BASIC SURVEY FOR CONSTRUCTION OF BOREHOLE DATABASE IN AFRICAN COUNTRIES

USERS' MANUAL FOR BOREHOLE DATASET OF GRANT AID COOPERATION PROJECTS

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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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Table of Content

Table List

1. Outline of Borehole Dataset constructing work

1.1. Project included in Borehole Dataset

The project list contained in the Borehole Dataset is shown in Table 1-1. Project ID is the symbol to identify the project that the borehole was constructed, and id given to each project. However, if a project is separated to plural phases and it is impossible to identify how many boreholes were drilled in each phase, there are several phases in the project, one ID is given to such project. Therefore, the number of Project ID is less than the number of each phase counted based on the E/N.

The locations of these boreholes are shown in Figure 1-1.

Table 1-1   Projects stored in the Borehole Dataset

Country	Year	Project	Number of wells
Angola	2001	PROJECT FOR WATER SUPPLY IN LUANDA PROVINCE（PHASE II)	7
Benin	1988	PROJET POUR L' EXPLOITATION DES EAUX SOUTERRAINES (PHASE II)	135
Benin	1992	PROJET POUR L' EXPLOITATION DES EAUX SOUTERRAINES (PHASE III)	355
Benin	1995	PROJET POUR L' EXPLOITATION DES EAUX SOUTERRAINES (PHASE IV)	415
Benin	2005	PROJET D'APPROVISIONNEMENT EN EAU POTABLE DANS LA REGION RURALE (PHASE V)	293
Benin	2009	DE L'ETUDE DU CONCEPT DE BASE POUR LE PROJET D'APPROVISIONNEMENT EN EAU POTABLE DANS LA REGION RURALE (PHASE VI)	15
Benin	2009	PROJET D' APPROVISIONNEMENT EN EAU POTABLE DANS LA REGION RURALE（PHASE VI)	176
Benin	2016	DE L'ETUDE DU PLAN DE BASE SUR LE PROJET D'APPROVISIONNEMENT EN EAU POTABLE PAR L'EXPLOITATION DES EAUX SOUTERRAINES DES COMMUNES DE GLAZOUÉ ET DE DASSA-ZOUMÉ	20
Burkina Faso	1998	PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE (T-1)	90
Burkina Faso	1999	PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE (T-2)	249
Burkina Faso	2000	PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE (T-3)	130
Burkina Faso	2009	PROJET DE L'APPROVISIONNEMENT EN EAU POTABLE DANS LE PLATEAU CENTRAL ET LE CENTRE SUD (T-1)	130
Burkina Faso	2010	PROJET DE L'APPROVISIONNEMENT EN EAU POTABLE DANS LE PLATEAU CENTRAL ET LE CENTRE SUD (T-2)	204
Burkina Faso	2011	PROJET DE L'APPROVISIONNEMENT EN EAU POTABLE DANS LE PLATEAU CENTRAL ET LE CENTRE SUD (T-3)	100
Burkina Faso	2012	PROJECT FOR CONSTRUCTION OF THE HEALTH AND SOCIAL PROMOTION CENTERS	33
Burkina Faso	2013	PROJET DE L'APPROVISIONNEMENT EN EAU POTABLE DANS LE PLATEAU CENTRAL ET LE CENTRE SUD (PHASE2, T-1)	159
Burkina Faso	2014	PROJET DE L'APPROVISIONNEMENT EN EAU POTABLE DANS LE PLATEAU CENTRAL ET LE CENTRE SUD (PHASE2, T-2)	264
Burkina Faso	2015	PROJET DE L'APPROVISIONNEMENT EN EAU POTABLE DANS LE PLATEAU CENTRAL ET LE CENTRE SUD (PHASE2, T-3)	161
Cameroon	1995	PROJECT FOR RURAL WATER SUPPLY (T-2)	14
Cameroon	1996	PROJECT FOR RURAL WATER SUPPLY (T-3)	16
Cameroon	2006	PROJET D'HYDRAULIQUE RURAL (PHASE IV, T-1)	101
Cameroon	2007	PROJET D'HYDRAULIQUE RURAL (PHASE IV, T-2)	138
Cameroon	2012	PROJECT FOR RURAL WATER SUPPLY (T-1)	70
Cote d'Ivoire	1997	PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN MILIEU RURAL (T-2)	92
Cote d'Ivoire	1998	LE PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN MILIEU RURAL (T-3)	293

Country	Year	Project	Number of wells
Cote d'Ivoire	2015	PROJECT ON HUMAN RESOURCE DEVELOPMENT FOR STRENGTHENING LOCAL ADMINISTRATION IN CENTRAL AND NORTHERN AREAS	46
Cote d'Ivoire	1992, 1993, 1993	PROJET HYDRAULIQUE VILLAGEOISE DANS LA REGION DU NORD	541
Eswatini	1997	RURAL WATER SUPPLY PROJECT	154
Eswatini	2001	BASIC DESIGN STUDY PROJECT FOR RURAL WATER SUPPLY（PHASE 2）	15
Eswatini	2002	PROJECT FOR RURAL WATER SUPPLY（PHASE 2）	111
Ethiopia	2005	PROJECT FOR THE WATER SUPPLY IN SOUTHERN NATIONS; NATIONALITIES AND PEOPLE' REGIONAL STATE (T-1)	144
Ethiopia	2006	PROJECT FOR THE WATER SUPPLY IN SOUTHERN NATIONS; NATIONALITIES AND PEOPLE' REGIONAL STATE (T-2)	199
Ethiopia	2008	PROJECT FOR RURAL WATER SUPPLY IN OROMIA REGION (T-1)	31
Ethiopia	2008	PROJECT FOR RURAL WATER SUPPLY IN TIGRAY REGION	122
Ethiopia	2009	PROJECT FOR RURAL WATER SUPPLY IN OROMIA REGION (T-2)	41
Ethiopia	2010	PROJECT FOR RURAL WATER SUPPLY IN OROMIA REGION (T-3)	6
Ethiopia	2011	PROJECT FOR RURAL WATER SUPPLY IN OROMIA REGION (T-4)	13
Gambia	1993	PROJECT FOR INTEGRATED WATER USE	10
Gambia	2004, 2005, 2006	PROJECT FOR INTEGRATED WATER USE (PHASE II)	26
Ghana	2000	PROJECT FOR RURAL WATER SUPPLY (PHASE IV)	178
Ghana	1990, 1991	PROJECT FOR RURAL WATER SUPPLY (PHASE II)	247
Guinea	1999	PROJET D'APPROVISIONNEMENT RURAL EN EAU POTABLE DE LA GUINEE MARITIME (T-1)	17
Guinea	2000	PROJET D'APPROVISIONNEMENT RURAL EN EAU POTABLE DE LA GUINEE MARITIME (T-2)	125
Guinea	2001	PROJET D'APPROVISIONNEMENT RURAL EN EAU POTABLE DE LA GUINEE MARITIME (T-3)	115
Kenya	2006	PROJECT FOR RURAL WATER SUPPLY (PHASE I)	78
Kenya	2011	SECOND PREPARATORY SURVEY ON THE PROJECT FOR RURAL WATER SUPPLY IN BARINGO COUNTY	10
Kenya	2011	PROJECT FOR RURAL WATER SUPPLY（PHASE2）	73
Kenya	2014, 2015	PROJECT FOR RURAL WATER SUPPLY IN BARINGO COUNTY	135
Lesotho	1995	WATER SUPPLY AND SANITATION PROJECT FOR PRIMARY SCHOOLS (STAGE-1)	134
Lesotho	1996	WATER SUPPLY AND SANITATION PROJECT FOR PRIMARY SCHOOLS (STAGE-2)	67
Madagascar	2000	PROJET DE L'EXPLOITATION DES EAUX SOUTERRAINES DANS LA REGION SUD-OUEST (PHASE II, T-1)	11
Madagascar	2003	PROJET DE L'EXPLOITATION DES EAUX SOUTERRAINES DANS LA REGION SUD-OUEST (PHASE II, T-3)	67
Madagascar	2004	PROJET DE L'EXPLOITATION DES EAUX SOUTERRAINES DANS LA REGION SUD-OUEST (PHASE II, T-4)	83
Malawi	1992	MCHINJI GROUNDWATER DEVELOPMENT PROJECT (T-1)	112
Malawi	1993	MCHINJI GROUNDWATER DEVELOPMENT PROJECT (T-2)	110
Malawi	1997	RURAL WATER SUPPLY PROJECT IN THE WEST OF MZIMBA DISTRICT (T-2)	295
Malawi	1998	RURAL WATER SUPPLY PROJECT IN THE WEST OF MZIMBA DISTRICT (T-3)	148
Malawi	2006	PROJECT FOR THE GROUNDWATER DEVELOPMENT IN LILONGWE WEST (T-2)	24
Malawi	2007	PROJECT FOR THE GROUNDWATER DEVELOPMENT IN LILONGWE WEST (T-3)	129
Malawi	2010	PROJECT FOR SELECTED MARKET CENTRES AND RURAL WATER SUPPLY IN MCHINJI AND KASUNGU DISTRICT	12
Malawi	2011	BASIC DESIGN STUDY PROJECT FOR GROUNDWATER DEVELOPMENT IN MWANZA AND NENO	5
Malawi	2011	PROJECT FOR GROUNDWATER DEVELOPMENT IN MWANZA AND NENO	123

