

TECHNICAL NOTE  
ON THE PREPARATORY SURVEY  
ON  
THE PROJECT FOR RURAL WATER SUPPLY (PHASE IV)  
IN  
THE REPUBLIC OF THE GAMBIA

The Technical Note attached in the following pages confirms various matters discussed between Japan International Cooperation Agency (hereinafter referred to as “JICA”) Preparatory Survey Team and Department of Water Resources (hereinafter referred to as “DWR”) during the First Preparatory Survey period for the Project for Rural Water Supply (Phase IV), (hereinafter referred to as “the Project”). The Technical Note does not state final results of the Survey because it contains issues which are under considerations.

Banjul, June 19th, 2018



Kazuhiro Arita (Mr.)  
Chief Consultant / Water Supply  
Planning / Water Facility Design 1  
JICA Preparatory Survey Team



Lamin Mai Touray (Mr.)  
Director  
Department of Water Resources

## ATTACHMENT

The following items are confirmed by the Gambian side and the JICA Preparatory Survey Team (hereinafter referred to as "Survey Team") based on the results of the First Preparatory Survey.

1. Confirmation of the Requested Sites: Total Number of Sites, Village Names, Existing Boreholes, Population, Accessibility, etc

The final list of requested sites with priority order of DWR are shown in the following Table-

1. The maps of the requested target sites and existing public water facilities are shown in Annex-1,2.

Table-1. List of Requested Sites

No	Priority	Site Name	District	Region
1	23	Suma Kunda Complex	Kombo East	WCR
2	22	Faraba Sutu	Kombo East	WCR
3	19	Jalo Koto	Foni Bintang	WCR
4	20	Batabut Kantora, Sikon, Arrangallen	Foni Bintang	WCR
5	30	Dobong	Foni Kansala	WCR
6	34	Drammeh Joka	Jokardou	NBR
7	6	Kani Kunda Suba Complex	Sabaha Sanjal	NBR
8	7	Ker Sulay + Ker Ali	Upper Badibou	NBR
9	33	Sabaha Kataba Cluster	Sabaha Sanjal	NBR
10	17	Passy Chally	Upper Niumi	NBR
11	5	Lewna, Sotokoi, Ker Jatta, Wellingara Complex	Lower Niumi	NBR
12	32	Ker Jane + Ker Njugary	Jokardou	NBR
13	35	Kolior Complex	Kiang East	LRR
14	29	Jiffin	Jarra West	LRR
15	25	Buiba Mandinka + Buiba Jallow Kunda	Jarra West	LRR
16	1	Jarra Sukuta	Jarra East	LRR
17	2	Jiroff + Nema Kuta + Mandina	Kiang Central	LRR
18	3	Jahawur Mandinka + Fula	Lower Saloum	CRR
19	27	Ker Uldi + Bantanto	Upper Saloum	CRR
20	28	Gongur Tukulor + Wollof + Ganje Wollof	Lower Saloum	CRR
21	4	Ngaige Complex	Upper Saloum	CRR
22	16	Jarreng Complex	Upper Saloum	CRR
23	13	Njoben Toro Complex	Niani	CRR
24	10	Nyaga Bantang + Nyagha Bakary	Niani	CRR
25	18	Brikamanding, Darsilami, Jamwelly, Sinchu Bamba, Sinchu Magai, Sinchu Madado complex	Upper Fulladou West	CRR
26	9	Teneng Fara Complex	Niamina East	CRR
27	26	Sololo + Fuga + Dramman Complex	Fulladou West	CRR
28	8	Njoren + Sankabari Complex	Upper Fulladou West	CRR
29	11	Limbambul Yamadou + Bambo	Wulli West	URR



No	Priority	Site Name	District	Region
30	12	Kolly Bantang + Yorro Bawol + Samba Gabbudeh	Wulli West	URR
31	21	Touba Wulli	Wulli West	URR
32	24	Sotuma Kantora, Jawo Kunda, Madina Balla complex	Kantora	URR
33	31	Bani + Kantel Kunda	Kantora	URR
34	36	Simoto Touba	Tumana	URR
35	14	Perai Tenda	Tumana	URR
36	15	Samba Kunda + Badari + Ceessay Kunda	Tumana	URR

2. Confirmation of Overlapping of Project Sites with other Donors and NGOs, Cooperation Record of other Donors

(1) Existing piped water supply scheme in the target villages are identified as following table.

Table-2. List of Existing Piped Scheme

No	Village Name	Sponsored By	Service Level of the Scheme
1	Tumani Tenda	Individual	Basic level, meeting the water demand
4	Arrangallen	VDC	No access, the scheme is not functioning
6	Drammeh Joka	Sen De Gel	Inadequate level, not meeting the water demand
8	Ker Sulay	Individual	Inadequate level, not meeting the water demand
	Ker Ali	Direct Aid	Inadequate level, not meeting the water demand
12	Ker Njugary	Sen De Gel	Inadequate level, not meeting the water demand
13	Kolior Nyamala	IDB	Inadequate level, not meeting the water demand
14	Jiffin	Direct Aid	Inadequate level, not meeting the water demand
15	Buiba Mandinka	Individual	Inadequate level, not meeting the water demand
16	Jarra Sukuta	Individual	No access, the scheme is not functioning
19	Bantanto Ker Sulay	Individual	Basic level, meeting the water demand
	Bantanto Ker Uldi	Individual	No access, the scheme is not functioning
20	Gondur Wollof	IDB	Inadequate level, not meeting the water demand
21	Ngaige	IDB	Inadequate level, not meeting the water demand
	Makka Ali Sarr	Individual	Inadequate level, not meeting the water demand
23	Njoben Toro/ Wollof	Individual	Inadequate level, not meeting the water demand
	Jallow Kunda Mat	Individual	Basic level, meeting the water demand
25	Brikamanding	Individual	Inadequate level, not meeting the water demand
26	Teneng Fara	Direct Aid	Basic level, meeting the water demand
27	Sololo Mandinka	NAWEC	Non-potable purposes due to high iron content
	Sololo Fula	Individual	No access, the scheme is not functioning
29	Limbambul Yamadou	Individual	Inadequate level, not meeting the water demand
30	Kolly Bantang	Individual	No access, the scheme is not functioning

※VDC:Village Development Committee, IDB:Islamic Development Bank

Overall, the water supply systems in the above table are identified as very small, inferior quality and poorly implemented.

(2) Success Rate of Boreholes by Other Donors

The total number of borehole was 30 in surveyed 26 villages in 16 sites. Based on the water quality analysis results, the success rate is estimated as approximately 65%.

3. Confirmation of Criteria and Priorities in Selecting Sites for this Project

A list of criteria for the detailed screening and prioritization are show in the following Table-3. All requested target sites will be screened and prioritized based on the criteria.

Table-3. Criteria for Detailed Site Screening and Prioritization

Item	Criteria	Means of Verification
<b>1. Verification of the Requested Sites 【First Field Survey: Discussion with the Executing Agency】</b>		
1) Duplication with other donors' projects	There is no duplication with other donors' project(s) for construction of water supply facilities which covers the entire area of the target site.	Discussion with the executing agency
2) Necessity of security measures	The target site is not located in the areas where security is concerned.	
<b>2. First Screening 【Data Analysis after the First Field Survey】</b>		
1) Commitment of the community to make an initial deposit of O&M fund before completion of construction works	The community expresses a commitment to make an initial deposit of O&M fund (GMD25,000), which is the condition to construct piped water supply facility in the rural water supply programs in The Gambia.	First socio-economic survey (key informant interview to community leaders)
2) Commitment of the community to collect water user fee and manage O&M fund	The community expresses a commitment to collect and manage water user fee in order to cover O&M costs for water supply facilities.	
<b>3. First Prioritization 【Data Analysis after the First Field Survey】</b>		
1) Size of beneficiary population (cost-effectiveness)	To have greater beneficiary effect from the construction of water supply facilities, a higher priority is given to a site with a large population. (Population data to be obtained from the village heads and the national census)	First socio-economic survey (key informant interview to community leaders and field survey)
2) Access to safe water	A higher priority is given to a site with low proportion of people using improved drinking water sources among the population of the site.	
3) Access to the site	A higher priority is given to a site where can be accessed with large-size vehicles and a drilling rig throughout the year.	
4) Distance to existing water supply facilities	A higher priority is given to a site where an average distance from households to existing water supply facilities used for serving domestic water is long.	
5) Water quality and hydrological condition of existing water supply facilities	A higher priority is given to a site with high degree of water contamination and low groundwater table in existing water supply facilities.	On-site water quality test and Hydrological investigation



Item	Criteria	Means of Verification
6) Stable water supply from existing facilities	A higher priority is given to a site where existing facilities supply water in limited period in a day or year.	First socio-economic survey (key informant interview to community leaders and field survey)
7) O&M structure	A higher priority is given to a site where the community has a structure in charge of O&M of existing water facilities and collects water user fee.	
8) Priority given by the executing agency	Policy priority of the executing agency	Discussion with the executing agency
<b>4. Second Screening [Data Analysis after the Second Field Survey]</b>		
1) Results of pumping test	The yield of a borehole constructed in the test-drilling meets the water demand of the site.	Test-drilling investigation / water quality analysis
2) Results of water quality analysis	Water quality of a borehole constructed in the test-drilling satisfies the water quality standards.	
<b>5. Second Prioritization [Data Analysis after the Second Field Survey]</b>		
1) Size of beneficiary population (cost-effectiveness)	A higher priority is given to a site with a large population. (Population data to be adjusted from the data used in the first prioritization based on the results obtained from the second socio-economic survey)	Second socio-economic survey (village population survey)
2) Approximate costs for construction of water supply facilities (cost-effectiveness)	A higher priority is given to a site with a small construction cost to the population size.	Approximate costs based on the results obtained from the second field survey
3) Amount of willingness-to-pay of households for water user fee	A higher priority is given to a site where an average amount of willingness-to-pay of households for O&M of new water supply facilities is high.	Second socio-economic survey (household survey)
4) Amount of ability-to-pay of households for water user fee	A higher priority is given to a site where the ratio of an average amount of costs for water in an average monthly income of households is low. (to be analyzed based on estimated maintenance costs of new water supply facility.)	

4. Confirmation of Arrangement in Advance for Visiting Sites of Test Well Drilling and Geophysical Survey by the Gambian side

The Gambian side shall support the Survey Team to gain the communities' cooperation for the geophysical survey and the test drilling.

5. Confirmation of the Experiences, Advantages, Sector Policies and Availability of Sustainable Technologies related to use of Solar Pumping System and Prepaid Metering System with Pay-As-You-Go Technology (PAYG) for Rural Water Supply Facilities in The Gambia

The National Water Policy (2006) states that "a water charge in connection with the use of water for whatever purpose derived from the granting of a license and delivered through

abstraction and impounding assets, shall be levied on a volumetric basis". For community water supply facilities in rural areas which are operated and maintained by the Village Water Committees (VWCs), the policy allows VWCs to collect water charges (user fees) in accordance with their operational rules and management statutes. Based on this principle, the Policy on Management and Sustainability of Rural Water Supply Solar Pumping Systems (2008) further stipulates that water meters are installed at all outlets of piped water supply systems for management of water consumption and collection of user fees by tap stand.

