2-Lは、図4からも判別されるように、アディスアベバ、Bishoftu及びMojoの中大都市を含んでおり、そこでの揚水流量と今回の対象都市の2035年の予測揚水流量を加算した値からは、地下水涵養量に対して揚水流量が35%以上を占める値となっている。
- またSB4-L-Dは、流域面積が狭く地下水涵養量が少ないが、対象の既存井戸の揚水流量が100 L/secであり、50%近い揚水流量の比率となった。

表 2: 地下水涵養量に対する揚水流量の比率（2035 年時点の予測値）

小流域	中大都市の揚水流量（2035 年の予測値）(Y1) ［$10^6 m^3$/year］	対象小都市の揚水流量（2035 年の予測値）(Y2) ［$10^6 m^3$/year］	既存井戸の揚水流量（2035 年予測値）(Y3)$10^6 m^3$/year］	揚水流量合計［$10^6 m^3$/year］（Y=Y1+Y2＋Y3）	年間地下水涵養量 (GWR) [10^6 m^3/year]	Y/GWR [%]
SB2-L	120.90	2.25	11.00	134.15	358.4	37.4
SB3-L	-	0.25	0.42	0.67	37.8	1.8
SB3-R	-	1.65	1.49	3.14	178.1	1.8
SB4-L-U	-	0.32	-	0.32	31.6	1.0
SB4-R	0.36	1.46	0.30	2.12	208.8	1.0
SB5-R	-	2.06	3.36	5.42	161.0	3.3
SB-BSK-W	0.59	0.14	0.49	1.22	120.2	1.0
SB5-L	-	-	1.59	1.59	330.8	0.5
SB-BSK	-	-	1.29	1.29	25.3	5.0
SB4-L-D	-	-	7.03	7.03	15.4	45.6

出典：MP 調査団、データ元：参考資料　④



出典：MP 調査団、データ元：参考資料　④

図 4:　小流域と地下水涵養量及びモデル既存井戸

7(10) プロジェクト・モニタリング・シート

資料 7(10) プロジェクト・モニタリング・シート

Project Monitoring Report on the Preparatory Survey for the Project for Development of Water Supply Facilities of Small Towns in Oromia Region

Grant Agreement No. XXXXXXX

2021, November

Organizational Information

Signer of the G/A (Recipient)	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:
Executing Agency	**Oromia Water and Energy Resources Development Bureau(OWERDB)** Person in Charge Dr. Eng. Habtamu Itefa, Bureau head Contacts Address: Addis Ababa Ethiopia Phone/FAX: Email:
Line Ministry	**Ministry of Water, Irrigation and Energy(MoWIE)** Person in Charge Dr. Eng. Negash Wagesho, State Minister Contacts Address: Addis Ababa Ethiopia Phone/FAX: Email:

General Information:

Project Title	The Preparatory Survey for the Project for Development of Water Supply Facilities of Small Towns in Oromia Region
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

1: Project Description	

1-1 Project Objective

The objective of the Project is to improve access to safe drinking water through installing piped water supply facilities in the target small towns of Oromia Region, thereby contributing to the improvement of livelihoods through reduction of waterborne diseases and burden on collecting water.

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

Higher-level objectives:

The Ethiopian government's goal to improve access to safe water to 75% in urban areas and 85% in rural areas by 2020, as set out in the Growth and Transformation Plan Ⅱ (2015/16～2019/20) (GTP-II), was not achieved. However, the government set a new target to improve access to 100% in both urban and rural areas by 2030 in the next 10-Year National Development Plan (2021-2030), formulated in 2021.

The Project aims to resolve the aforementioned issues by installing piped water supply facilities that supply safe water to the target small towns, and will contribute to the improvement of water services in the government's 10-Year National Development Plan and Sustainable Development Goals 6.