Country	Year	Project	Number of wells
Malawi	2012	PROJECT FOR SELECTED MARKET CENTRES AND RURAL WATER SUPPLY IN MCHINJI AND KASUNGU DISTRICT	334
Mali	1999	LE PROJET D'ALIMENTATION EN EAU POTABLE DANS LES CERCLES DE KATI, KOULIKORO ET KANGABA (T-1)	106
Mali	2000	LE PROJET D'ALIMENTATION EN EAU POTABLE DANS LES CERCLES DE KATI, KOULIKORO ET KANGABA (T-2)	139
Mali	2003	PROJET D'APPROVISIONNEMENT EN EAU POTABLE DANS LES REGIONS DE KAYES, SEGOU ET MOPTI (T-1)	38
Mali	2004	PROJET D'APPROVISIONNEMENT EN EAU POTABLE DANS LES REGIONS DE KAYES, SEGOU ET MOPTI (T-2)	135
Mali	2005	PROJET D'APPROVISIONNEMENT EN EAU POTABLE DANS LES REGIONS DE KAYES, SEGOU ET MOPTI (T-3)	129
Mali	2009	PROJET D' ALIMENTATION EN EAU POTABLE DANS LA RÉGION DE SIKASSO	187
Mali	1993, 1994	PROJET POUR L'HHYDRAULIQUE VILLAGEOISE VISANT A L'ERADICATION DU VER DE GUINEE	717
Mauritania	1997	LE PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE (PHASE 1)	28
Mauritania	1998	LE PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE (PHASE 2, T-1)	92
Mauritania	1999	LE PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE (PHASE 2, T-2)	150
Mauritania	2000	LE PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE (PHASE 2, T-3)	93
Mauritania	2004	PROJET D'APPROVISIONNEMENT EN EAU POTABLE DANS LA REGION AUSTRALE (T-1)	17
Mauritania	2005	PROJET D'APPROVISIONNEMENT EN EAU POTABLE DANS LA REGION AUSTRALE (TRANCH 2)	24
Mauritania	1993 ~ 1996	PROJET D'HYDROULIIQUE RURALE DU CENTRE-SUD MAURITANEN	232
Mozambique	1996	PROJECT FOR THE DEVELOPMENT OF RURAL DRINKING WATER SUPPLY IN GAZAPROVINCE (T-1)	30
Mozambique	1996	PROJECT FOR THE DEVELOPMENT OF RURAL DRINKING WATER SUPPLY IN GAZAPROVINCE (T-2)	178
Mozambique	2000	PROJECT FOR GROUNDWATER DEVELOPMENT FOR RURAL WATER SUPPLY IN ZAMBEZIA PROVINCE (T-1)	26
Mozambique	2001	PROJECT FOR GROUNDWATER DEVELOPMENT FOR RURAL WATER SUPPLY IN ZAMBEZIA PROVINCE (T-2)	86
Mozambique	2002	PROJECT FOR GROUNDWATER DEVELOPMENT FOR RURAL WATER SUPPLY IN ZAMBEZIA PROVINCE (T-3)	59
Niger	1987	PROJECT FOR RURAL WATER SUPPLY (T-1)	25
Niger	1988	PROJECT FOR RURAL WATER SUPPLY (T-2)	82
Niger	1990	PROJET D'EXPLOITATION DES EAUX SOUTERRAINES	108
Niger	1990	PROJET DE REHABILITATION DE LA REGION DE OUALLAM EN REPUBLIQUE DU NIGER (T-1)	18
Niger	1991	PROJET DE REHABILITATION DE LA REGION DE OUALLAM EN REPUBLIQUE DU NIGER (T-2)	51
Niger	1992	PROJET DE REHABILITATION DE LA REGION DE OUALLAM EN REPUBLIQUE DU NIGER (T-3)	38
Niger	1994	PROJET DE REHABILITATION DE LA REGION DE OUALLAM EN REPUBLIQUE DU NIGER PHASE II (T-1)	17
Niger	1995	PROJET DE REHABILITATION DE LA REGION DE OUALLAM EN REPUBLIQUE DU NIGER PHASE II (T-2)	46
Niger	1996	PROJET DE REHABILITATION DE LA REGION DE OUALLAM EN REPUBLIQUE DU NIGER PHASE II (T-3)	22
Niger	1997	PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE (T-1)	19
Niger	1998	PROJET D'APPROVISONMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE (T-2)	106

Country	Year	Project	Number of wells
Niger	2005	PROJET D'APPROVISONMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE DANS LA REGION DE ZINDER (T-2)	55
Niger	2006	PROJET D'APPROVISONMENT EN EAU POTABLE EN VUE DE L'ERADICATION DU VER DE GUINEE DANS LA REGION DE ZINDER (T-3)	130
Niger	2009, 2010	PROJET D' APPROVISIONNEMENT EN EAU POTABLE EN VUE DE L' ÉRADICATION DU VER DE GUINÉE DANS LA RÉGION DE TILLABÉRI (T-2, 3)	240
Senegal	2004	PROJET D'APPROVISIONNEMENT EN EAU EN MILIEU RURAL (T-1)	7
Senegal	2005	PROJET D'APPROVISIONNEMENT EN EAU EN MILIEU RURAL (T-2)	8
Senegal	2009	PROJET D'APPROVISIONNEMNET EN EAU POTABLE DANS LA RÉSION DE TAMBACOUNDA	21
Senegal	2015	PROJET DE L'APPROVISIONNEMENT EN EAU POTABLE ET DE L'AMÉLIORATION DES CONDITIONS D'HYGIÈNE DANS LES ZONES RURALES	5
South Africa	2003	PROJECT FOR RURAL WATER SUUPLY AND PROVISION OF SANITATION IN EASTERN CAPE (T-1)	23
Tanzania	1996	PROJECT FOR IMPROVEMENT OF WATER SUPPLY AND MEDICAL SERVICE IN REFUGEES AFFECTED AREAS OF KAGERA REGION (T-1)	70
Tanzania	1997	PROJECT FOR IMPROVEMENT OF WATER SUPPLY AND MEDICAL SERVICE IN REFUGEES AFFECTED AREAS OF KAGERA REGION (T-2)	61
Tanzania	2004	BASIC DESIGN STUDY PROJECT FOR WATER SUPPLY DEVELOPMENT AROUND THE METROPOLITAN AREA	10
Tanzania	2004	PROJECT FOR RURAL WATER SUPPLY IN LINDI AND MTWARA REGIONS (T-2)	155
Tanzania	2005	PROJECT FOR RURAL WATER SUPPLY IN LINDI AND MTWARA REGIONS (T-3)	79
Tanzania	2006	PROJECT FOR ZANZIBAR URBAN WATER SUPPLY DEVELOPMENT	7
Tanzania	2007	DETAIL DESIGN STUDY PROJECT FOR WATER SUPPLY DEVELOPMENT AROUND THE METROPOLITAN AREA	24
Tanzania	2007	PROJECT FOR ZANZIBAR URBAN WATER SUPPLY DEVELOPMENT（PHASE 2)	6
Tanzania	2008	PROJECT FOR WATER SUPPLY DEVELOPMENT AROUND THE METROPOLITAN AREA	21
Tanzania	2009	PROJECT FOR RURAL WATER SUPPLY IN MWANZA AND MARA REGIONS	64
Tanzania	2010	PROJECT OF RURAL WATER SUPPLY IN TABORA REGION	16
Tanzania	2011	STUDY ON WATER RESOURCES MANAGEMENT AND DEVELOPMENT IN WAMI/RUVU BASIN	19
Tanzania	2012 ～ 2014	PROJECT OF RURAL WATER SUPPLY IN TABORA REGION	261
Togo	1985	PROJET DU DEVELOPPEMENT DES EAUX SOUTERRAINES (T-1)	3
Togo	1986	PROJET DU DEVELOPPEMENT DES EAUX SOUTERRAINES (T-2)	98
Togo	1990	PROJECT FOR GROUNDWATER DEVELOPMENT (T-1)	24
Togo	1991	PROJECT FOR GROUNDWATER DEVELOPMENT (T-2)	175
Togo	1997	PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN MILIEU RURAL (T-1)	37
Togo	1998	PROJET D'APPROVISIONNEMENT EN EAU POTABLE EN MILIEU RURAL (T-2)	587
Togo	2010	RAPPORT DE L'ETUDE PREPARATOIRE (DEUXIEME) SUR LE PROJET D'APPROVISIONNEMENT EN EAU POTABLE ET ASSAINISSEMENT EN MILIEU RURAL ET SEMI-URBAIN DANS LES REGIONS MARITIME ET SAVANES	14
Togo	2011	PROJET D'APPROVISIONNEMENT EN EAU POTABLE ET ASSAINISSEMENT EN MILIEU RURAL ET SEMI-URBAIN DANS LES RÉGIONS MARITIME ET SAVANES	141
Uganda	1997	PROJECT FOR RURAL WATER SUPPLY (PHASE I)	60
Uganda	1997	PROJECT FOR RURAL WATER SUPPLY (PHASE 2, T-2)	218
Uganda	1999	PROJECT FOR RURAL WATER SUPPLY (PHASE 2, T-1)	172
Uganda	1999	PROJECT FOR RURAL WATER SUPPLY (PHASE 2, T-3)	193
Uganda	2003	PROJECT FOR RURAL WATER SUUPLY (PHASE II, T-1)	77
Uganda	2004	PROJECT FOR RURAL WATER SUUPLY (PHASE II, T-2)	110
Uganda	2010	DEVELOPMENT STUDY ON WATER RESOURCES DEVELOPMENT AND MANAGEMENT FOR LAKE KYOGA BASIN	20
Uganda	2012	PREPARATORY SURVEY PROJECT FOR PROVISION OF IMPROVED WATER SOURCE FOR RETURNED IDP IN ACHOLI SUB-REGION	10
Uganda	2013	PROJECT FOR PROVISION OF IMPROVED WATER SOURCE FOR RESETTLED INTERNALLY DISPLACED PERSONS IN ACHOLI SUB-REGION	101

Country	Year	Project	Number of wells
Uganda	2015	PREPARATORY SURVEY PROJECT FOR RURAL WATER SUPPLY PHASE III IN LAKE KYOGA BASIN, EASTERN UGANDA	20
Uganda	2017	PROJECT FOR RURAL WATER SUPPLY IN LAKE KYOGA BASIN, EASTERN UGANDA	1
Zambia	1985	GROUND WATER DEVELOPMENT PROJECT	51
Zambia	1988	PROJECT FOR GROUNDWATER DEVELOPMENT IN SOUTHERN PROVINCE	48
Zambia	1991	PROJECT FOR RURAL WATER SUPPLY DEVELOPMENT (T-1)	20
Zambia	1992	PROJECT FOR RURAL WATER SUPPLY DEVELOPMENT (T-2)	112
Zambia	1993	PROJECT FOR RURAL WATER SUPPLY DEVELOPMENT (T-3)	52
Zambia	1994	PROJECT FOR RURAL WATER SUPPLY DEVELOPMENT (T-4)	63
Zambia	1994	URGENT WATER SUPPLY PROJECT IN SATELLITE AREA OF LUSAKA (T-2)	4
Zambia	1994	URGENT WATER SUPPLY PROJECT IN SATELLITE AREA OF LUSAKA (T-3)	2
Zambia	1994	URGENT WATER SUPPLY PROJECT IN SATELLITE AREA OF LUSAKA (T-4)	2
Zambia	1997	SOUTHERN PROVINCE WATER SUPPLY PROJECT (PHASE II, T-2)	195
Zambia	1997	RURAL WATER SUPPLY PROJECT IN BINGA DISTRICT (T-1)	8
Zambia	1998	PROJECT FOR CONSTRUCTION OF BASIC SCHOOLS IN LUSAKA (T-1)	4
Zambia	1998	RURAL WATER SUPPLY PROJECT IN BINGA DISTRICT (T-2)	41
Zambia	1999	PROJECT FOR CONSTRUCTION OF BASIC SCHOOLS IN LUSAKA (T-2)	4
Zambia	2000	PROJECT FOR GROUNDWATER DEVELOPMENT AND SANITAION IMPROVEMENT IN DROUGHT PRONE RURAL AREAS (T-2)	252
Zambia	2001	PROJECT FOR GROUNDWATER DEVELOPMENT AND SANITAION IMPROVEMENT IN DROUGHT PRONE RURAL AREAS (T-3)	204
Zambia	2004	PROJECT FOR GROUNDWATER DEVELOPMENT AND SANITAION IMPROVEMENT IN NORTHERN PROVINCE (T-1)	84
Zambia	2005	PROJECT FOR GROUNDWATER DEVELOPMENT AND SANITAION IMPROVEMENT IN NORTHERN PROVINCE (T-2)	173
Zambia	2010	PROJECT FOR GROUNDWATER DEVELOPMENT IN LUAPULA PROVINCE (PHASE 2)	312
Zimbabwe	2014	PROJECT FOR GROUNDWATER DEVELOPMENT IN LUAPULA PROVINCE (PHASE 3)	268
Zimbabwe	2007, 2008	PROJECT FOR GROUNDWATER DEVELOPMENT IN LUAPULA PROVINCE	280