DWR consider the PAYG provided by eWATER in the Gambia as advantageous to reduce friction and conflict within communities over collection and management of user fees. However, the lack of oversight or regulatory framework that provides protection to consumers is considered a disadvantage of using the technologies.

In order to improve the monitoring and maintenance efficiency of the water supply system, the possibility of introducing the pre-paid water meter technologies on a couple of sites on a trial basis will be investigated further with measures to improve the capacity of related organization and communities.

#### 6. Confirmation on Progress in Formulation of New Water Sector Legislation, Policies, and Strategies and related Institutional Restructuring

The Gambia Water Bill (2014) is under review by the Ministry of Justice along with the National Water Resources Management Authority Bill (2014) and the Gambia Meteorological Authority Bill (2014) before submission to the Cabinet and the National Assembly. Restructuring of DWR and new organizational setup of the Department are yet to be approved by the government. The organizational setup and operational procedures of the rural water supply projects will be reflected in the implementation plan of this Project in accordance with progress in legislation of these new bills and restructuring of the Department. The national policies, laws, strategies, and development programmes related to water sector in the Gambia are summarized in Annex-3.

#### 7. Confirmation on Progress in Decentralization of Service Provision Sectors to the Local Authorities

Decentralization of service provision sectors to the local authorities is still underway. The Area Councils in the six Local Government Areas where the requested sites are located are yet to





take full responsibilities in implementation and supervision of operation and maintenance of rural water supply projects. While they have started formulation of Council's Strategic Plans in consultation with the Village Development Committees (VDCs) and Ward Development Committees (WDCs), they rely on the government ministries at central and regional level technically and financially for implementation of the plans due to non-availability of staff designated to the respective service provision sectors including water supply as well as limitation of the budget which is solely raised from revenue collections.

In these circumstances, the Area Councils work closely with the government ministries through the Technical Advisory Committee (TAC) and Multidiscipline Facilitation Team (MDFT) as their "technical arms" to coordinate, mobilize, facilitate, supervise and monitor activities conducted at community level in the respective projects. This operational approach will be applied to implementation of this Project as well.

#### 8. Confirmation on Design Criteria and Implementation Structure of O&M of the Water Supply Facilities to be Constructed in this Project

##### (1) Design Criteria

##### a) Annual Growth Rate of Population

Based on The Gambia 2013 Population and Housing Census, annual growth rate of population by local government area are set as shown in the following Table-1. The target population will be estimated based on the growth rate.

Table-1. Annual Growth Rate of Population

Region	Growth Rate
North Bank	2.5%
Western	6.1%
Lower River	1.4%
Central River (North Bank)	2.3%
Central River (South Bank)	1.7%
Upper River	2.8%

##### b) Institutional Water Demands

The design water consumption for institutional water demands shall be set as shown in the following Table-2.




Table-2. Institutional Water Demand

Type	Water Demand
Clinic	5 l/visitor/d
Day Schools	5 l/std/d
Mosque	5 l/visitor

c) Physical Losses

The system will be planned and designed with a 10% allowance for physical losses.

d) Public Tap Stands

The number and location of public tap stands will be planned so that maximum number of users per tap is 100.

e) Peaking Factors

Based on eWATER’s hourly water consumption data over 16 months from February 2017 to June 2018 in Jarreng, the daily demand pattern is calculated as shown in Figure-1. Based on the demand pattern, peaking factor of 2.70 will be applied for the design of water supply system.

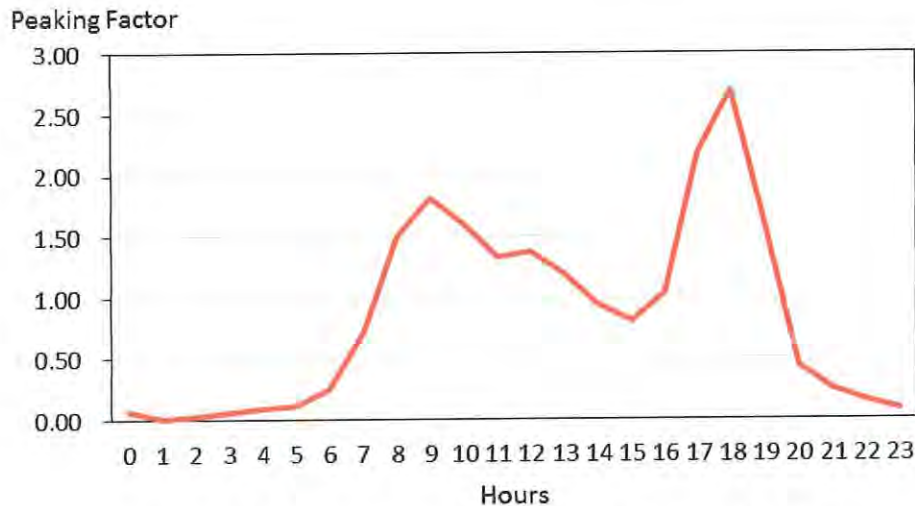


Figure-1. Daily Demand Pattern of Public Tap Stands in Jarreng

f) Tank Size

The required tank volume will be decided based on a balance of the hourly water supply pattern and hourly demand pattern.

For the daily demand pattern, information of eWATER's public tap stands in Jarreng (Figure-1) will be utilized. For the hourly water supply pattern, two scenarios, 1. National power grid





and 2. Solar power generation will be used for the analysis.

g) Existing Piped Water Supply System

If there is an existing piped water supply system at the target site, the new piped water supply system will be designed by separating from one another.

(2) O&M Structure of the Water Supply Facilities

In view of the community water supply facilities as public properties, the ownership of the facilities belong to the Government of The Gambia. The communities are empowered to manage the facilities as the owners on behalf of the government whereby the rights of the communities to use the facilities are limited to drinking water supply and expansion of the reticulation system and any other rehabilitation/ upgrade of major components of the facilities are restricted unless DWR authorizes such to the communities. The government through DWR has rights to intervene, regulate, and set standard with regard to operation and maintenance of the community water supply facilities.

Communities through VWCs are responsible for operation and maintenance of the water supply facilities including 100% cost recovery for daily operation and maintenance, and repairs of distribution pipes, taps, and solar pumping system. DWR is responsible to mobilize resources and organize rehabilitation/ replacement of major components of the facilities such as boreholes, water tanks, transmission pipes, and main distribution pipes which are beyond financial capacities of communities.

While VWCs manage the entire water supply facilities on daily basis, DWR is of the view that service providers specialized in installation and maintenance of solar pumping system should be involved in regular checkup, maintenance, and repairs of the solar modules, inverters, and pumps. Especially, the first five-year period from commencement of operation of the facilities is crucial time to keep quality of the pumping system for long-lasting use. For this reason, DWR will advise the target communities in this Project to enter into a five-year operation and maintenance contract with a solar maintenance company. Views of the communities/ VWCs in the target sites of the previous Japanese grant aid projects should also be considered and reflected in formulation of the operation and maintenance plan, especially terms and conditions of the contract with the solar maintenance company in this Project.

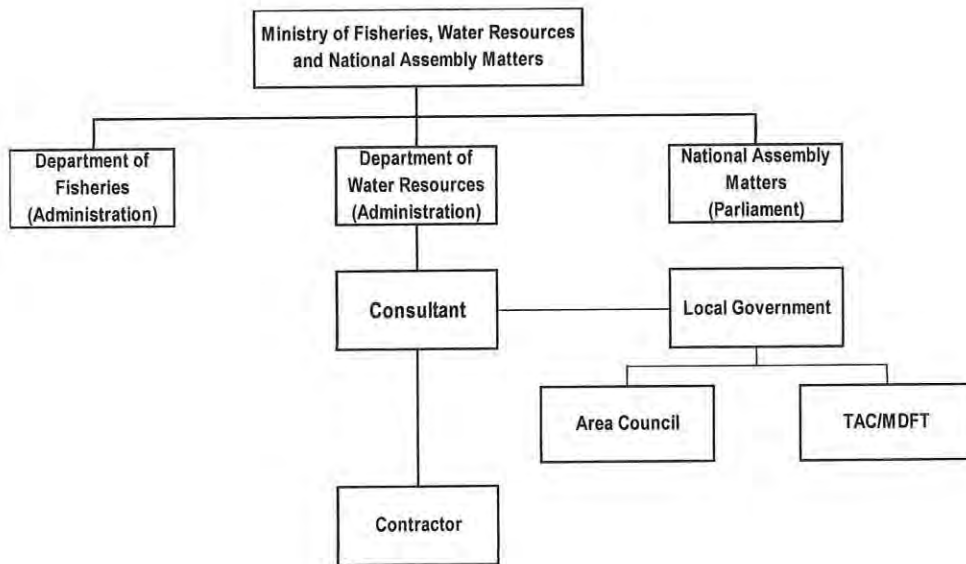
With regard to utilization of service providers, such as eWater Africa, specialized to manage the entire water facilities on behalf of the communities/ VWCs and DWR through Memorandum of

Understanding (MOU), the Government of The Gambia is yet to formulate regulations apart from the Memorandum of Understanding with eWater Africa. Considering that rural water supply should be operated out of the commercial basis, the Public Utilities Regulatory Authority (PURA) is not currently involved in regulating tariff setting of community water supply facilities or management contract between communities and service providers. It is DWR which advises lower and upper limits of user fees to communities as well as service providers and supervises fulfillment of contractual obligations by both parties.

In case that the management service contract with pre-paid metering system is introduced to some of the project sites on a trial basis, DWR will prepare Terms of Reference for the service provider to clearly stipulate its purpose, scope of services, conditions, and limitations. Based on the ToR, a management contract between the communities and service provider should govern rights and obligations of the both parties and supervisors which are DWR and the local authorities.

9. Confirmation on the Supervision and Implementation Structure for this Project

The supervision and implementation structure for this Project is shown in following figure.



DWR will be responsible for supervision and implementation of the Project. The Department will also be responsible to coordinate with the Regional Governor's Offices and Area Councils to acquire mutual cooperation with stakeholders in the respective regions.



Under the supervision of the Regional Governor's Offices and in cooperation with DWR through TAC, the Area Councils will be involved in the Project in such a way that they provide support to the Project to be implemented in their areas of jurisdiction, coordinate interventions conducted in the Local Government Area through TAC, mobilize communities and facilitate proper operation and maintenance of water facilities by VWC through MDFT, especially the motivators of DWR.

The motivators of DWR stationed in the respective regions will report to TAC on work plans related to water sector and their progress including this Project. They will also be assigned to conduct community mobilization/ sensitization, formation and training of VWCs in operation and maintenance of water facilities, and monitoring of activities to be conducted by VWCs as well as service providers. DWR and Area Councils are expected to maximize utilization of MDFT in the project implementation with budget allocation for their allowances and transport by the government of The Gambia. DWR suggests that the governor's office should coordinate and mobilize resources for activities to be conducted by MDFT.