Situation of the target groups:

- The residents of Ude Dhankaka obtain their drinking and living water needs from a privately owned shallow well with a hand pump, Biyo from a privately owned well with a hand pump and a shallow well with a power pump, and Kamise from a reservoir or river. However, the supply is low and the quality of water is not satisfactory, resulting in extremely high levels of water poverty among residents. If the Project is not implemented, residents will have to continue using the existing water sources mentioned above or continue with the option of purchasing water from water vendors. In this case, the economic burden on residents, the cost of water-fetching labor, and lost opportunities due to water-fetching are high, and the impact is far-reaching. Therefore, this option is not recommended as it will worsen the sanitary and social environment of the target town, leading to a decline in the living standards of the residents.
- In Bolo, the households without water supply will have the option of purchasing water from water vendors, pumping and transporting surface water from the Bolo River, about five km west of the main road, or purchasing and transporting water from an existing deep well in Bolo about five km northeast of the main road. In this case, the economic burden on residents, the cost of water-fetching labor, and lost opportunities due to water-fetching are high, and the impact is far-reaching. Therefore, this option is not recommended, as it will worsen the sanitary and social environment of the target town, leading to a decline in the living standards of the residents.
- In Gonde, residents of the area will have to obtain water from public taps in another area or purchase water from water vendors. When the residents purchase water from water vendors, the cost of the water is several times higher than the cost of the water

supply, placing a heavy economic burden on the residents and not improving the water sanitation environment. Even in the case of using public water taps in other areas, the impact is far-reaching because of the high labor burden of transporting water for residents and the cost of lost opportunities due to water fetching. Therefore, this option is not recommended, as it will worsen the sanitary and social environment of the target town, leading to a decline in the living standards of the residents.

- In Areda, piped water supply facilities were constructed in 2001, but they do not satisfy water demand. Additionally, water service does not reach some zones — namely areas around markets at high elevations — due to insufficient water pressure.

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr 2020)	Target (Yr 2029)
Water Supply Amounts (m^3/day) *1	109 *2	1,952 *3
Population Served (people)	14,800*4	47,279
Water consumption per capita (L/day/person)	7.4*5	40.0
Qualitative indicators to measure the attainment of project objectives		
• Ensuring safe water in schools and health facilities • A consistent supply of safe water reduces waterborne infections among residents, leading to reduced health expenditures • A consistent supply of safe water reduces the incidence of diarrheal diseases among residents, helping improve nutrition • A consistent supply of safe water enables women and girls to spend time on social activities instead of fetching water, increasing opportunities for women to participate in society		

*1 : Average daily consumption by residents, not including water loss such as water leakage.

*2 : The average daily water consumption in the base year was calculated from the billed water amount data for the past three years of existing piped water supply facilities.

*3 : The amount of newly developed water volume through the project is 1,844 m^3 / day.

*4: Based on the results of interviews with three towns with existing piped water supply facilities

Areda: 478 household x 4.28 persons per household (socio-economic survey results) = 2,046 persons, Bolo: 10,000 people, Gonde: 675 household x 4.08 persons per household (socio-economic survey results) = 2,754 persons

*5: Per capita water consumption in terms of water supply for individual tap and public tap users accessing existing piped system facilities. 109m3/day x 1000 ÷14,800 = 7.4

2: Details of the Project

2-1 Location

Components	Original *(proposed in the outline design)*	Actual
Construction and Expansion of Water Supply Facilities	Six Small Towns of East Shewa Zone and Arsi Zone in Oromia Region (Ude Dhankaka, Kamise, Biyo, Bolo and Gonde Town)	