Projects with Additional Information only

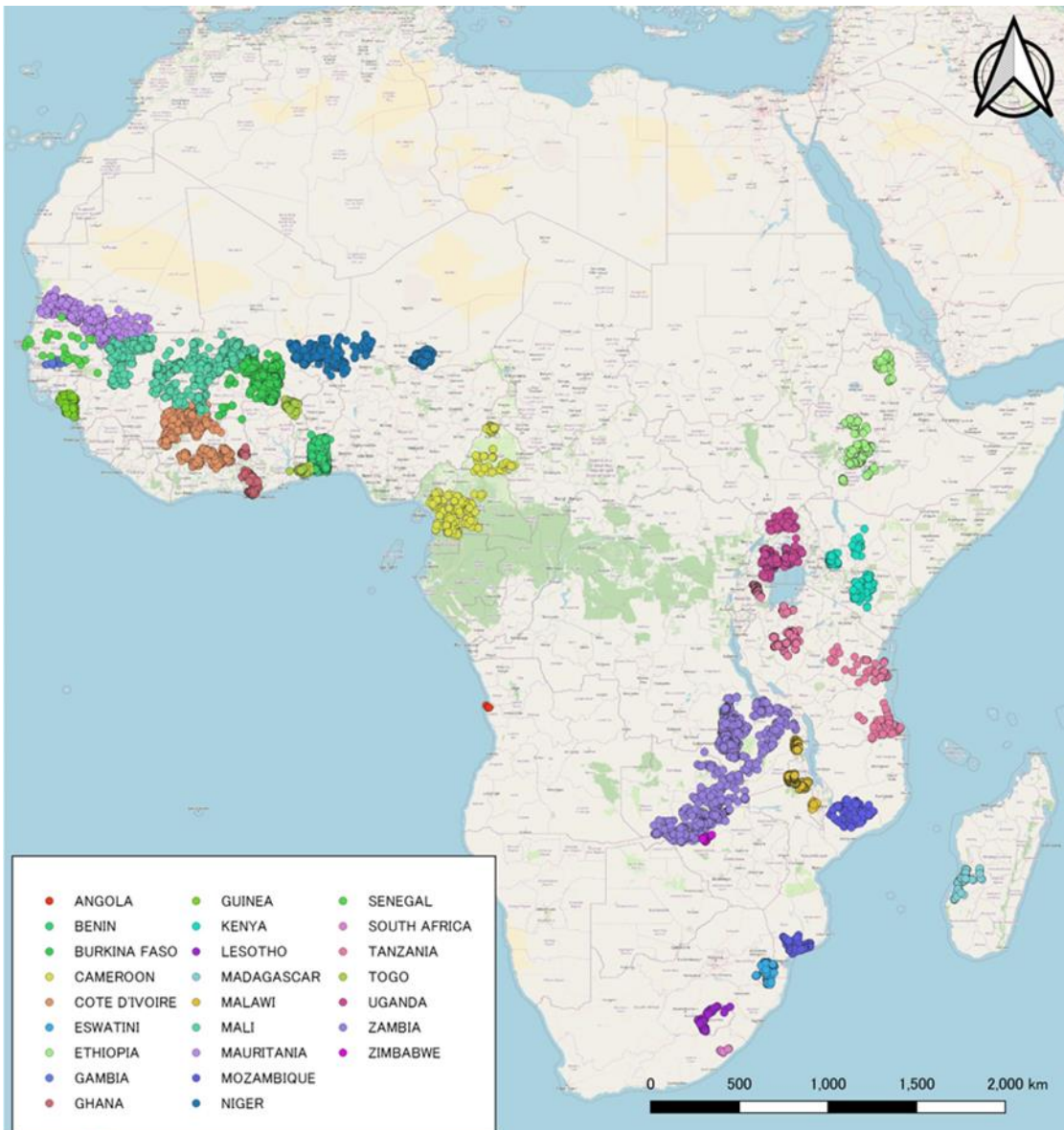| Country	Year	Project Name	Number of wells
Benin	2015	PROJET D'APPROVISIONNEMENT EN EAU POTABLE PAR L'EXPLOITATION DES EAUX OUTERRAINES DES COMMUNES DE GLAZOUÉ ET DE DASSA-ZOUMÉ	4
Uganda	2021	BASIC SURVEY FOR CONSTRUCTION OF BOREHOLE DATABASE OF AFRICAN COUNTRIES	

Figure 1-1   Location of the boreholes contained in the Dataset

1.2.   Folders and files constituting the Dataset

The Borehole Dataset is a folder as shown in Figure 1.3. The folder consists of Borehole Dataset MS Excel files and five (5) folders. Borehole Dataset MS Excel files is composed of seven (7) sheets: Borehole Information, Additional Information, Update Information, Latest Information, Project Information, Local Administrative Division and Project Extraction sheets. Five (5) folders are geological column folder (GC), geophysical survey folder (GS), map folder (MAP), photo folder (PHOTO) and pumping test folder (PT).
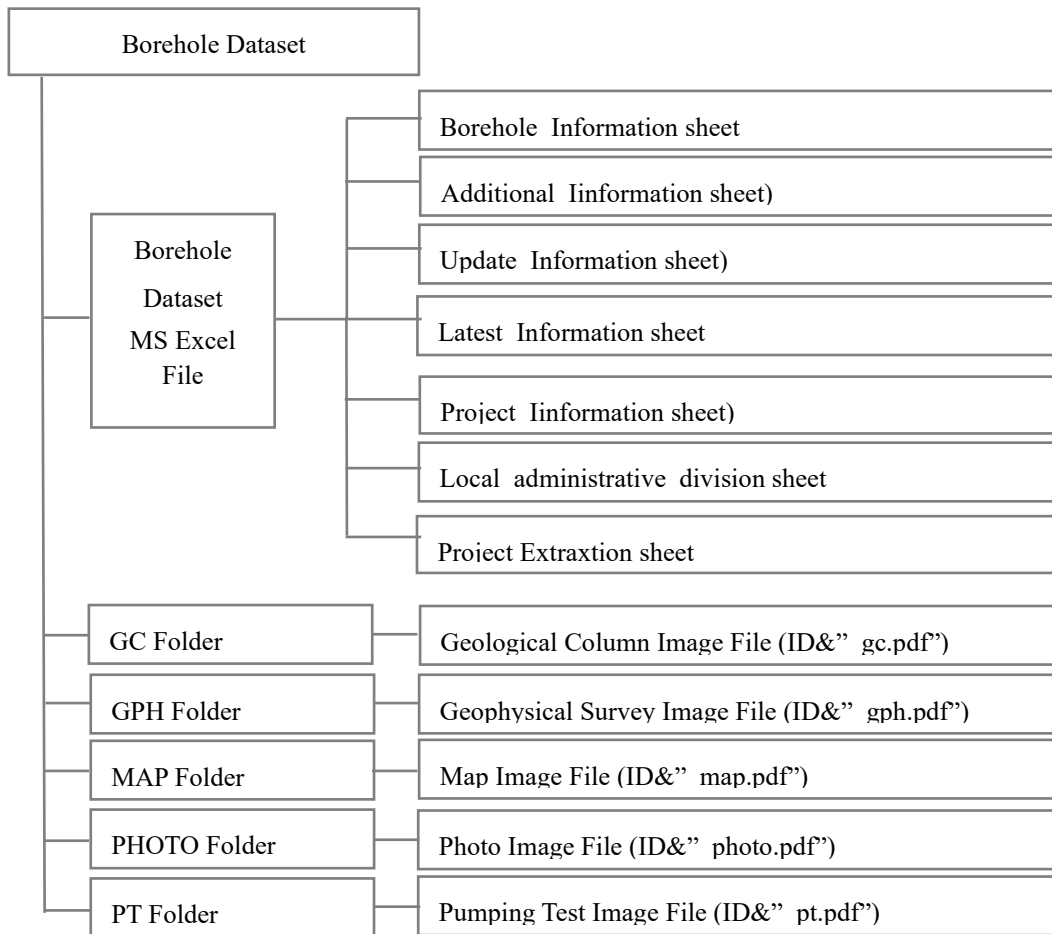
Figure 1-2   Structure of folders and a file in Borehole Dataset

The diagram shows the structure of folders and a file in Borehole Dataset:

- **Borehole Dataset**
  - **Borehole Dataset MS Excel File**
    - Borehole Information sheet
    - Additional Iinformation sheet)
    - Update Information sheet)
    - Latest Information sheet
    - Project Iinformation sheet)
    - Local administrative division sheet
    - Project Extraxtion sheet
  - **GC Folder** — Geological Column Image File (ID&" gc.pdf")
  - **GPH Folder** — Geophysical Survey Image File (ID&" gph.pdf")
  - **MAP Folder** — Map Image File (ID&" map.pdf")
  - **PHOTO Folder** — Photo Image File (ID&" photo.pdf")
  - **PT Folder** — Pumping Test Image File (ID&" pt.pdf")

1.3.   Information contained in the Borehole Dataset MS Excel File

The information contained in the Borehole Dataset MS Excel File is given below.

1.3.1.   Information about well locations, drilling, pumping tests, and facilities

Data related to borehole location (coordinates), drilling results, pumping test, water quality analysis, facilities installed to the borehole are stored in the Borehole Information sheet. In case of that the stored boreholes were newly surveyed: pumping test, water quality analysis or measurement of coordinates, such data are stored in Additional information sheet, Update information sheet or Latest Information sheet. Table 1-2 shows the items of data related to borehole location, drilling results pumping test and facilities.

The field name indicates the data stored in the column by one name. The item name contains large, medium, and small classifications in the column, therefore it is not suitable as a name when using the Borehole Information sheet for other tool or software, such as GIS. The field name should be used in such case.