10. Confirmation of the requested equipment and vehicles in relation to necessity, use plan, storage capacity, required types, quantity, etc.

Two 4WD vehicles are requested by DWR for the following two purposes.

- Monitoring and supervision of rural water supply system and other constructed facilities to ensuring continued use and effectiveness of the water supply system.
- Monitoring and collection of hydrogeology and water quality data

Currently, DWR has four 4WD vehicles and they are being used mainly for general administrative purpose. All of them are donated project cars and they are more than ten years old. The monitoring has been carried out at a frequency of seven days in two months using the available vehicles. DWR plans to implement the monitoring at a frequency of seven days per month using the two vehicles assigned for the monitoring purposes. It is conceivable that the monitoring and supervision ability of the DWR will be improved by two new monitoring vehicles.

The annual budget available for the O&M of vehicles is about 250,000GMD. The amount is considered sufficient to maintain six vehicles if they are effectively maintained with regular preventive maintenance.



## 11. Division of Responsibility for Test Boreholes

The test boreholes developed by the Survey Team will be handed over to the Gambian side. The Gambian side takes responsibility for maintaining and protecting the test boreholes until the start of the construction of facilities.

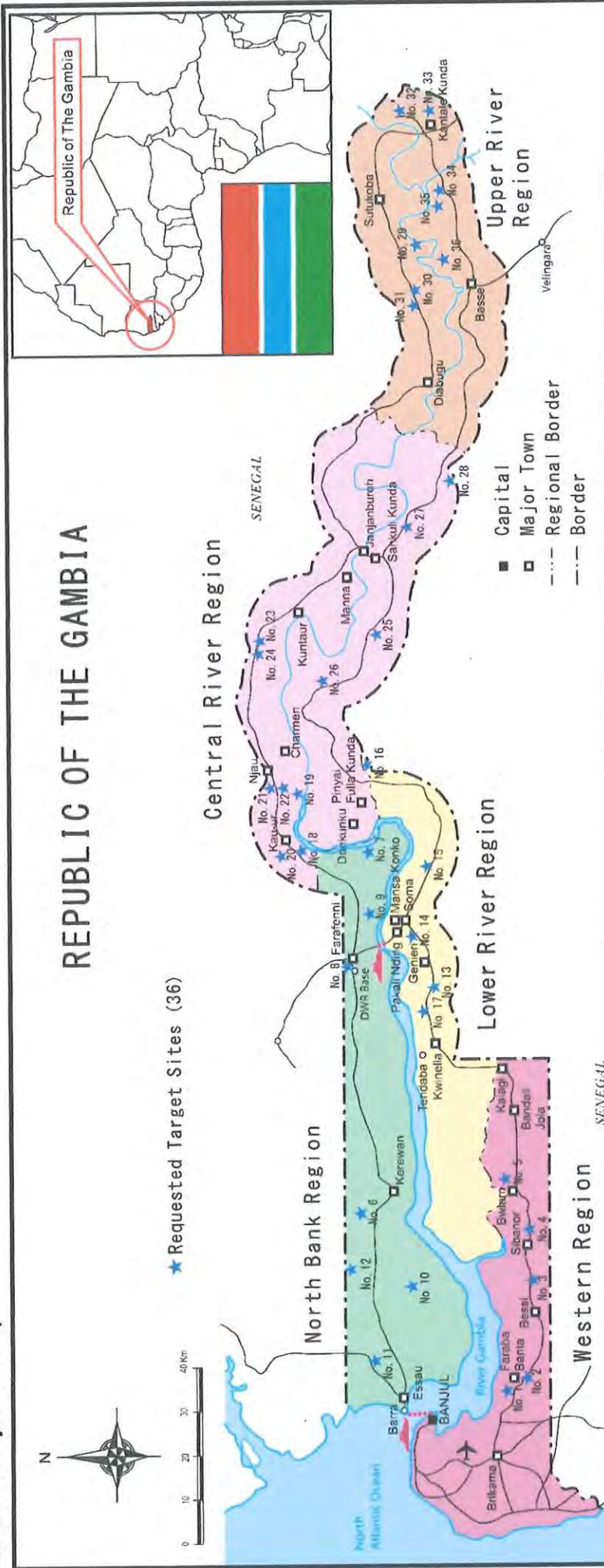
### ANNEX:

1. Project Site Map
2. Requested Target Area Maps
3. National Policies, Legislation, Strategies and Development Programmes Related to Water Sector





# REPUBLIC OF THE GAMBIA



WESTERN REGION	
Local Government Area (BRIKAMA)	
N-1	Suma Kunda Complex
N-2	Faraba Sutu
N-3	Jalo Koto
N-4	Batabut Kantora, Sikon, Arrangallen
N-5	Dobong

NORTH BANK REGION	
Local Government Area (KEREWAN)	
N-6	Drammeh Joka
N-7	Kani Kunda Suba Complex
N-8	Ker Sulay + Ker Ali
N-9	Sabaha Kataba Cluster
N-10	Passy Chally
N-11	Lewna, Sotokoi, Ker Jatta, Wellingara Complex
N-12	Ker Jane + Ker Njugary

LOWER RIVER REGION	
Local Government Area (MANSAKONKO)	
N-13	Kolior Complex
N-14	Jiffin
N-15	Buibua Mandinka+Buiba Jallow Kunda
N-16	Jarra Sukuta
N-17	Jlroff + Nema Kuta + Mandina

CENTRAL RIVER REGION	
Local Government Area (KUNT AUR)	
N-18	Jahawur Mandinka + Fula
N-19	Ker Uldi + Bantanto
N-20	Gongur Tukulor +Wollof+ Ganje Wollof
N-21	Ngaige Complex
N-22	Jarreng Complex
N-23	Njoben Toro Complex
N-24	Nyaga Bantang + Nyagha Bakary
Local Government Area (JANJANBUREH)	
N-25	Brikamanding + Darsilami + Jamwelly + Sinchu Bamba + Sinchu Magai + Sinchu Madado Complex
N-26	T eneng Fara Complex
N-27	Sololo+Fuga+Dramman Complex
N-28	Njoren + Sankabari Complex

UPPER RIVER REGION	
Local Government Area (BASSE)	
N-29	Limbambul Yamadou + Bambo
N-30	Kolly Bantang + Yorro Bawol + Samba Gabbudeh
N-31	Touba Wulli
N-32	Sotuma Kantora, Jawo Kunda + Madina Balla Complex
N-33	Bani + Kantel Kunda
N-34	Simoto T ouba
N-35	Perai T enda
N-36	Samba Kunda + Badari + Ceesay Kunda