2-2 Scope of the work

Components	Original* (proposed in the outline design)		Actual*
1. Construction of Intake Facilities	Deep Wells	N=9	
	Control Buildings	N=9	
	Water Intake Pumps	N=9	
	Power Supply Equipment by solar power generation	N=1	
2. Construction of Water Transmission Facilities	Relay Tanks	N=1	
	Control Buildings	N=1	
	Relay Pumps	N=2	
	Power Supply Equipment	N=1	
	Water Transmission Pipes	About 24.5km	
	Disinfection System	N=6	
3. Construction of Water Distribution Facilities	Reservoirs (Elevated water tank)	N=2	
	Reservoirs (Ground-based water tank)	N=4	
	Water Distribution Pipes	About 73.6km	
4. Construction of Service Installation	Public Taps for Residents	N=88	
	Public Taps for Schools and Health Facilities	N=23	
	Public Taps for Livestock	N=6	
5. Construction of Building	Water Office Building	N=6	
	Diesel Generators	N=1	
6. Others	Fence	N=28	
	Power Source Installation Work	N=14	

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	(proposed in the outline design)	*(at the time of signing the Grant Agreement)*	
Cabinet Approval E/N, G/A Consultant Contract Detailed Design Tender Notice Tender Contract Agreement Construction Work			

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant (Confidential until the Bidding)

Components		Cost (Million Yen)	
Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
1. Construction			
2. Procurement			
3. Software Component			
4. Consultant Services			
5. Contingencies Expenses			
Total			

Note: 1) Date of estimation: April, 2021
2) Exchange rate: 1 US Dollar = 107.08Yen, 1 EUR = 129.30 Yen

2-5-2 Cost borne by the Recipient

Components		Cost (Birr)	
Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
1. Advising commission for Authorization to Pay (A/P) and payment commission to the bank		833,000	
2. Compensation for land acquisition and social monitoring cost		1,328,000	
3. Arrangement of counterparts for the Survey Team during the D/D		36,000	
4. Ensuring customs duties,		123,124,000	

internal taxes and other fiscal levies to be imposed with respect to the purchase of the Products and/or the Services be exempted and to be borne by its designated authority without using the Grant			
5. Clearing and maintaining access road to the sites		820,000	
6. Arrangement of supervisor during the construction period		601,000	
7. Arrangement of counterparts for the soft-component activities		316,000	
8. Implementing construction of protection fences around public faucets		1,000,000	
9. Preparation of maintenance tools owned by each town water utility		279,000	
10. Preparation of the office furniture and office automation equipment owned by each town water utility		1,317,000	
11. Preparation of the initial set of equipment for connecting the water supply pipes of each household owned by each town water utility		1,542,000	
Total		131,196,000	

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original *(at the time of outline design)* [Name] Oromia Water and Energy Resources Development Bureau（OWERDB） [Role] The Oromia Water and Energy Resources Development Board (OWERDB) is responsible for urban and rural water supply projects in the Oromia Region. Their main roles are to develop water supply plan for the entire region, to implement large water supply projects, to provide technical assistance to subordinate organizations and to support for operation and maintenance of water supply facilities. [Institutional and Organizational arrangement (organogram)] The Deputy Directors of the Water and Energy Development Sector and the Water Supply and Sewerage Sector are placed directly under the Director General of the OWERDB, and six directorates and 14 teams are placed under the Sectors. Among these, the directorate in charge of the Project is the Water Resources Management Directorate. [Financial Situation] The budget of the OWERDB is classified into two categories: the recurrent budget, which includes staff salaries, transportation and travel allowances, and the development budget, which is used for infrastructure development such as facility construction and renovation plans. In Ethiopia, the budget year is from July to July of the following year. [Human Resources (number and ability of staff)] The total number of staff in the OWERDB is about 330.
Actual *(PMR)*

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spare parts, etc.)

Original *(at the time of outline design)* "Town Water Board" and "Town Water Supply and Sanitation Services Enterprises (hereinafter referred to as "the Water Utility") in each 6 small towns will be established in the beginning of Construction Stage, and necessary number of counterparts who are appropriate and competent in terms of its purpose of the technical assistance will be deployed. Proposed staffing for Water Utilities in each small town is around 30 to 40 members including president, audit, administration and general service, finance section (cashier and water-meter reader/bill collection), operation and maintenance section (water quality officer, electrician and plumber), operator for submersible motor pump, security officer and tap manager.