Table 1-2 Items for well location, drilling, pumping test and facilities

	Item	Content	Field Name	Notation	Notation when data is unknown or not existing
	Project ID	Project identification name	Project_ID	ISO country code & three digits number	
	Borehole ID	Borehole identification name	Borehole_ID	Project ID & three digits number	
Borehole location information	ISO Country code	ISO Alpha-3 Country Code	ISO_Country_code	Three-letter uppercase alphabet	
	ISO Country number	ISO numeric country code	ISO_Country_no	Three digits number	
	Country	Name of country	Country	Uppercase alphabet	"-"
	Local Level 1	Local administrative division name of each level	L_level_1		
	Local Level 2		L_level_2		
	Local Level 3		L_level_3		
	Local Level 4		L_level_4		
	Local Level 5		L_level_5		
	Local Level 6		L_level_6		
	Borehole No. in the project	Borehole ID used in each project	Bore_no	Half-width alphanumerical text	"-"
	Registered Borehole No.	Production well number registered with relevant agency	Reg_bore_no	Half-width alphanumerical text	"-"
	Latitude	Latitude or longitude of well or village	Lat	4 digits after the decimal point in degrees Minus (-) notation for south latitude and west longitude	"-"
	Longitude		Long		
	Altitude	Altitude of well or village	Altitude	Integer	"-"
	UTM Zone	Borehole or village coordinates in UTM coordinate system	UTM_Zone	Half-width alphanumerical text	"-"
	UTM X		UTM_X	Integer	
	UTM Y		UTM_Y		
	Coordinate Collected point	Drilling point or village	Coordinate_point	Half-width alphanumerical text	"-"
	Accuracy	Value according to the accuracy of latitude and longitude	Lat_long_accuracy	Integer in m unit	"-"
	Map	Link to map image	Map_link	"IMAGE" with relative hyperlink function	"-"
Borehole Information	Positive or Negative Borehole	Successful or failed well	Success_fail_well	"Success" or "Fail"	"Unknown" in case of unsure
	Reason for Negative	Reason for failure	Reason_negative	Half-width alphanumerical text	"-" for successful well, "Unknown" if the reason for failure is unknown
	Positive or Negative Quality	Whether the water quality meets the standard	WQ_positive/negative	"Pass" or "Fail" or "Possible with condition"	"-"in case of dry well or no water quality data
	Remarks	Information on artesian well or with	Remarks	Half-width alphanumerical text	Blank if there is no information to describe

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			Item	Content	Field Name	Notation	Notation when data is unknown or not existing
				iron removal device, etc.			
			New construction / Rehabilitation	New construction well or rehabilitation well	New/rehabili	"New Construction" or "Rehabilitation"	"Unknown" in case of unsure
	Geophysical Survey		Present/Absent	Presence or absence of geophysical survey data	Gs_present /absent	"Present" or "Absent"	╱
			Survey Data	Link to geophysical survey image	Gs_image _link	"IMAGE" with relative hyperlink function	"-"
			Survey No.	ID number of geophysical survey	Gs_survey_no	Half-width alphanumerical text	╱
			Drilling Date	Starting date of drilling	Drill_date	"dd/mmm/yyyy" MS Excel format	"Unknown" in case of unsure
	Finishing drilling borehole		Bit Type	Bit type of finishing drilling hole such as DTH, Tricone, etc.	Bit_type	Half-width alphanumerical text	"Unknown" in case of unsure
			Drilling Diameter	Diameter of finishing drilling	Drill_dia	Number with unit (inches, rarely with m)	"Unknown" in case of unsure
			Drilling Liquid	Drilling liquid of finishing drilling	Drill_liquid	Half-width alphanumerical text	"Unknown" in case of unsure
			Drilled Depth	Drilled depth	Drill_depth	One digit after the decimal point in m	"Unknown" in case of unsure
			Drilling Rate	Presence or absence of drilling rate in geological column image	Drill_rate	"Present" or "Absent"	╱
			Water Strike Depth or Mud Water Lost Depth	Presence or absence of depth of water strike or water lost in geological column image	Water_strike_ depth	"Present" or "Absent"	"Absent" for dry well
			Water Yield by Air Lifting	Discharge by airlift while developing borehole	Yield_air_lift	One digit after the decimal point in m3/h	"-" for dry well, "Unknown" in case of unsure
			Acceptable Yield or not	Whether the discharge is acceptable or not	Yield_accept_ not	"Pass" or "Fail"	"Unknown" in case of unsure
	Casing		Installation	Whether casing was installed or not	Case_install	"Installed" or "Not Installed"	"Unknown" in case of unsure
			Material	Material of casing	Case_material	Half-width alphanumerical text	"-" for not installed, "Unknown" in case of unsure
			Diameter Size	Outer diameter of casing	Case_dia	Number with unit (inches, rarely with m)	"-" for not installed, "Unknown" in case of unsure
			Installed Depth	Installed depth of casing	Case_depth	One digit after the decimal point in m	"-" for not installed, "Unknown" in case of unsure
		Top Screen	Top	From the top to the bottom, the top and bottom of the	Scr_1_top	One digit after the decimal point in m	"-" for no screen, "Unknown" in
			Bottom		Scr_1_bottom		
			Top		Scr_2_top		

				Content	Field Name	Notation	Notation when data is unknown or not existing
		2nd Screen	Bottom	screen, their respective positions (depths)	Scr_2_bottom		case of unsure depth
		3rd Screen	Top		Scr_3_top		
			Bottom		Scr_3_bottom		
		4th Screen	Top		Scr_4_top		
			Bottom		Scr_4_bottom		
		5th Screen	Top		Scr_5_top		
			Bottom		Scr_5_bottom		
		6th Screen	Top		Scr_6_top		
			Bottom		Scr_6_bottom		
		7th Screen	Top		Scr_7_top		
			Bottom		Scr_7_bottom		
		8th Screen	Top		Scr_8_top		
			Bottom		Scr_8_bottom		
		9th Screen	Top		Scr_9_top		
			Bottom		Scr_9_bottom		
		10th Screen	Top		Scr_10_top		
			Bottom		Scr_10_bottom		
		11th Screen	Top		Scr_11_top		
			Bottom		Scr_11_bottom		
		Total Screen Length		Sum of the lengths of the screens	Scr_total_length	One digit after the decimal point in m	0.0 for no screen, "Unknown" in case of unsure length
		Geological Column		Presence or absence of glaciological column	Geo_co_present/absent	"Present" or "Absent"	
	Borehole logging	Logging data		Presence or absence of logging image in glaciological column image	Log_present /absent	"Present" or "Absent"	
		Item 1		Logging parameter such as "Resistivity", "SP", "Gamma" etc.	Log_name_1	Half-width alphanumerical text	"-"
		Item 2			Log_name_2		
		Item 3			Log_name_3		
		Item 4			Log_name_4		
	Water Level Measurement	Measurement Level		Water level measurement reference such as "Ground Level", "Casing Top", "Super Structure"	Measur_level	Alphanumerical text	"Unknown" for unsure reference
		Height from Ground Level		Height from ground to measurement reference	Height_from_ground	Two digits after the decimal point in m	"Unknown" for unsure reference
		Natural water level		Static water level	WL_natural	Two digits after the decimal point in m	"-" for dry well, "-" for unsure level and "@" for artesian well
		Column Image		Link to geological column image	Column_image_link	"IMAGE" with relative hyperlink function	"-"
Pu m		Test Starting Date		Starting date of pumping test	Pt_date	"dd/mmm/yyyy" MS Excel format	"-" for no pumping test,

			Item	Content	Field Name	Notation	Notation when data is unknown or not existing
							"Unknown" for unsure date
	Step Draw Down Test	1st step	Discharging Rate	Discharge of 1st step draw-down pumping test	Pt_1_discharge	Two digits after the decimal point in m3/h	"-" for no pumping test, "Unknown" for unsure measurement data
			Pumping Time	Pumping time of 1st step draw-down pumping test	Pt_1_time	Integer in minutes	
			Dynamic Water Level	Dynamic water level of 1st step draw-down pumping test	Pt_1_dd_wl	Two digits after the decimal point in m	
		2nd step	Discharging Rate	Measurement data of the second and subsequent stages of pumping test	Pt_2_discharge	Same as above	Same as above
			Pumping Time		Pt_2_time		
			Dynamic Water Level		Pt_2_dd_wl		
		3rd step	Discharging Rate		Pt_3_discharge		
			Pumping Time		Pt_3_time		
			Dynamic Water Level		Pt_3_dd_wl		
		4th step	Discharging Rate		Pt_4_discharge		
			Pumping Time		Pt_4_time		
			Dynamic Water Level		Pt_4_dd_wl		
		5th step	Discharging Rate		Pt_5_discharge		
			Pumping Time		Pt_5_time		
			Dynamic Water Level		Pt_5_dd_wl		
		6th step	Discharging Rate		Pt_6_discharge		
			Pumping Time		Pt_6_time		
			Dynamic Water Level		Pt_6_dd_wl		
		7th step	Discharging Rate		Pt_7_discharge		
			Pumping Time		Pt_7_time		
			Dynamic Water Level		Pt_7_dd_wl		
		8th step	Discharging Rate		Pt_68discharge		
			Pumping Time		Pt_8_time		
			Dynamic Water Level		Pt_8_dd_wl		
		9th step	Discharging Rate		Pt_9_discharge		

Item				Content	Field Name	Notation	Notation when data is unknown or not existing
			Pumping Time		Pt_9_time		
			Dynamic Water Level		Pt_9_dd_wl		
	Constant Rate Test		Starting Water Level	Water level when pumping test started	Pt_c_s_wl	Two digits after the decimal point in m	Same as above
			Discharging Rate	Same as step draw-down pumping test	Pt_c_discharge	Same as step draw-down pumping test	Same as step draw-down pumping test
			Pumping Time		Pt_c_time		
			Draw Down Level		Pt_c_dd_wl		
			Specific Capacity	Specific capacity of continuous pumping test	Pt_c_s_c	Two digits after the decimal point in m3/h/m	"-" for unsure
	Recovery Test		Measurement Time	Period of recovery test	Pt_r_time	Same as continuous pumping test	Same as continuous pumping test
			Recovered Water Level	Water level just after recovery test	Pt_r_wl		
	Pumping Test Analysis		Transmissibility	Transmissibility coefficient of continuous pumping test	Pt_c_transm	Exponential form with two decimal places in m2/min	"-" for no pumping test
			Permeability	Permeability coefficient of continuous pumping test	Pt_c_perme	Exponential form with two decimal places in cm/sec	"-" for no pumping test
			Transmissibility	Transmissibility coefficient of recovery test	Pt_r_transm	Exponential form with two decimal places in m2/min	"-" for no pumping test
			Permeability	Permeability coefficient of recovery test	Pt_r_perme	Exponential form with two decimal places in cm/sec	"-" for no pumping test
	Analyzed Data			Presence or absence of pumping test image	Pt_image_present/absent	"Present" or "Absent"	
	Pump Test Image			Link to pumping test image	Pt_image_link	"IMAGE" with relative hyperlink function	"-"
Pump	Type			Type of pump such as "Hand or foot pump", "Submersible"	Pump_type	Alphanumerical text	"-" for no pump installation, "Unknown" for unsure pump type
	Model			Model of pump	Pump_model	Alphanumerical text	"-" for no pump installation, "Unknown" for unsure pump model
	Specification			Specification of pump, such as its diameter	Pump_dia	Alphanumerical text	"-" for no pump installation, "Unknown" for unsure pump specification
	Installed Depth			Installation depth of pump	Pump_depth	One digits after the decimal point in m	"-" for no pump installation, "Unknown" for unsure pump depth

	Item	Content	Field Name	Notation	Notation when data is unknown or not existing
Facility	Platform	Presence or absence of platform of well	Platform	"Present" or "Absent"	"Unknown" for unsure
	Constructional Purpose	Purpose of well	Level_1 /level_2	Alphanumerical text	"-" for negative well
	Holder	Holder of well	Holder_well	Alphanumerical text	"Unknown" for unsure owner
	Image	Link to photo of facility	Photo_link	"IMAGE" with relative hyperlink function	"-"

1.3.2. Parameters for Water Quality

The Borehole Information Sheet also stores water quality data of boreholes. The water quality parameters, data notations (sign / number), field names and units of the water quality parameters are shown in Table 1-3.