## RURAL WATER SUPPLY PHASE IV IN THE REPUBLIC OF THE GAMBIA PROJECT SITE MAP AND SITE LIST

158  
102



ANNEX-2: Requested Target Area Maps

N-01 Suma Kunda Complex

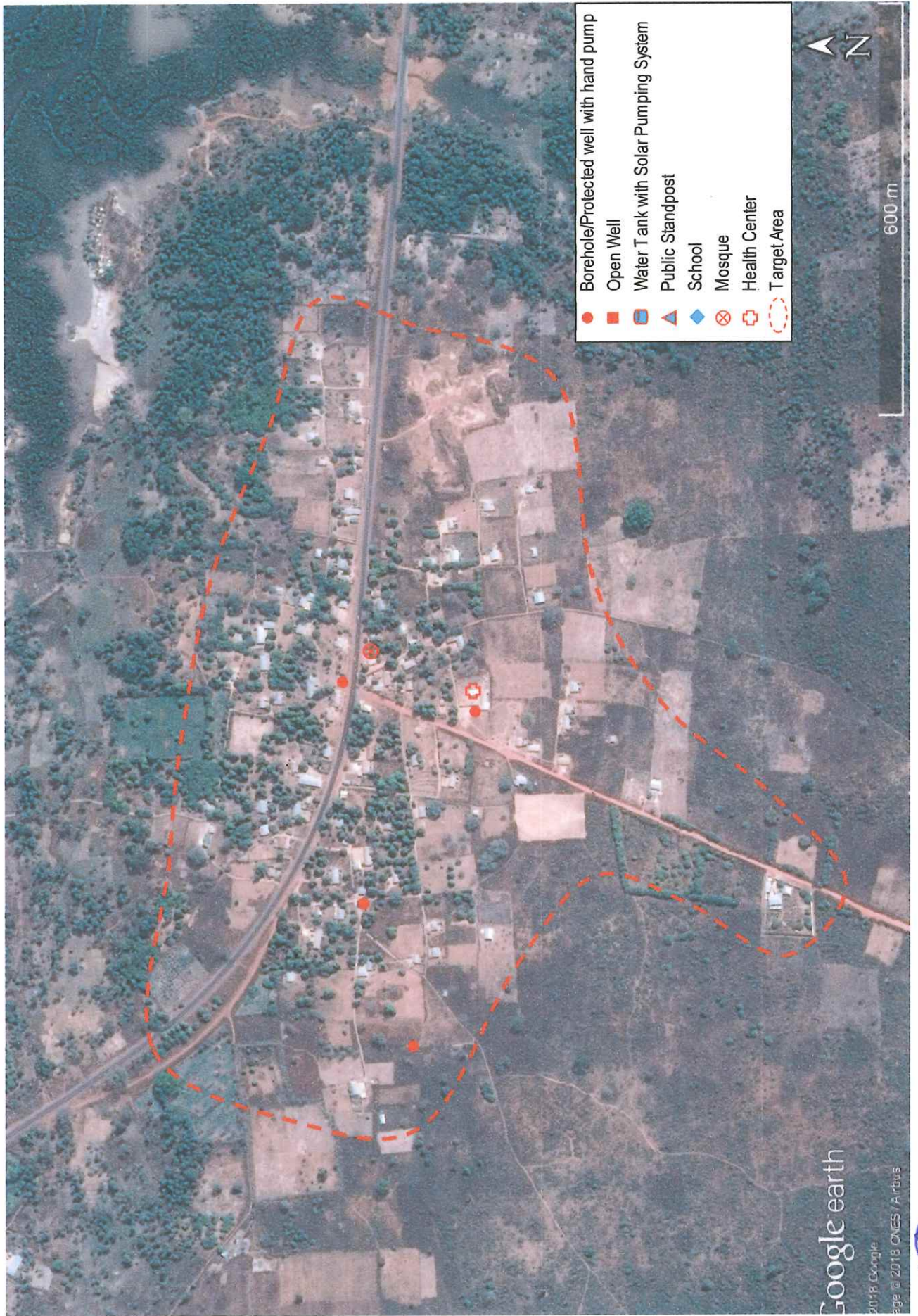


*[Handwritten signature]*  
*[Handwritten initials]*



ANNEX-2: Requested Target Area Maps

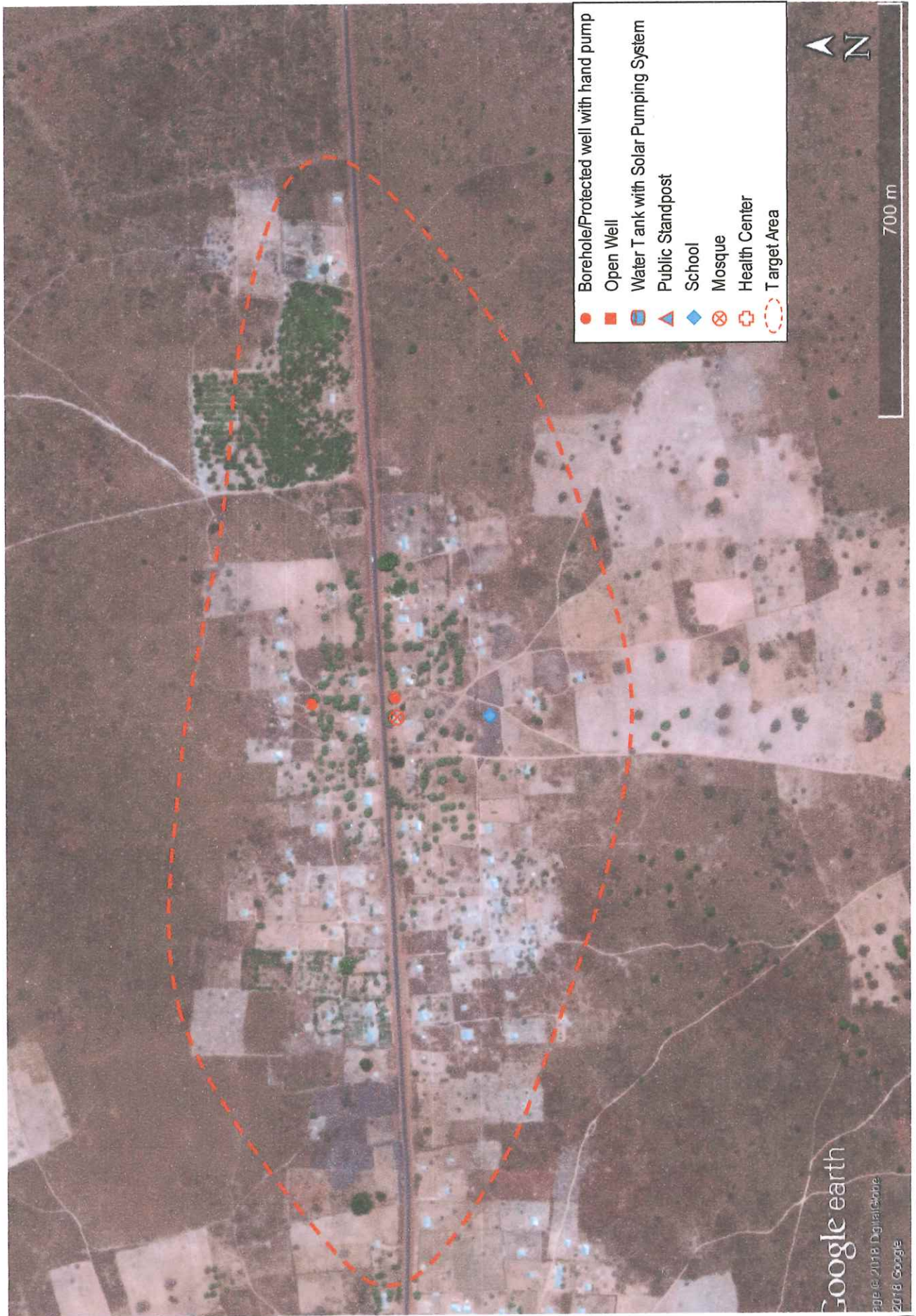
N-02 Faraba Sutu





ANNEX-2: Requested Target Area Maps

N-03 Jalo Koto



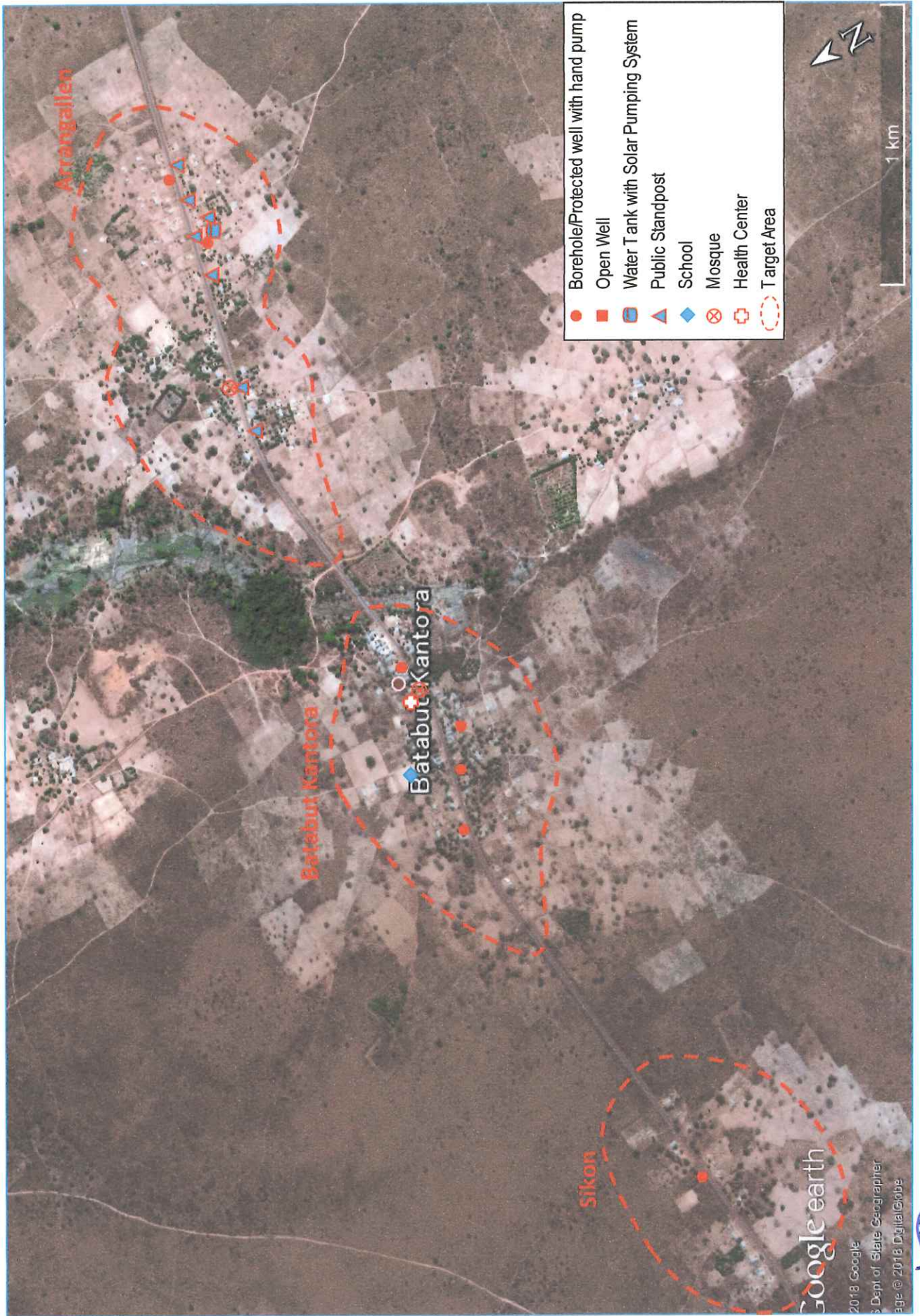
Jalo

17/18



ANNEX-2: Requested Target Area Maps

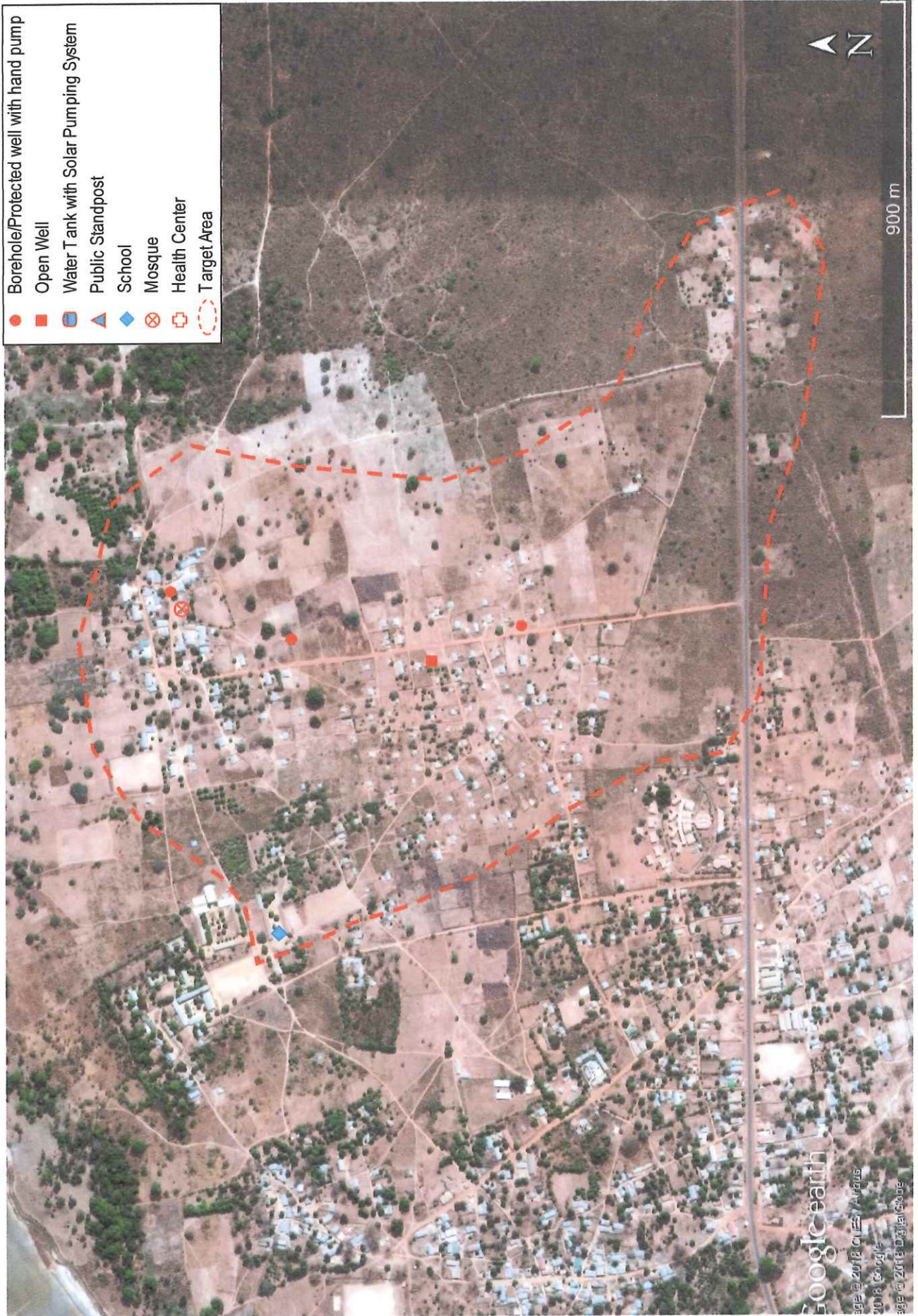
N-04 Batabut Kantora, Sikon, Arrangallen