Actual *(PMR)*

3-2 Budgetary Arrangement

- Required O&M cost and actual budget allocation for O&M

Original *(at the time of outline design)*
1. Annual Production Cost in 2029: Ude Dhankaka: 2.33 million ETB/year Kamise: 1.64 million ETB/ year Areda : 1.91 million ETB/ year Biyo : 1.57 million ETB/year Bolo : 3.02 million ETB / year Gonde : 4.26 million ETB/year **2. Proposed Water Tariff per jerry can (20 little) in 2029** Ude Dhankaka: 0.22 ETB/jerry can Kamise: 0.35 ETB/ jerry can Areda : 0.35 ETB/ jerry can Biyo : 0.41 ETB/ jerry can Bolo : 0.25 ETB / jerry can Gonde : 0.44 ETB/ jerry can
Actual *(PMR)*

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks (*at the time of outline design)*

Potential Risks	Assessment
1. (Description of Risk) Failure to secure productivity or appropriate water quality	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Probability is considered as low since the Project has investigated the geological and hydrogeological condition at each target small towns and excluded the sites with high uncertainty in the development of groundwater. Furthermore, as it is still difficult to avoid all uncertainties, the Project plan is being considered on the assumption that there will be cases where production wells do not meet the required performance during the construction stage. For this reason, a policy for a case where a production well is not secured was established by referring to the responses of well construction in past Grant Aid projects and the Japanese Grant Aid Guidelines.
	Mitigation Measures and action required during the implementation stage:
	Japanese contractor will conduct maximum eleven (11) drillings during the Construction Stage to secure eight (8) boreholes in total, (Ude Dhankaka (2), Biyo

	(1), Kamise(1), Areda(1), Bolo (2) and Gonde (1)), to be the production boreholes based on the results of the Preparatory Survey. Since it is an area where groundwater development is difficult, the design yield per borehole was calculated based on the results of test drilling of the Preparatory Survey and the water demand at each site. The detailed process of drilling works in the Construction Stage is discussed and agreed by both side.
	Contingency Plan (if applicable):
	When eight (8) production boreholes could not be secured by drilling eleven (11) boreholes, both sides will discuss further actions as following. (a) Considering additional number of drillings on limited budget by both sides. (b) Considering conversion from the test boreholes to the production boreholes. (c) However, as a worst-case scenario, both sides confirmed that if the test borehole cannot be converted to a production well because it does not meet the required performance due to a change in characteristics, this small town will be excluded from the scope of cooperation in the Project.