Table 1-3 Items for Water Quality

Item		Sign / Number	Field Name	Unit	Number of digits after the decimal point
Data Present or not		"Present" or "Absent"	WQ_present/absent		
Color	UCV	Sign	S-Clr_UCV		
		Number	Clr_UCV	UCV	0
Color mgPt/l	mgPt/l	Sign	S-Clr_Pt		
		Number	Clr_Pt	mg/L	1
Turbidity	NTU	Sign	S-Turbidity		
		Number	Turbidity	NTU	0
Odor		Text	Odor		
Taste		Text	Taste		
Temperature		Number	Temperature	°C	1
pH		Number	pH		1
Oxidation-reduction Potential	ORP	Number	ORP	mV	0
Conductivity		Number	Conductivity	mS/m	0
Total Dissolved Solid	TDS	Sign	S-TDS		
		Number	TDS	mg/L	0
Total Hardness	TH	Sign	S-T_Hard		
		Number	T_Hard		0
Aluminum	Al	Sign	S-Al		
		Number	Al	mg/L	2
Ammonium	NH_4	Sign	S-NH4		
		Number	NH4	mg/L	2
Iron	Fe	Sign	S-Fe		
		Number	Fe	mg/L	2
Fluoride	F	Sign	S-F		
		Number	F	mg/L	1
Manganese	Mn	Sign	S-Mn		
		Number	Mn	mg/L	2
Nitrate	NO_3	Sign	S-NO3		
		Number	NO3	mg/L	1
Nitrite	NO_2	Sign	S-NO2		

Item		Sign / Number	Field Name	Unit	Number of digits after the decimal point
		Number	NO2	mg/L	2
Dissolved Oxygen	DO	Sign	S-DO		
		Number	DO	mg/L	1
Phosphorus	P	Sign	S-P		
		Number	P	mg/L	2
Phosphate	PO_4^{3-}	Sign	S-PO4		
		Number	PO4	mg/L	2
Sodium	Na	Sign	S-Na		
		Number	Na	mg/L	1
Zinc	Zn	Sign	S-Zn		
		Number	Zn	mg/L	1
Calcium	Ca	Sign	S-Ca		
		Number	Ca	mg/L	0
Magnesium	Mg	Sign	S-Mg		
		Number	Mg	mg/L	0
Potassium	K	Sign	S-K		
		Number	K	mg/L	1
Bicarbonates	HCO_3^-	Sign	S-HCO3		
		Number	HCO3	mg/L	0
Carbonate	CO_3^-	Sign	S-CO3		
		Number	CO3	mg/L	1
Chloride	Cl-	Sign	S-Cl		
		Number	Cl	mg/L	0
Sulfate	SO_4^{2-}	Sign	S-SO4		
		Number	SO4	mg/L	0
Alkalinity		Sign	S- Alkalinity		
		Number	Alkalinity	mg/L	0
TAC		Number	TAC	French Degree	0
Lead	Pb	Sign	S-Pb		
		Number	Pb	mg/L	3
Palladium	Pd	Sign	S-Pd		
		Number	Pd	mg/L	3
Mercury	Hg	Sign	S-Hg		
		Number	Hg	mg/L	4
Selenium	Se	Sign	S-Se		
		Number	Se	mg/L	3
Arsenic	As	Sign	S-As		
		Number	As	mg/L	3
Boron	B	Sign	S-B		
		Number	B	mg/L	2
Cadmium	Cd	Sign	S-Cd		
		Number	Cd	mg/L	3
Copper	Cu	Sign	S-Cu		
		Number	Cu	mg/L	2
Chromium	Cr	Sign	S-Cr		
		Number	Cr	mg/L	2
Sexivalent Chromium	Cr_6^+	Sign	S-Cr6		
		Number	Cr6	mg/L	3
General Bacteria		Sign	S-Gen_bacteria		
		Number	Gen_bacteria	/100mL	0
Total Coliform		Sign	S-T_coli		

Item		Sign / Number	Field Name	Unit	Number of digits after the decimal point
		Number	T_Coli	/100mL	0
Facal Coliform		Sign	S-F-coli		
		Number	F-coli	/100mL	0

1.3.3. Information items for project

The Borehole Information Sheet also stores the information related to each project: Items of such   information are shown in Table 1-4. Those information is also stored in the Project Information Sheet.

Table 1-4   Information items for project

Item		Content
Project Information	Project_ID	Project ID
	Project Name	Name of project
	Consultant	Name of consultant
	Contractor	Name of contractor
	Year Submitted Report	Year when report was submitted.
	Construction Works Started	Date when construction works started.
	Construction Works Finished	Date construction works finished.
	Drilled Boreholes	Number of drilled boreholes
	Positive Boreholes	Number of positive boreholes
	Negative Boreholes	Number of negative boreholes
	Q'ty of Negative Yield	Number of negative yield boreholes
	Q'ty of Negative quality	Number of negative water quality boreholes
	Q'ty of Boreholes the reason for rejection is not knowable	Number of boreholes whose reason for rejection is not knowable.
	Success Rate	Success Rate (%)
	Q'ty of Rehabilitation	Number of rehabilitated boreholes
	Remarks	Remarks
	Year of finalization	Year of the construction completion. If the construction completion year is unknown, the project report submission year is used, and if it is unknown, the E / N year is used.
Registration record of dataset	Date of registration	Date of registration
	Project/Work Name	Project/Work Name
	Project/Work Name	Project/Work Name

1.3.4. Information about updated information

In the Borehole Information Sheet, information of one (1) borehole is principally in one (1) raw of the sheet. After the information is stored in the Borehole Dataset, if additional information in the same borehole is obtained, such data is entered in the Update Information Sheet. This is the case when a pumping test, water quality analysis, borehole rehabilitation, etc. are newly performed after the borehole is constructed. The items on the Update Information Sheet are the same as the Borehole Information Sheet but a link is added to access the data on the Borehole Information Sheet for the same borehole. In order to show explicitly the updating date of registration, project/work name and executing agency/organization are entered in the Borehole Information Sheet as the history of the record.

1.3.5. Local administrative division of each country

The local administrative divisions of borehole locations are shown as local levels 1 to 6 in the Borehole Information Sheet. Since names of local administrative divisions, such as "region" or "district" differ from country to country, names used in each country are shown in the Local Administrative Division Sheet as shown in Table 1-5. In case that the name is changed after construction, it is recorded separately for each period as shown in Table 1-5.

Table 1-5　Item of Local Administrative Division Sheet

Administrative division ID	Local administrative divisions							
	Country	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Period
L_BFA01	BURKINA FASO	Region	Province	Department/ Commune	Village	Site name	—	—
L_CIV01	COTE D'IVOR	District	Region	Department	Sub-prefecture	Commune /Regional council	Village	—
L_ETH01	ETHIOPIA	Region	Zone	Districts (woreda)	Kebeles ("neighborhoods").	Village	Site name	—
L_KEN01	KENYA	County	Sub-County	Ward	Village	-	-	After 2013
L_KEN02	KENYA	County	District	Division	Location	Sub Location	Village	Before 2013

2. Utilization of Borehole dataset

2.1. Preparation for analysis _ Focal point of data copy

For utilizing Borehole Dataset such as processing and analysis of data, it is recommended create a copy of data on another files or folders in order to avoid unexpected data loss or overwriting on the data.

(1) Copying of the whole Excel book files of the dataset

In case that the copy of the dataset file is created in the same folder oh which hierarchy is same as the Image Data Folders, hyperlinks to the Image Data Folders input on the dataset are effectively work. However, if the copy of the dataset file is saved in another folder of the Image Data Folders, hyperlinks would not work (Refer to 2.3).

(2) Copying of only certain Excel sheet of the dataset

In case of coping the whole sheet to new sheet, it should be noted if merged cells are remaining.

When coping a certain sheet by using "sheet tab" respectively, it should be assured to place a check mark on the check box "Create a copy" as shown in Figure 2-1. If it is not checked, the original sheet would move to another sheet.

Right click on sheet tab and select "Move or Copy"

Open the window, place check mark on "Create a copy"

Select "New book" from pulldown menu of "To book", then new book would be created.
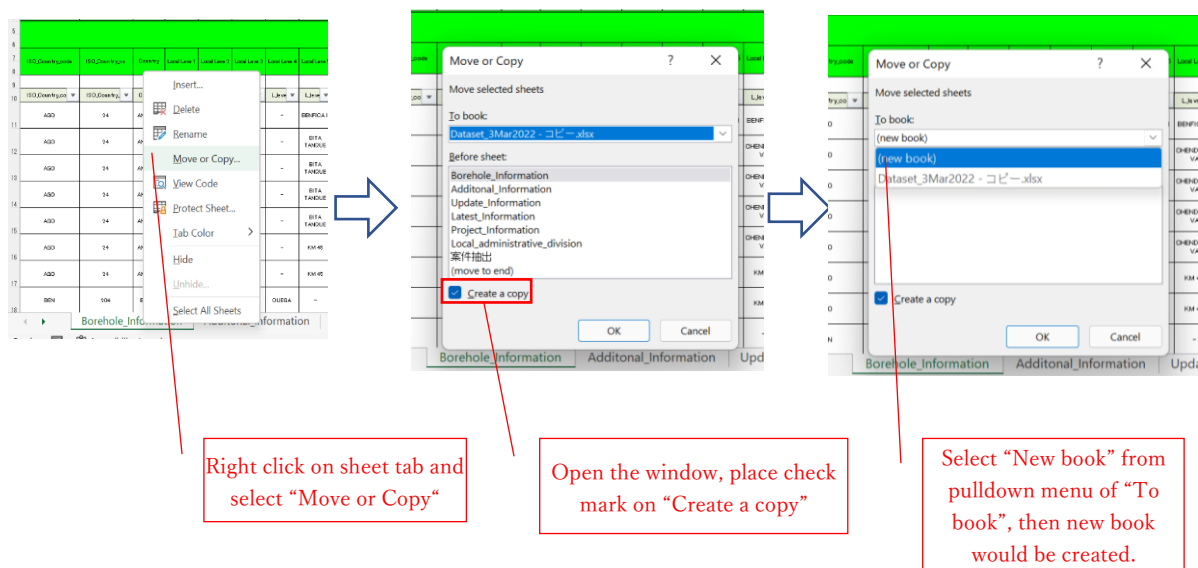
Figure 2-1   Attention of coping with sheet tab

(3) In case of copying of a certain part of sheet

It should be kept in mind that those data value and name of item are not out of alignment on the Excel sheet when it is pasted.

2.2. How to use Filter function

The dataset is handled on the Excel sheet. On the Excel sheet, boreholes are lined up in the row direction and name of item are in the column direction. In the process of data, shortened item names are placed for easily handling. The shortened item names are called "Field Name" (Refer to Figure 2-2).

Figure 2-2　Structure of dataset sheet and field name

By using filter function, narrowing down of data becomes available. How to active the filter function is described below.

① Setting filter function

Open the Borehole Information Sheet and select the area including "field name" and data.