ANNEX-2: Requested Target Area Maps

N-05 Dobong



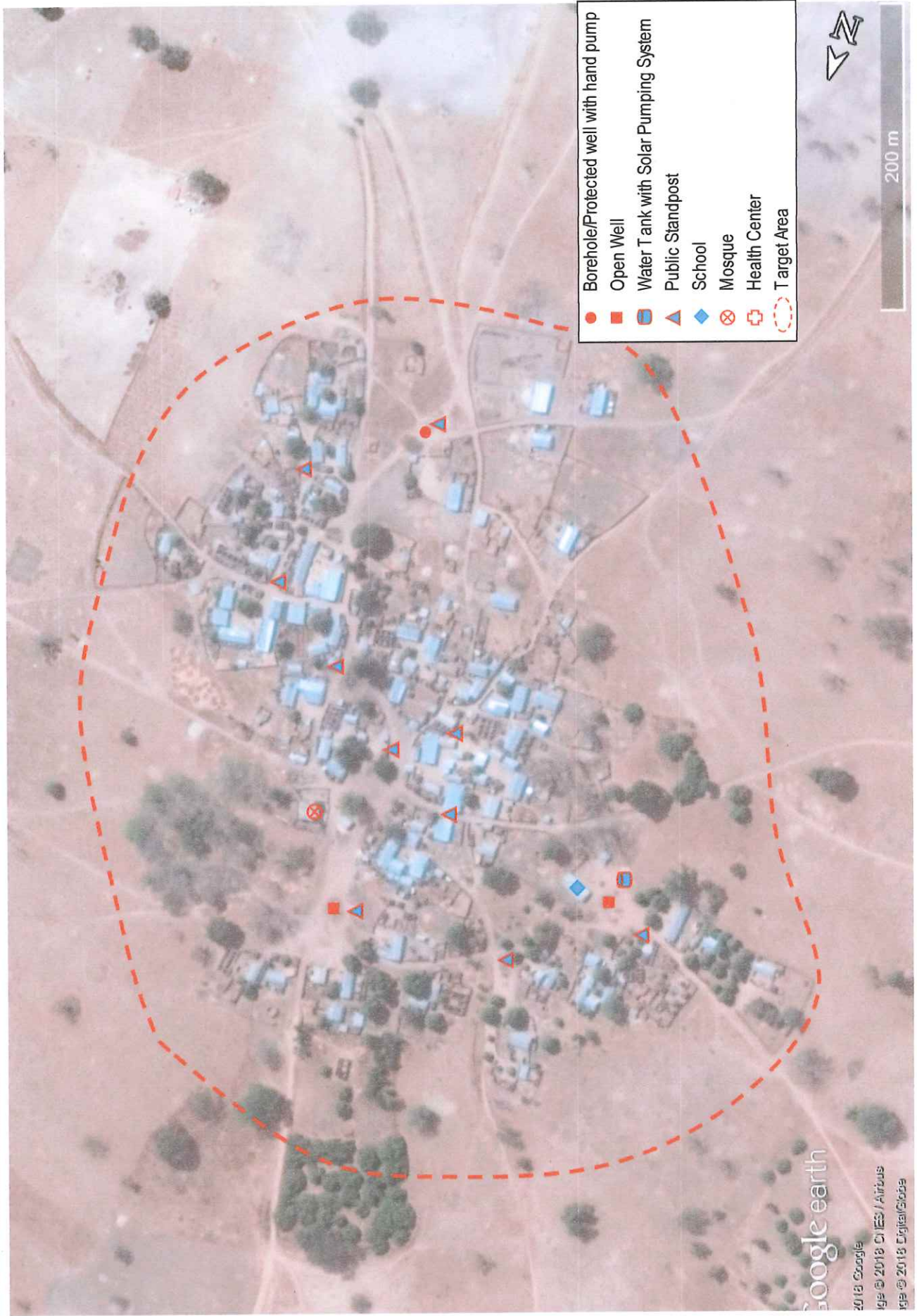
*[Handwritten signature]*

*[Handwritten symbol]*



ANNEX-2: Requested Target Area Maps

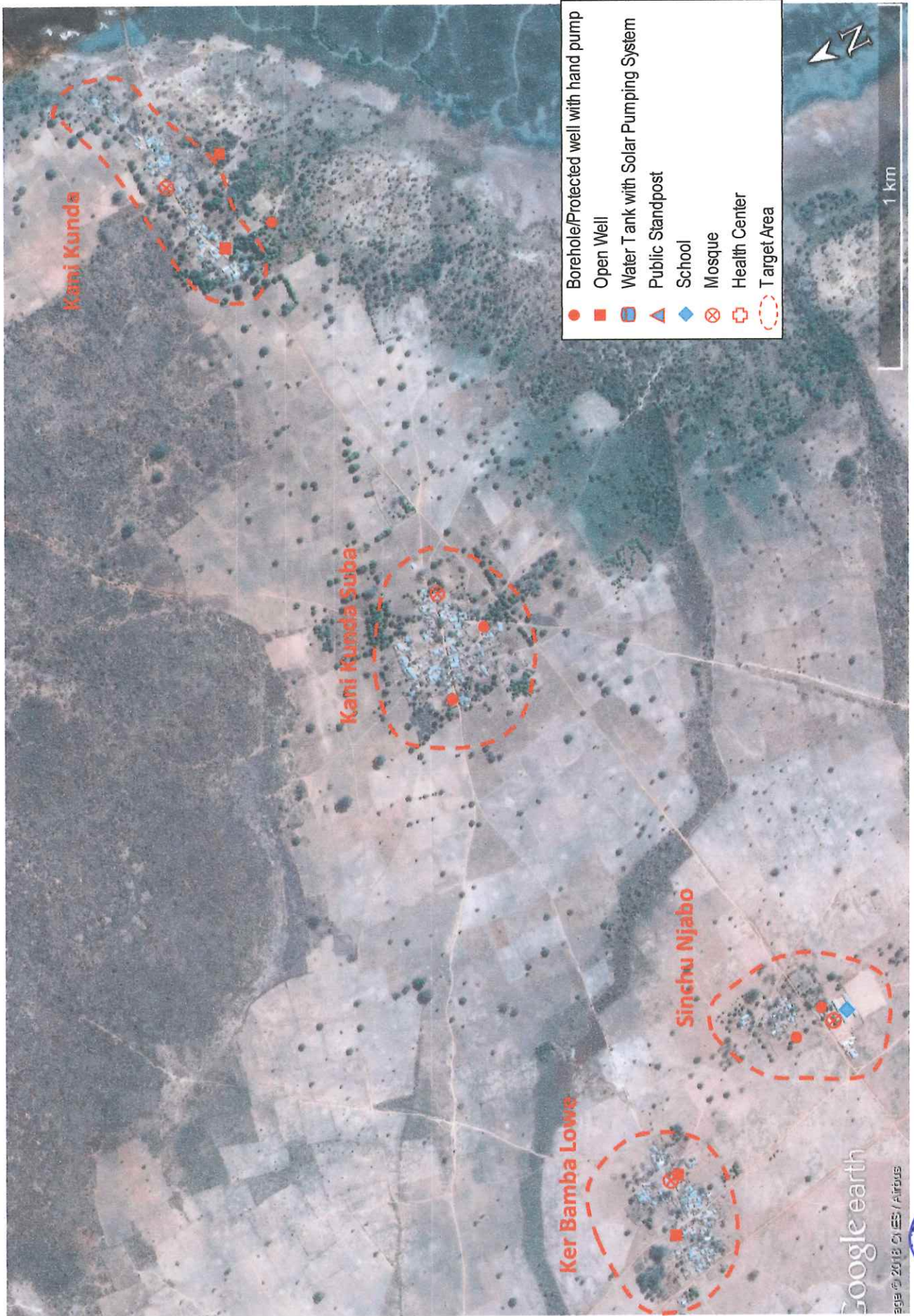
N-06 Drammeh Joka





ANNEX-2: Requested Target Area Maps