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

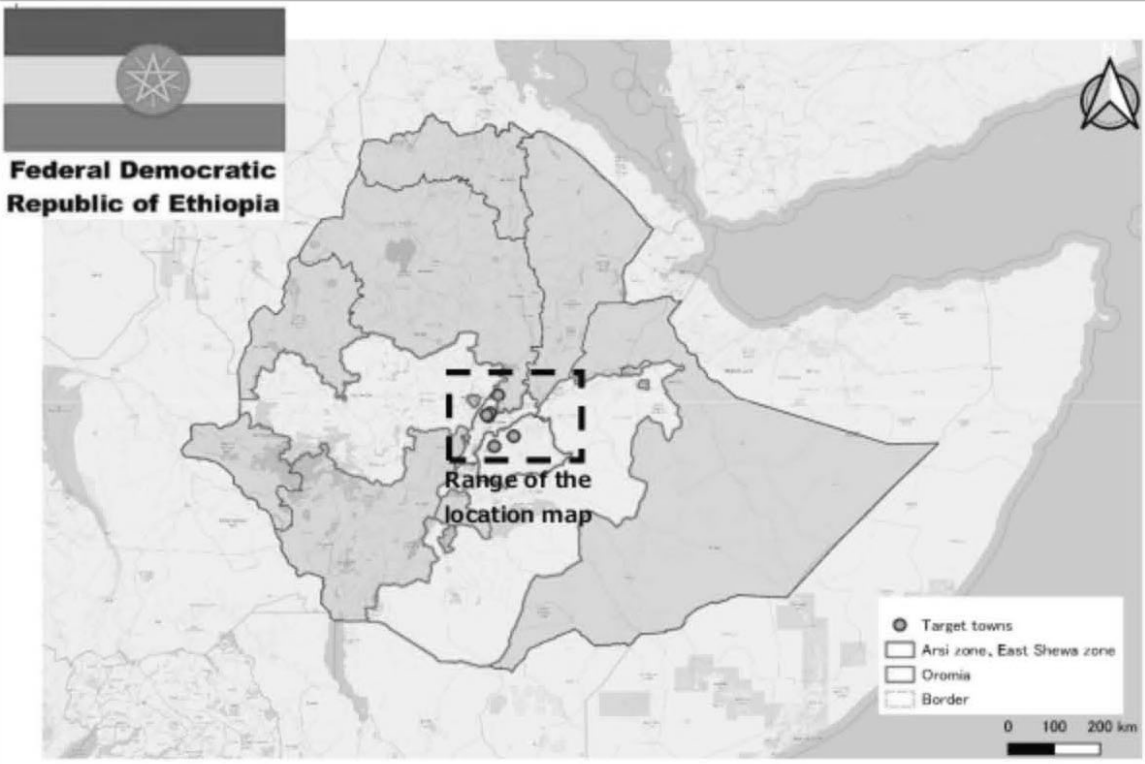
Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant

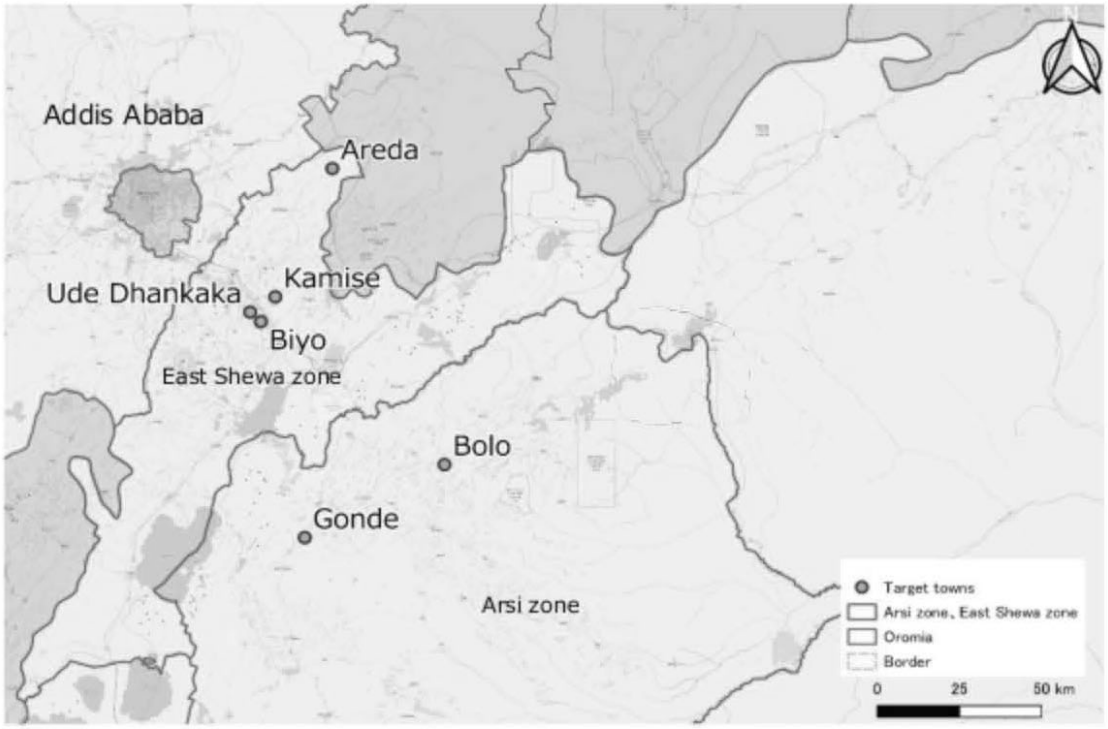
Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
- Contractor's Main Staff List