Click "Data" tab and select "Filter", then ▽symbol appears as shown in Figure 2-3.
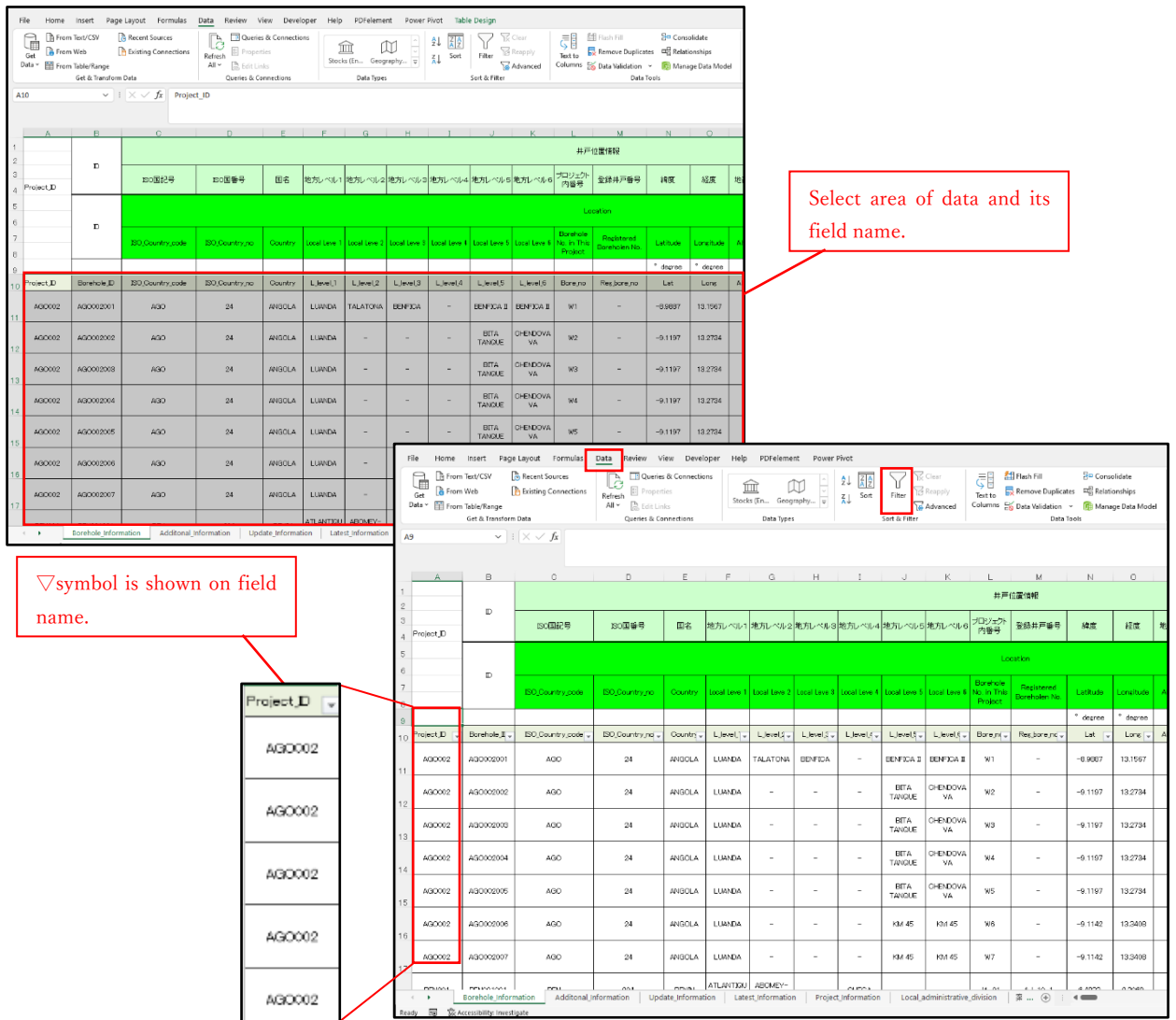
Figure 2-3　Setting filter function

② Narrowing down data with filter function

When click the symbol "▽", pulldown of all registered data appear (Figure 2-3). If one (1) data in the pulldown is checked, only clicked data is shown and unchecked data is hide.

For example, to show only success borehole in Uganda, check mark to "Uganda" from field name of "Country" and select "Success" from "Success_fail_borehole" (Figure 2-4).
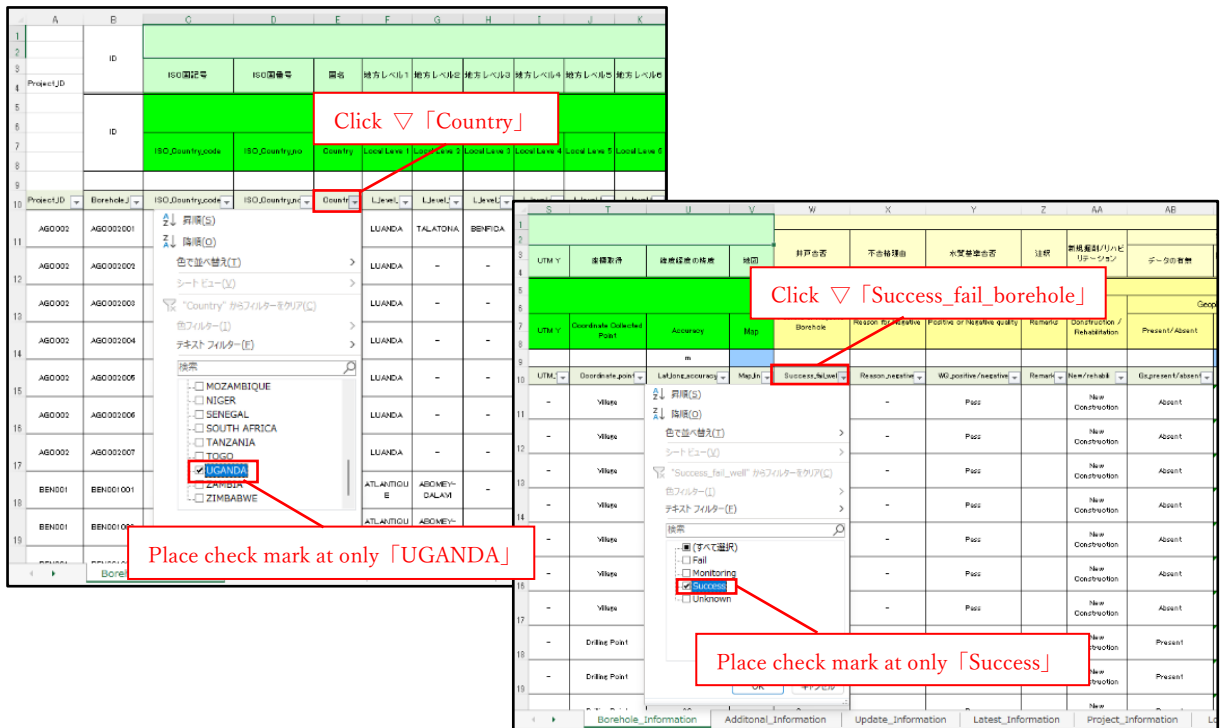
Figure 2-4　Example of data extract with filter function

③　Clare the narrowing down

In order to clear the narrowed down, click on "Clear" as shown in Figure 2-5. By this process, only narrowed result is cleared and filter function is being kept.
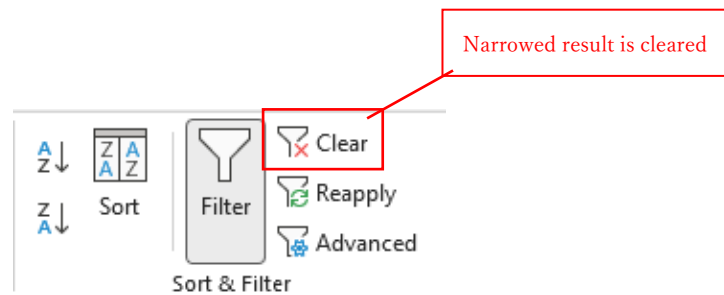
Figure 2-5　Clear narrowing down

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2.3. Hyperlink of image data

In the dataset, image data of map, geology column, physical test image, pump test image and photo are registered if those data exist and available. Click on "IMAGE" then the pdf file of image data appears (Figure 2-6).

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Figure 2-6　Open image file on the dataset

The image files mentioned above are saved in the same folders as the folder in which the dataset files are saved. Careful attention should be paid to following issue: If any change is made on folder hierarchy and/or name of folders and files, the hyperlink would not work. Refer to Figure 2-7.
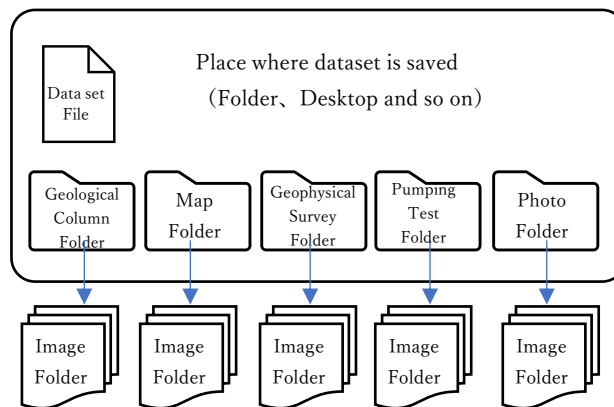
Figure 2-7　Folder hierarchy of dataset file and image file

2.4. Function of pivot table

By using function of pivot table, information registered in dataset is shown as table, chart and graph in order to utilize data analysis.

① Creating table

Click on "Insert" tab and "Table", then select data area for creating pivot table. Data area shall

include field name on the top row and place check mark on "My table has headers" as shown in Figure 2-8.
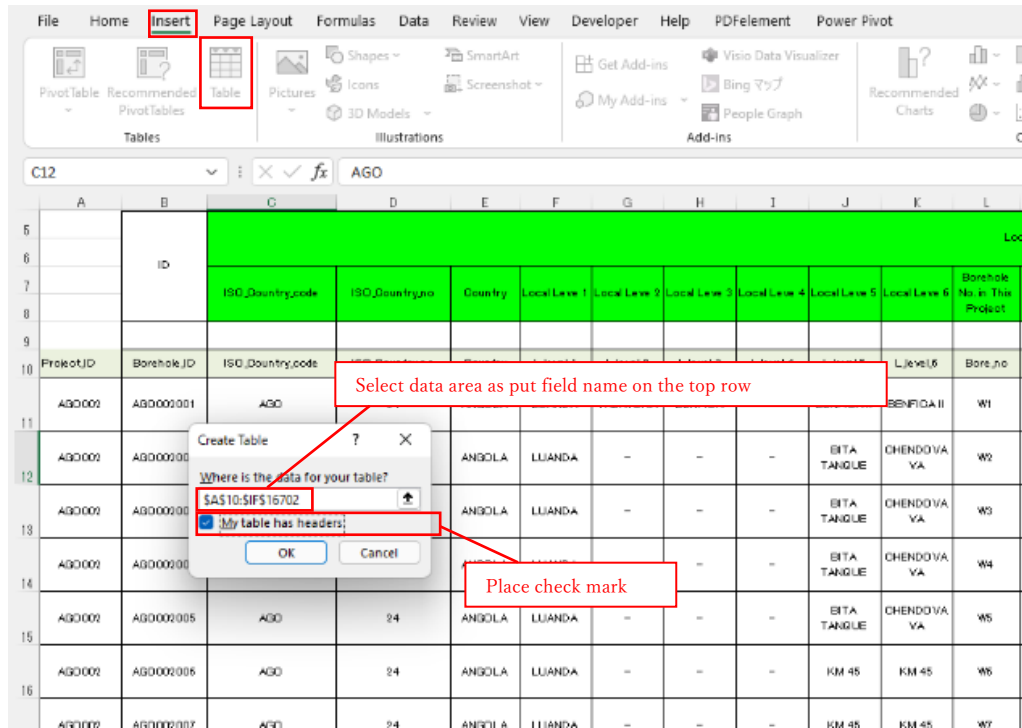
Figure 2-8　Select area of table