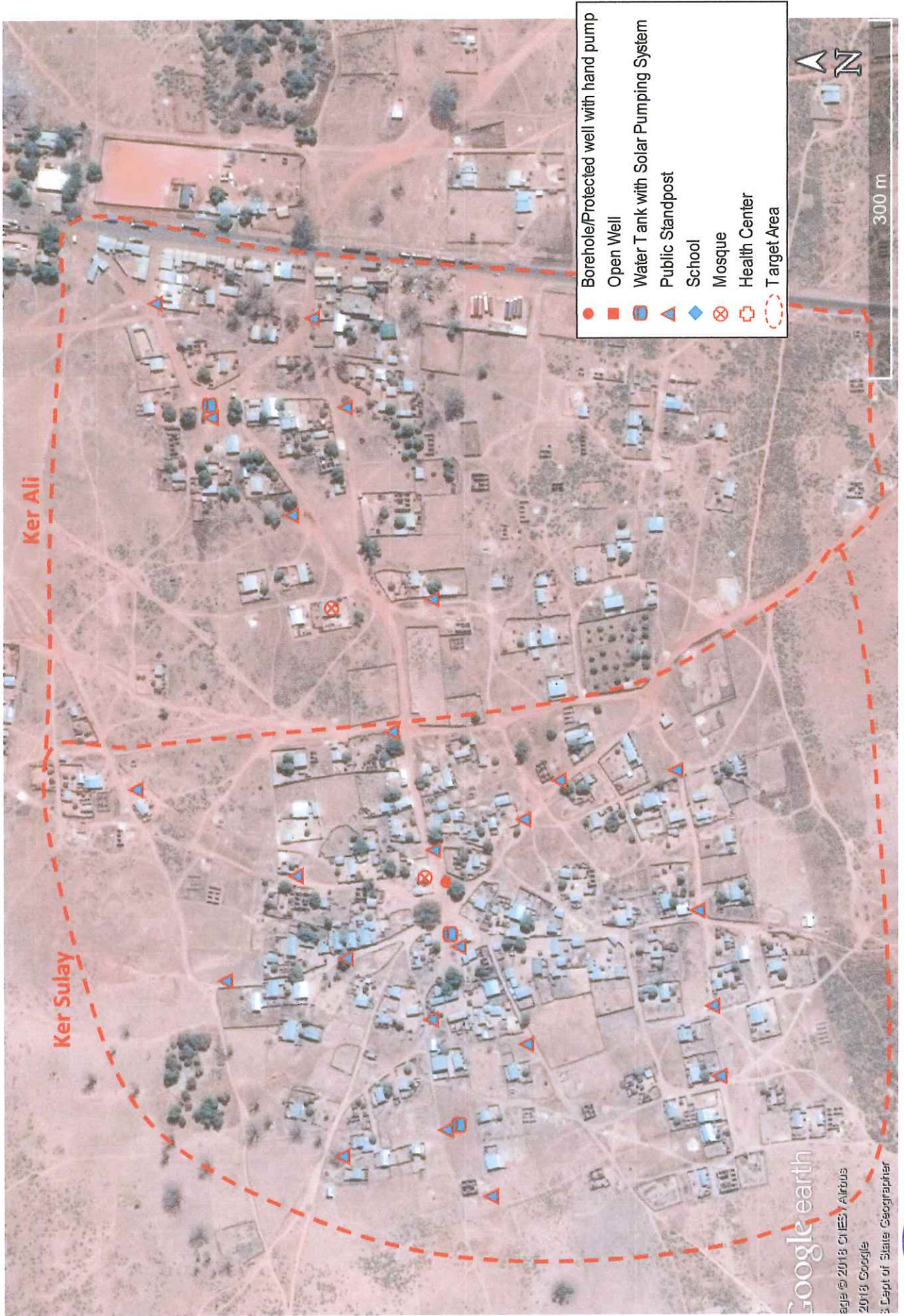
N-07 Kani Kunda Suba Complex





ANNEX-2: Requested Target Area Maps

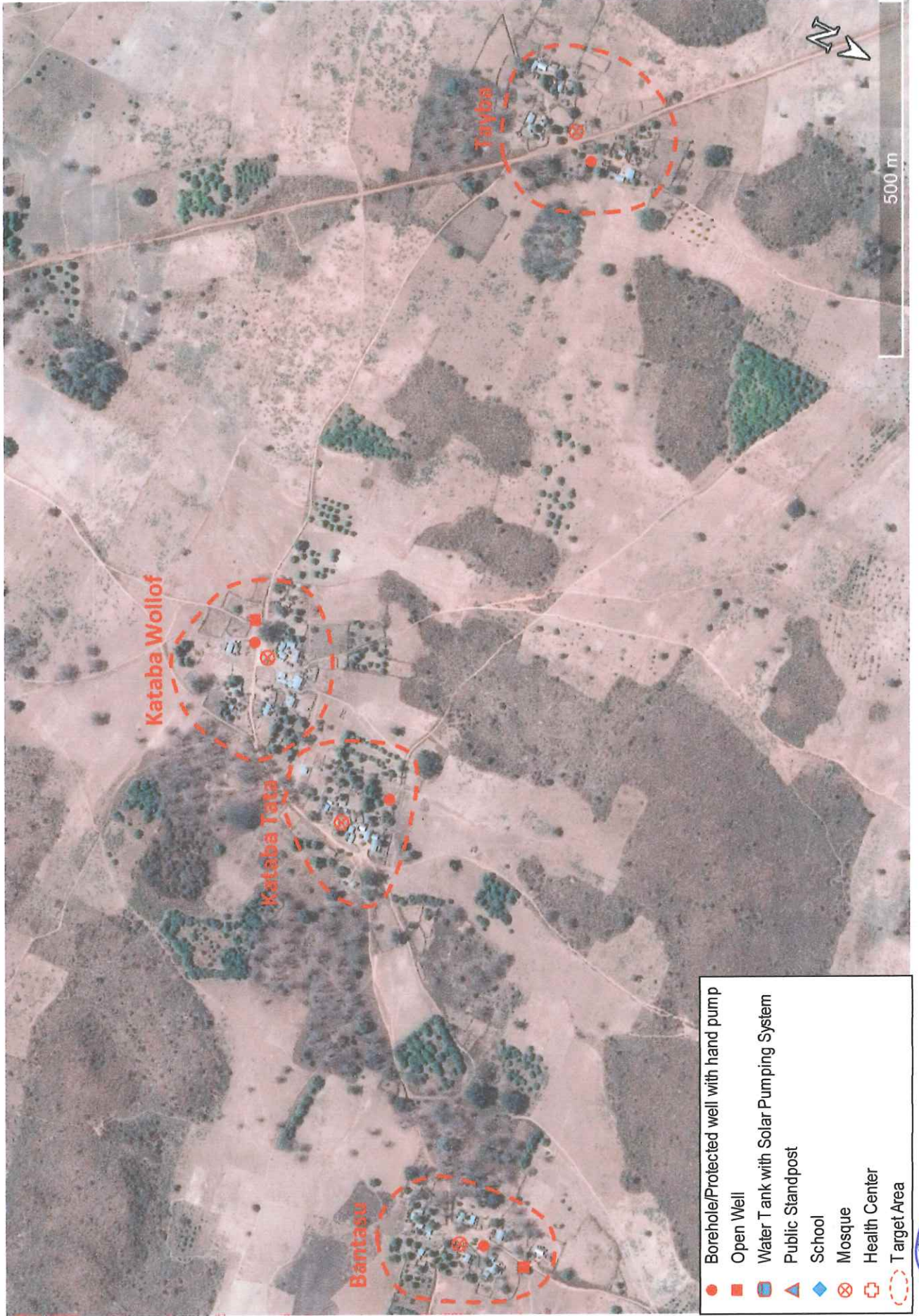
N-08 Ker Sulay + Ker Ali





ANNEX-2: Requested Target Area Maps

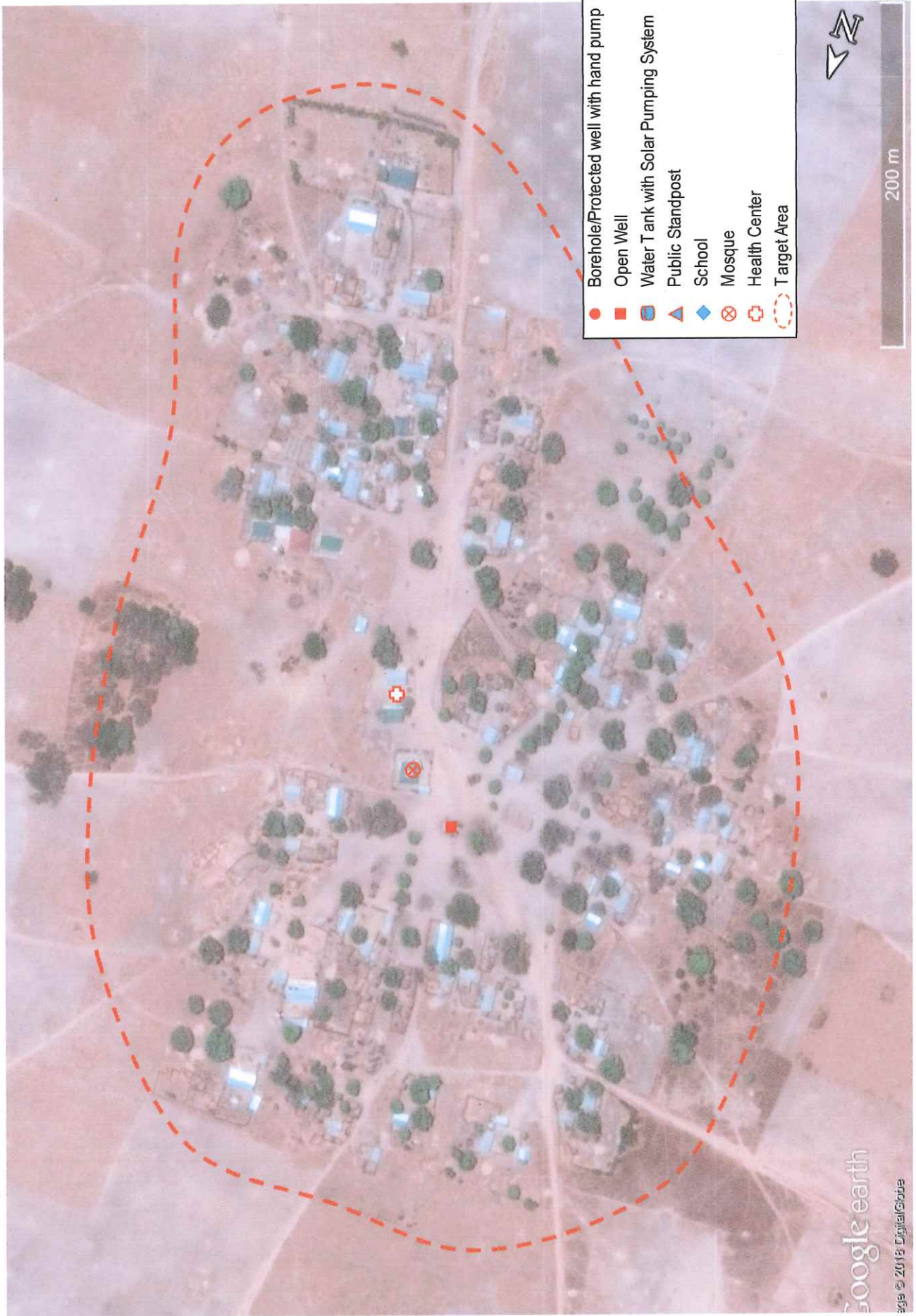