4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final) only)
8. Pictures (by JPEG style by CD-R) (PMR (final)only)
9. Equipment List (PMR (final) only)
10. Drawing (PMR (final) only)
11. Report on RD (After project)

Attachment 1 Project Location Map



Wide area map



Location map

Preparatory Survey on The Project for Development of Water Supply Facilities of Small Towns in Oromia Region in Ethiopia

Attachment 5 Environmental Monitoring Form / Social Monitoring Form

(1) Monitoring Form for Environment Management Plan and Monitoring Plan

1. Response/Actions to Comments and Guidance from Government Authorities and the Public

Date:

Venue:

Organizations or Communities:

Monitoring items	Status during the reporting period
Date, time, and number of participants in the community consultation	
Opinions and comments from participants and responses from the Executing Agency	

2. Mitigation Measures

－Pollution Control

Survey item	Monitoring items	Status during the reporting period
Air pollution	Dust control (frequency of water spraying)	
	Dust control (covering of earthwork areas)	
Soil pollution	Fuel and oil spills	
Water pollution (drinking water)	Water quality (turbidity/odor)	
Water Pollution (surrounding water sources)	Surface water quality (turbidity/odor)	* Photographing the river channel (flowing water) at the construction site
Soil erosion	Extent and degree of erosion	* On-site photography as needed
Water use (drinking water, domestic water)	Disposal method of generated residual soil	

－Waste

Monitoring items	Status during the reporting period
Disposal of rubble and construction materials	
Amount of waste (loaded onto the back of a truck for transportation)	
Disposal method of construction residual soil	

－Noise and Vibration

Item	Measured Value (Average Value)	Measured Value (Maximum Value)	Baseline Value	Local Standards	Referenced International Standards	Remarks (Measurement location, frequency, method, etc.)
Noise level				-	85 (Japanese Standards[1])	

[1] Reference to "Specific Construction Work" in the Noise Regulation Law, Ministry of the Environment.

Vibration level				-	75 (Japanese Standards[2])	

3. Natural Environment

Survey item	Monitoring items	Status during the reporting period
Protected Area	Permits for cutting trees	
	Coverage of under bush removal	
	Confirmation of vegetation during under bush clearing and logging (whether it is not an endangered species)	*Describe the survey results from OEFCCA
Ecosystem	Identification of bird nesting sites	
	Identification of habitats and migration routes of wildlife	*Describe the survey results from OEFCCA and local NGOs
	Curing of openings	
Topography and Geology	Removal of all construction materials and temporary structures	

－Decrease in groundwater level

Item (Unit)	Measurement location	Data for water level
Groundwater level	Wells in the vicinity of the Ude Dhankaka test well	

4. Complaints related to Environmental Impact

Number of complaints	Complaints	Response status and results

－Other points to note (Write freely in the box below)

[2] Reference to "Specific Construction Work" in the Vibration Regulation Law, Ministry of the Environment.