Click "Table design" tab and name the table name on the bar. For example, let put "Source_tb" as the table name (Figure 2-9).
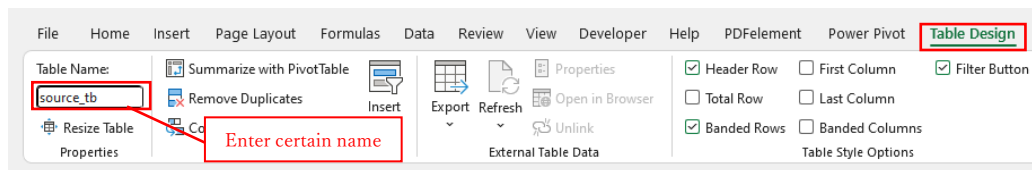
Figure 2-9　Setting of table name

② Creating pivot table

Click on "Insert" tab and "Pivot Table", then input the name of table on the bar "Table/Range". Choose "New worksheet" for placing pivot table (Figure 2-10).
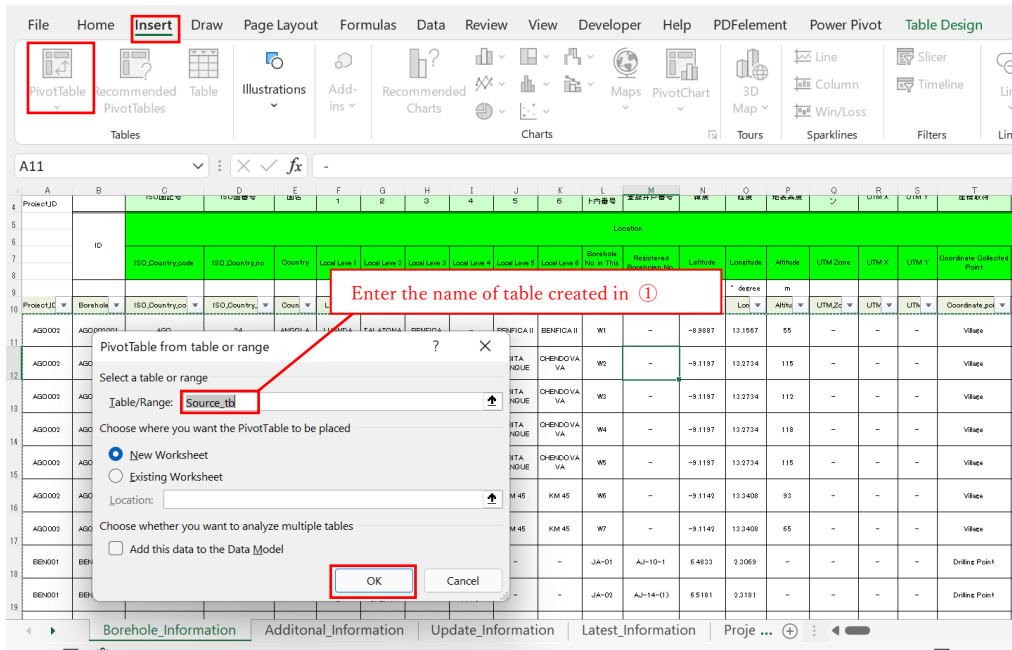
Figure 2-10   Creating pivot table

③   Creating aggregate table with pivot table

In order to create a table, select the target item of the pivot table. For example, to aggregate the number of boreholes in a country, enter "Country" into "Rows" and "Values", then the aggregate table is created: The numbers of borehole in the countries are shown.
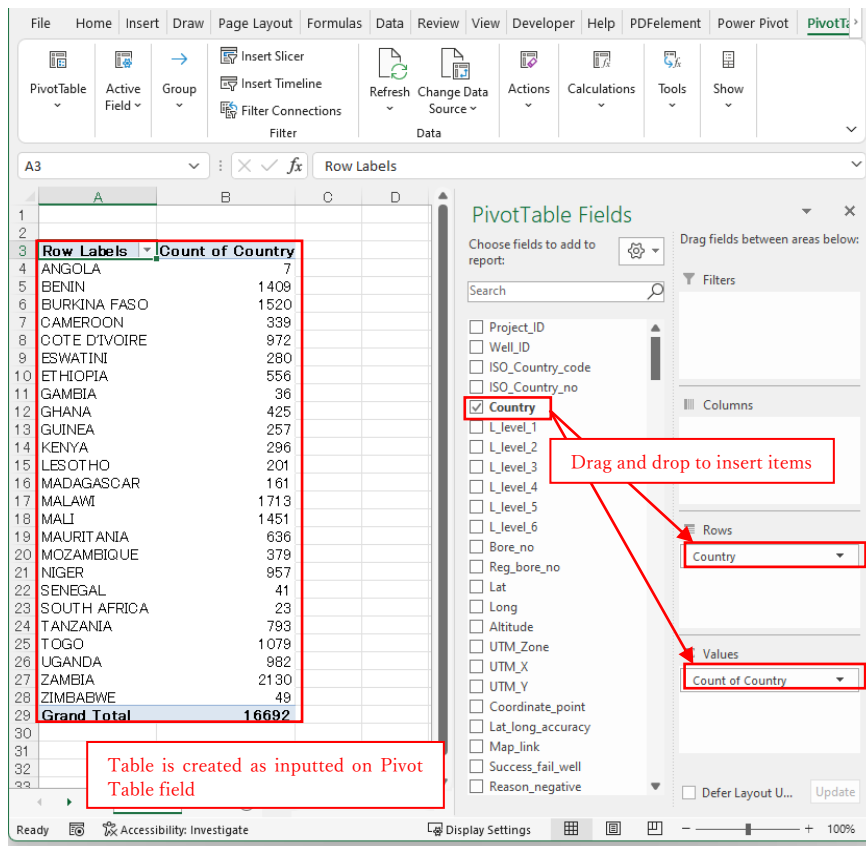
Figure 2-11 Creating aggregate table with pivot table

④ Creating graph with pivot table

In order to create a graph from the aggregate table set in ③ above, click any cell inside of the aggregate table, "Pivot Table Analyze" tab and "Pivot Graph" (Figure 2-12). Select the type of the graph in "Insert Graph" window and click "OK", then the graph is created (Figure 2-13).
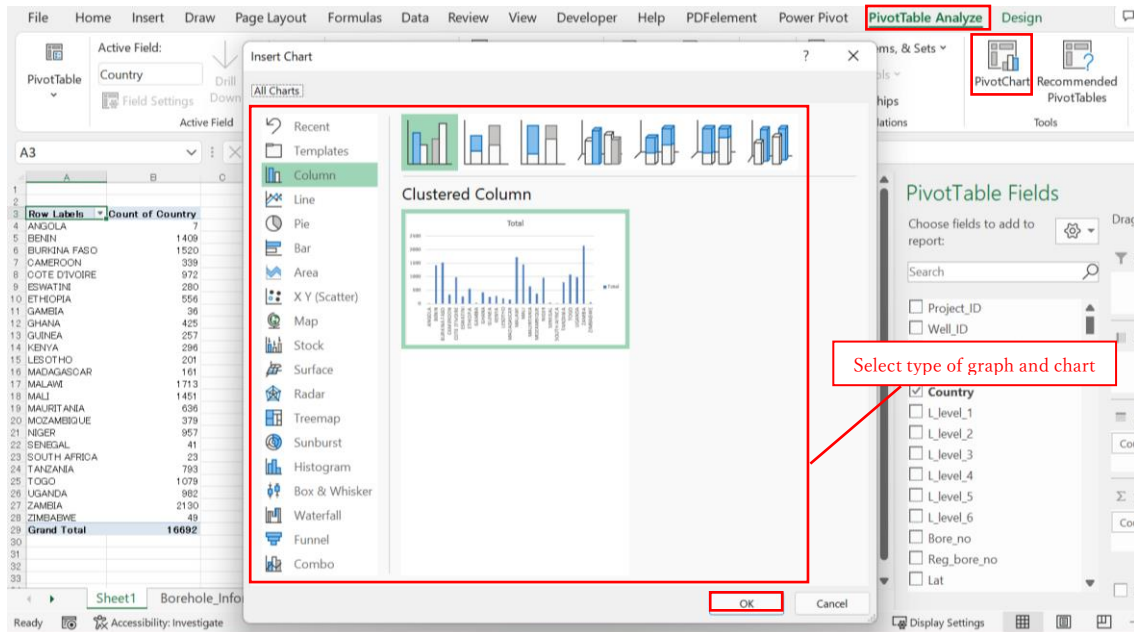
Figure 2-12　Creating graph with pivot table
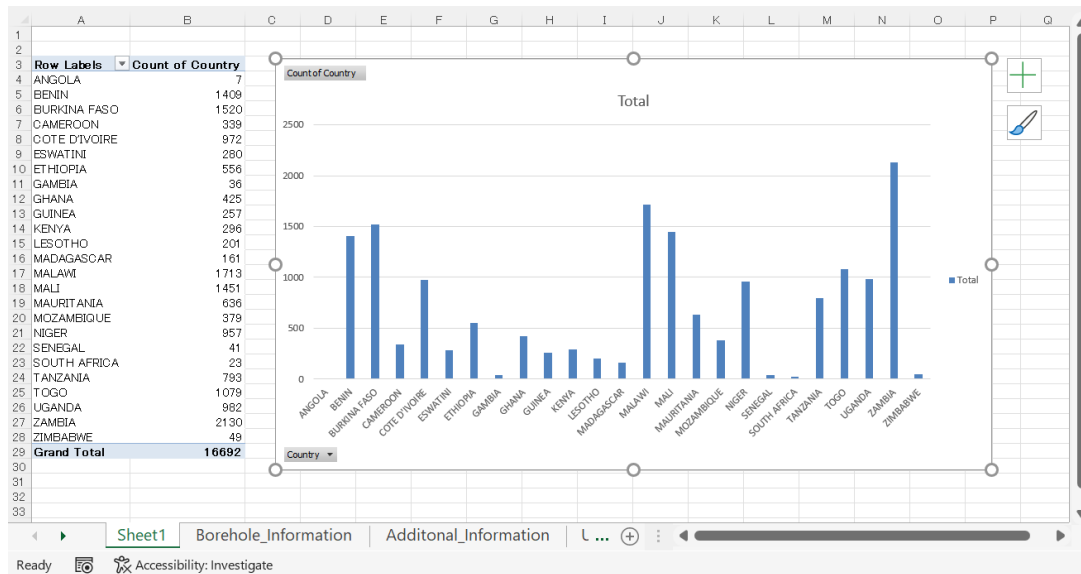
Figure 2-13　Example of created graph

2.5.　Integrate updated information into old information

The Update Information Sheet includes only data of boreholes which were surveyed at the site directly. Even though those borehole information such as coordinates and local administrative division are revised, Borehole Information Sheet is not allowed to be overwritten except for new registration of data of newly drilled boreholes. Therefore, to reflect update information into Borehole Information Sheet, it is required to create a new sheet to integrate them.