N-09 Sabaha Kataba Cluster





ANNEX-2: Requested Target Area Maps

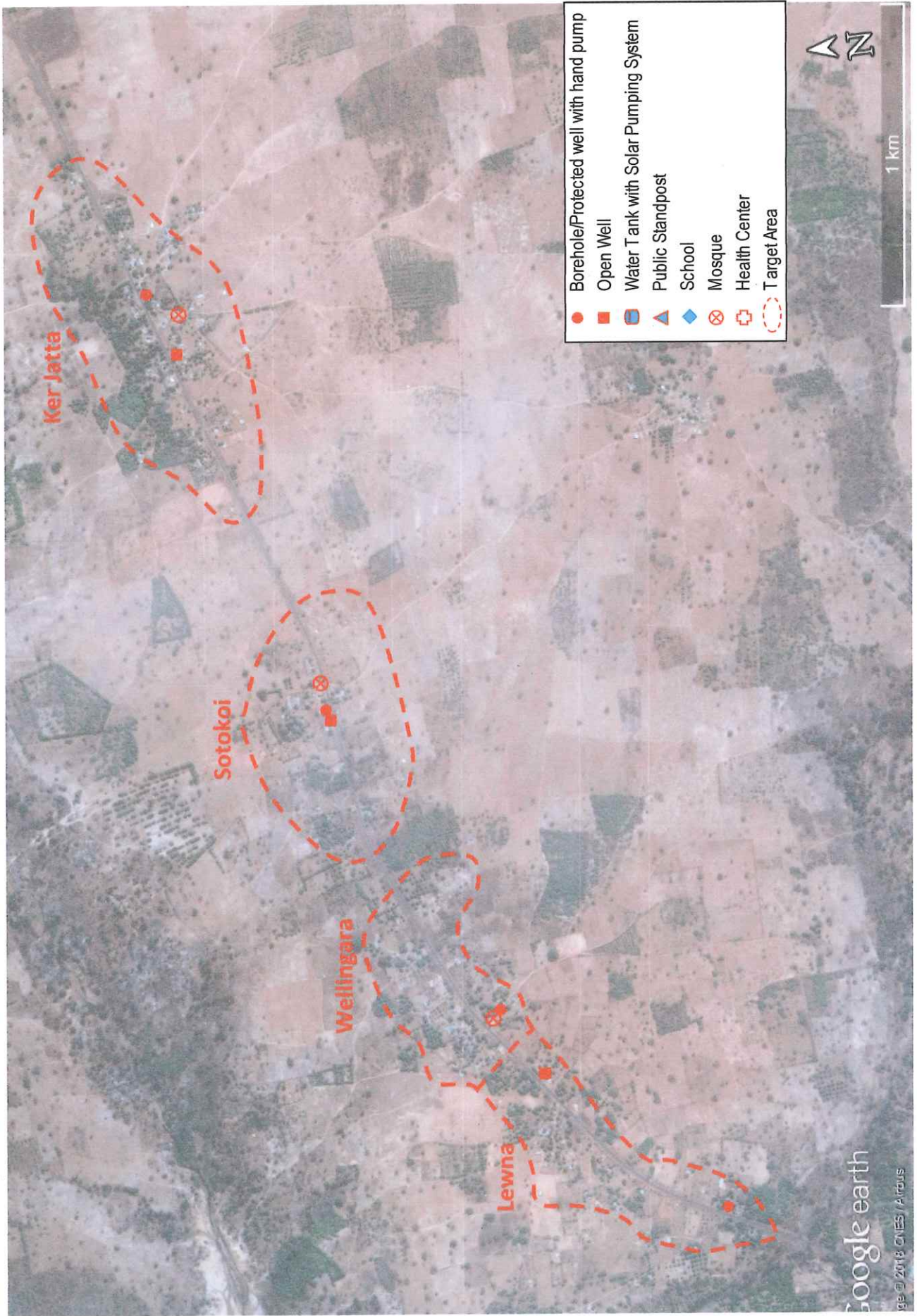
N-10 Passy Chally





ANNEX-2: Requested Target Area Maps

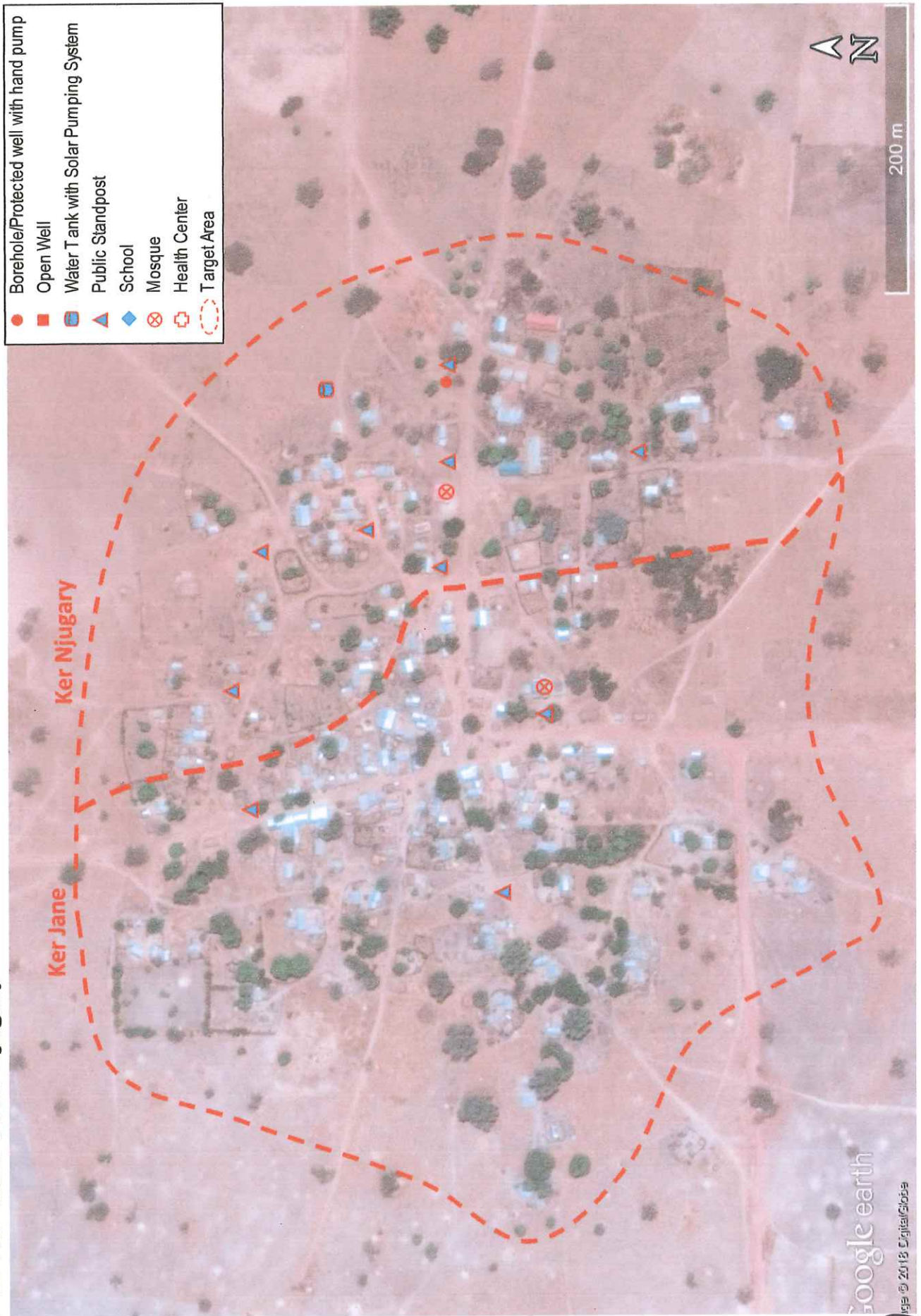
N-11 Lewna, Sotokoi, Ker Jatta, Wellingara Complex