(2) Social Monitoring Form (Land acquisition and Resettlement)

－Preparation of Alternative Agricultural Land

No.	Small Town Name	Status of Implementation (completed/not completed) *State the date if completed	Details (selection measures of alternative land, consultation with PAPs, etc.)	Scheduled Completion Date
1	Ude Dhankaka			
2	Kamise			
3	Areda			
4	Biyo			
5	Bolo			
6	Gonde			

－Community Consultation

No	Date/Time	Location	Discussions, main comments and replies from PAPs
1			
2			

－Status of Compensation Payment (for PAHs with the Land Taken constitutes 20% or More of the Total Productive Area

Small Town Name	PAHs No.	Land to be Acquired (m^2)	Estimated Compensation Cost (Birr)	Paid Compensation Cost	Payment Date
Ude Dhankaka (ES-6)	ES6-1	24	8,640		
	ES6-2	24	9,257		
	ES6-3	24	8,400		
Kamise (ES-8)	ES8-2	24	9,000		
	ES8-3	400	25,800		
Areda (ES-10)	ES10-1	24	7,920		
	ES10-2	24	10,400		
	ES10-3	24	7,200		
	ES10-4	24	7,043		
	ES10-5	24	7,200		
	ES10-6	24	4,582		
	ES10-9	10	1,733		
Biyo(ES-11)	ES11-2	24	10,800		
	ES11-3	24	7,920		
	ES11-4	24	12,600		
	ES11-5	24	11,700		
	ES11-6	24	7,200		
Bolo (AR-2)	AR2-2	24	3,240		
	AR2-3	24	3,600		
	AR2-4	24	6,300		
	AR2-5	24	4,019		
	AR2-6	24	6,660		
	AR2-7	24	3,600		
	AR2-8	24	4,886		

Small Town Name	PAHs No.	Land to be Acquired (m^2)	Estimated Compensation Cost (Birr)	Paid Compensation Cost	Payment Date
	AR2-9	24	4,000		
	AR2-10	48	8,610		
	AR2-12	30	7,000		
Gonde (AR-6)	AR6-2	24	7,056		
	AR6-3	24	5,040		
	AR6-4	24	5,455		
	AR6-7	225	59,285		
	AR6-8	75	17,500		
	AR6-9	60	17,234		

－Status of Compensation Payment (for PAHs with the Land Taken constitutes less than 20% of the Total Productive Area)

Small Town Name	PAHs No.	Land to be Acquired (m^2)	Estimated Compensation Cost (Birr)	Paid Compensation Cost	Payment Date	Provision of Alternative Land	Provision Date
Kamise (ES-8)	ES8-1	400	30,505				
	ES8-4	400	37,923				
	ES8-5	830	78,494				
Areda (ES-10)	ES10-7	219	16,249				
	ES10-8	400	25,765				
Biyo (ES-11)	ES11-1	400	34,554				
	ES11-7	400	46,935				
Bolo (AR-2)	AR2-1	400	26,971				
	AR2-11	400	31,262				
Gonde (AR-6)	AR6-1	400	35,208				
	AR6-5	317	26,552				
	AR6-6	400	26,465				

－Implementation Status of Restoration of Livelihoods

Survey Item	Monitoring Item	Results
Priority employment for socially vulnerable groups	Status of employment provision for 3 female-headed households, 33 households with children under 18 years old, and 12 households with elderly (over 60 years old)	
Priority in employment for water retailers	Status of employment provision for 14 water retailers in 6 small cities	

－Status of public awareness of the impact on existing infrastructure and services

Targeted infrastructure and services	Period of influence	Whether or not residents are informed	Response status and results

－Complaints from affected residents

Number of complaints	Complaints	Response status and results

－Safety education and traffic accidents

Action item	Action details	Results of action
Safety education	Implementation of safety education	
Traffic accident	Accident occurrence/response records	

－Other points to note (Write freely in the box below)

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
						Price (Decreased) E=C−D	Price (Increased) F=C+D
1	Item 1	●●t	●	●	●	●	●
2	Item 2	●●t	●	●	●		
3	Item 3						
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st ●month, 2015	2nd ●month, 2015	3rd ●month, 2015	4th	5th	6th
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

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Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
（Actual Expenditure by Construction and Equipment each）

		Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost		(A/D%)	(B/D%)	(C/D%)	
	Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
	others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost		(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost		(A/D%)	(B/D%)	(C/D%)	
Total		(A/D%)	(B/D%)	(C/D%)	