The Latest Information Sheet is revised information of Borehole Information Sheet about coordinates and local administrative division overwritten by excerpting from the Update Information Sheet. Additionally, the Latest Information Sheet includes new information related to current pump model, functionality of handpump or submersible pump. Therefore, the current situation of boreholes are confirmed by the Latest Information Sheet.

Regarding the method to reflect the latest information is highly recommended be improved depending on the purpose of utilization.

2.6. Import into GIS (Geo Information System)

In the borehole dataset, borehole coordinates are registered with world geodetic system 1984 (WGS 84). Therefore, it is possible to plot borehole locations on a map by converting from the Excel file into the CSV file and inputting into GIS. The method for input data into GIS is stated below. Here, explanation is made using QGIS as a GIS software.

① Data converting to CSV file

The name of data items must be stated on the top row of the sheet in the CSV file to load by QGIS. Data would not be loaded properly if the top row cells are merged or blank. The field name works as item name. Open the sheet which is going to be plotted and remove redundant rows upper than field name and make the field name on the top row of the sheet (Figure 2-14).

Figure 2-14　Remove redundant row to convert to CSV file

Save as "CSV UTF-8(Comma delimited)" as shown in Figure 2-15.
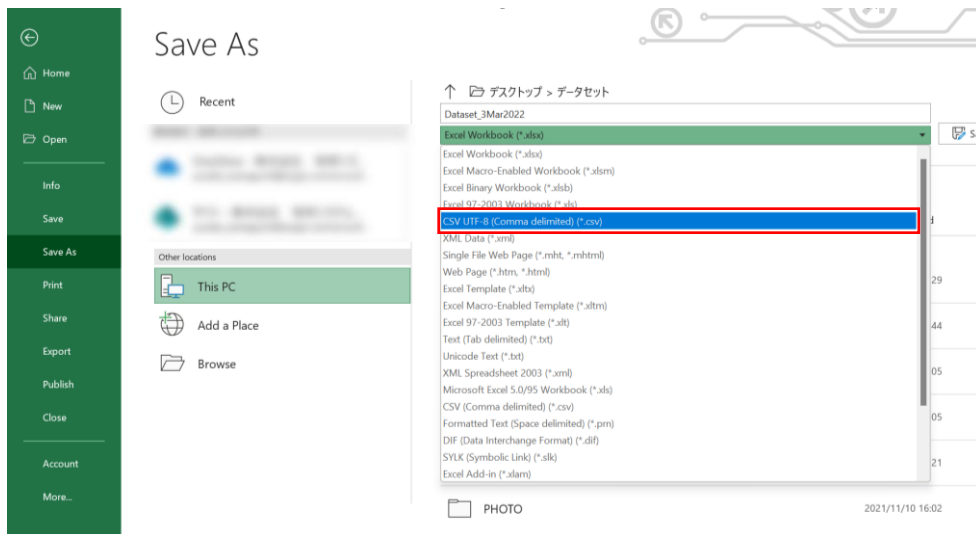
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Figure 2-15　Converting into CSV file

② Plotting point data with QGIS

Open QGIS, select "Layer" tab, "Add Layer" and "Add Delimited Text Layer" as shown in Figure 2-16.
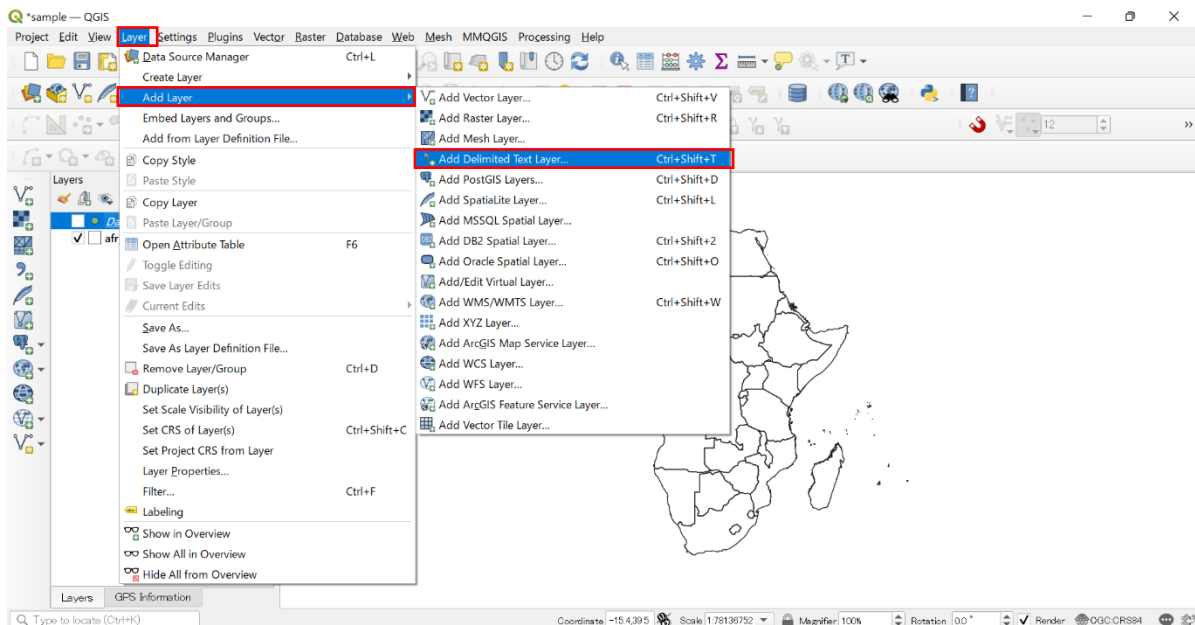

Figure 2-16　Adding CSV layer with QGIS

Select the CSV file name saved in ① above and set geometry Definition. Select the field name of Longitude and Latitude for X and Y field respectively. Then select "WGS84" in CRS, because

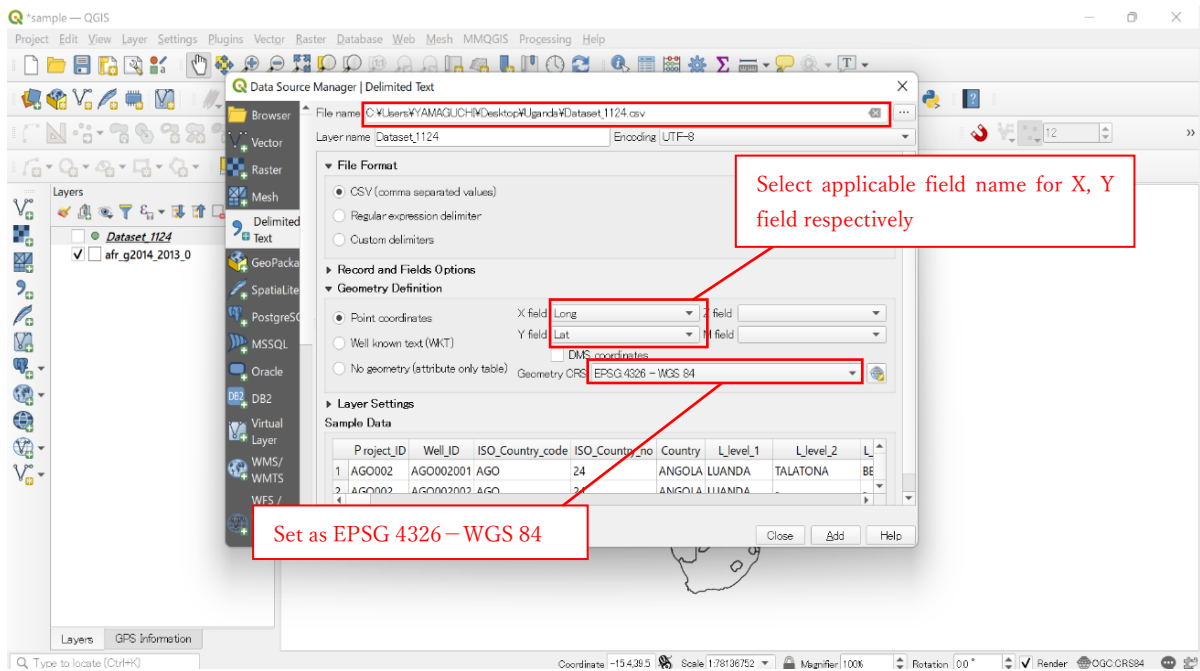geometry CRS is standardized with world geodetic system 1984 (WGS 84) (Figure 2-17).

Figure 2-17   Setting of CSV file and coordinate field

Click on "Add", then point data is plotted on the QGIS window as shown in Figure 2-18.
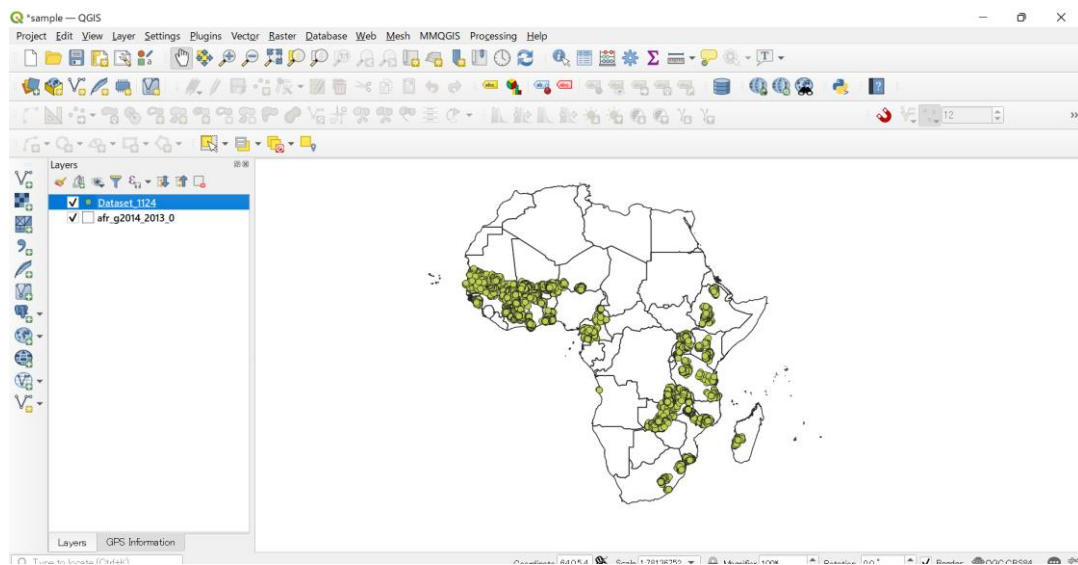

Figure 2-18   Example of Plotting on QGIS

2.7. Note on use of power query function

The Borehole Information Sheet includes approximately 17,000 borehole data. If power query function of Excel is applied on this sheet, it is going to behave worse and is not practical due to data stacking. Therefore, it is strongly recommended excerpt only needed data and separate into new several files or sheets according to data use.