ANNEX-2: Requested Target Area Maps

N-12 Ker Jane + Ker Njugary

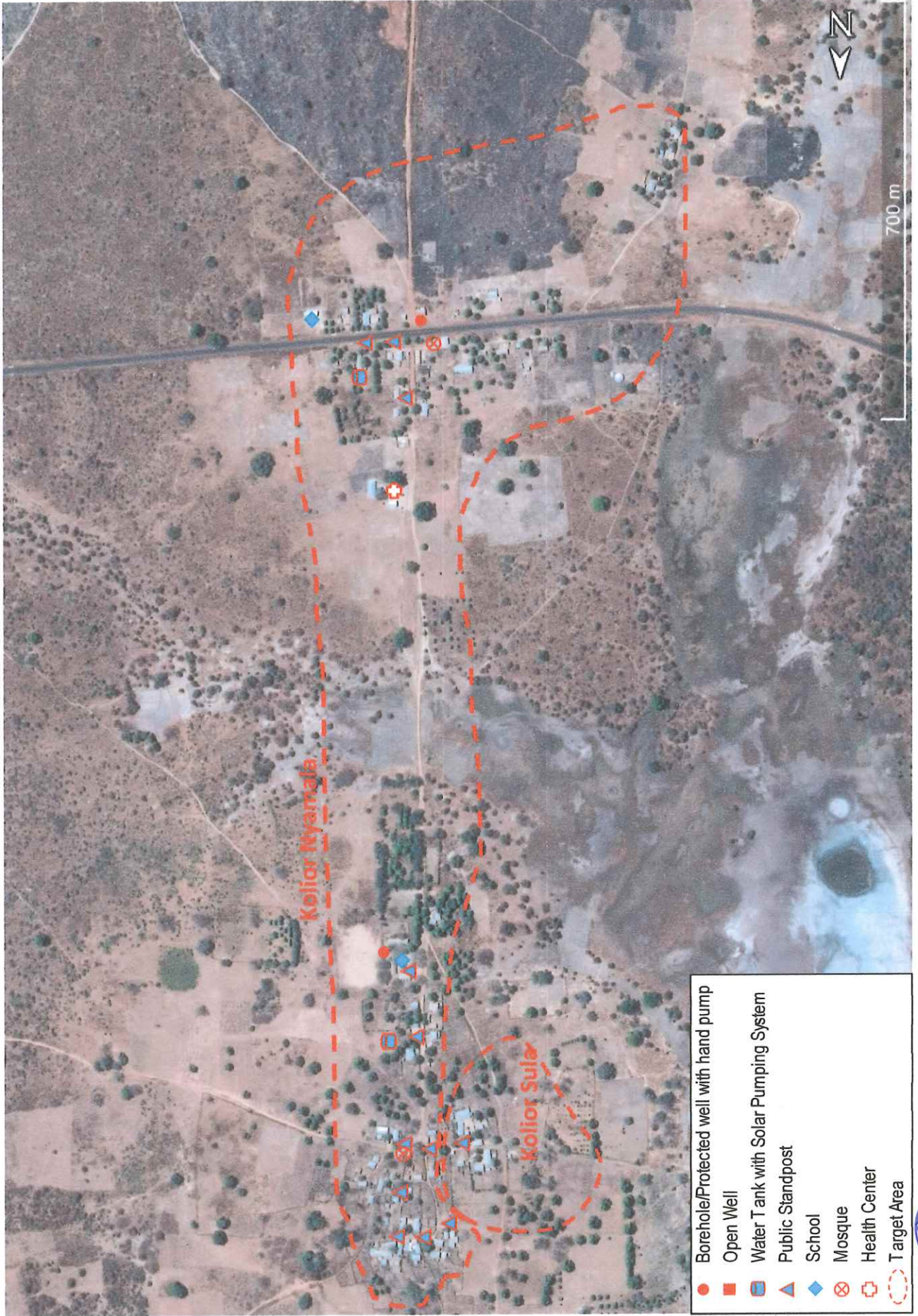


*[Handwritten signature]*



ANNEX-2: Requested Target Area Maps

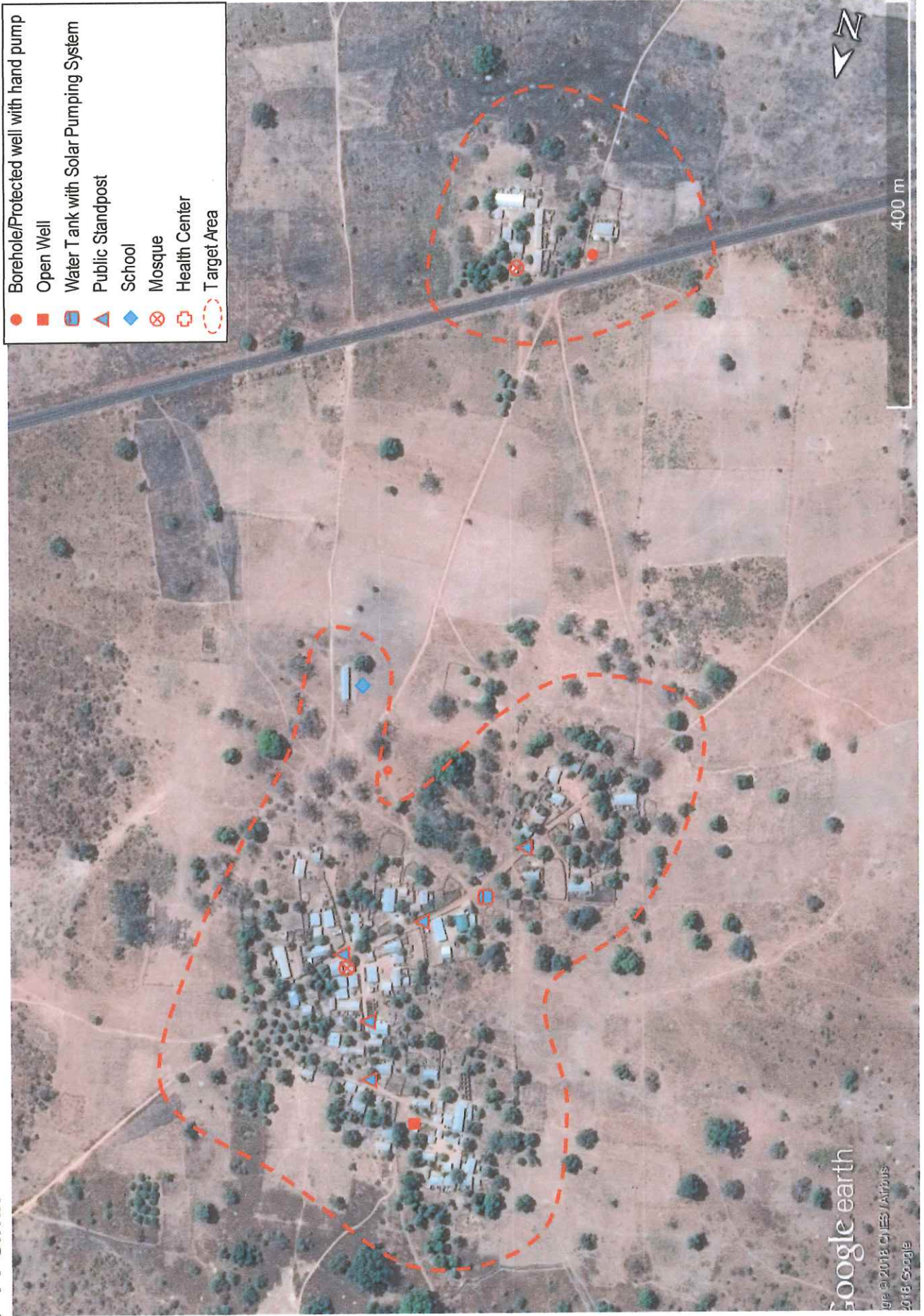
N-13 Kolior Complex





ANNEX-2: Requested Target Area Maps

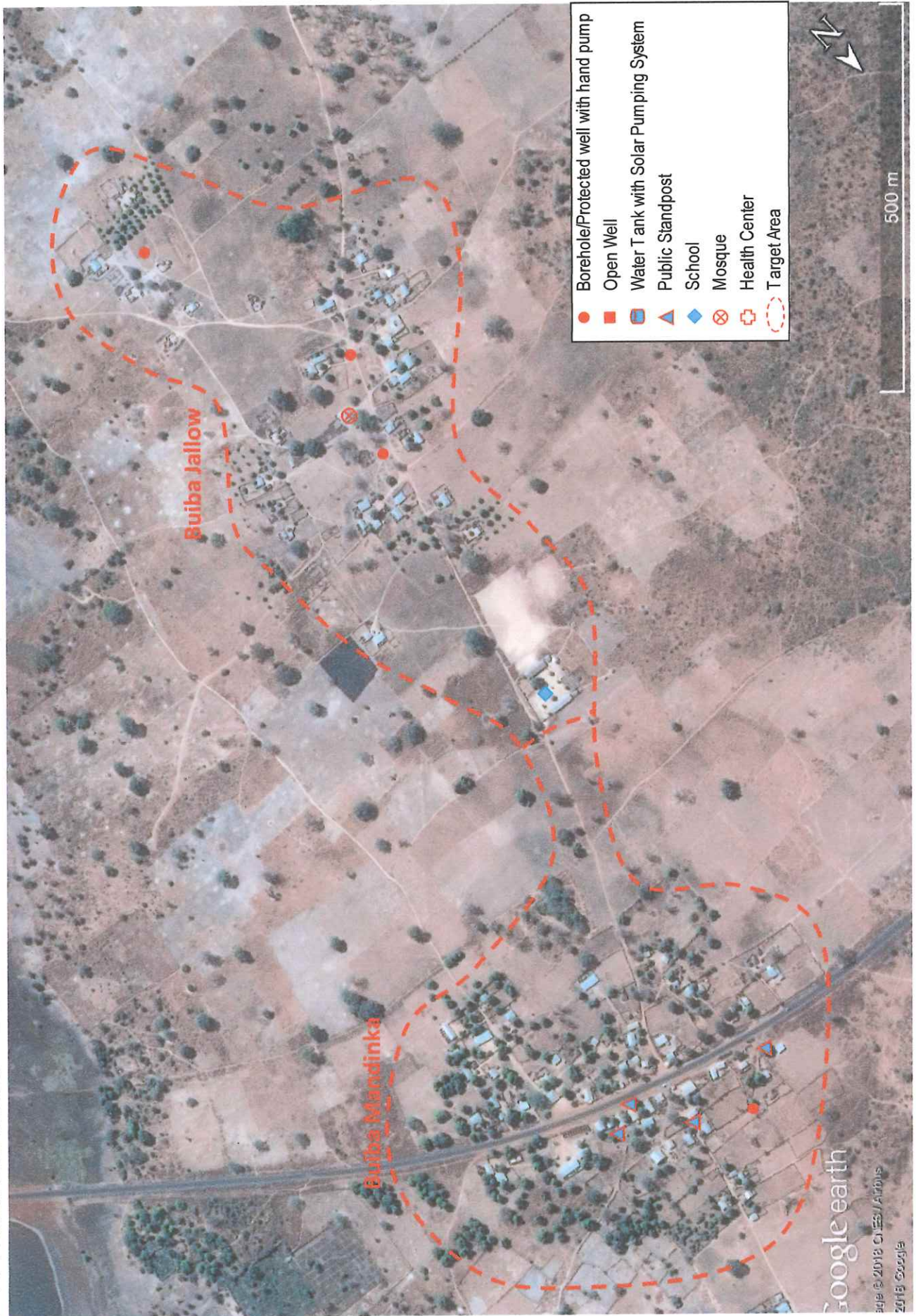
N-14 Jiffin





ANNEX-2: Requested Target Area Maps

N-15 Buiba Mandinka + Buiba Jallow Kunda

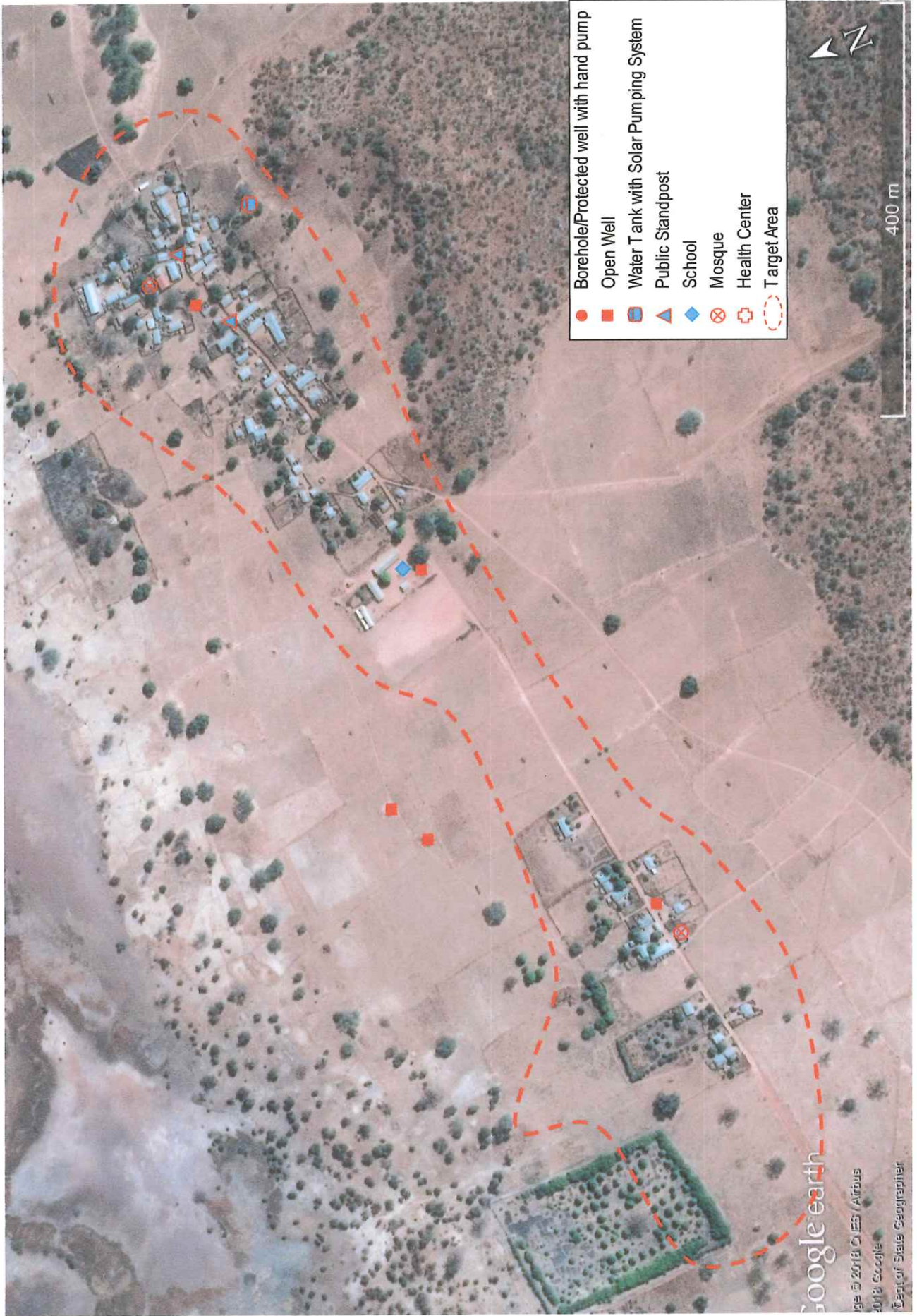


*[Handwritten signature]*



ANNEX-2: Requested Target Area Maps

N-16 Jarra Sukuta

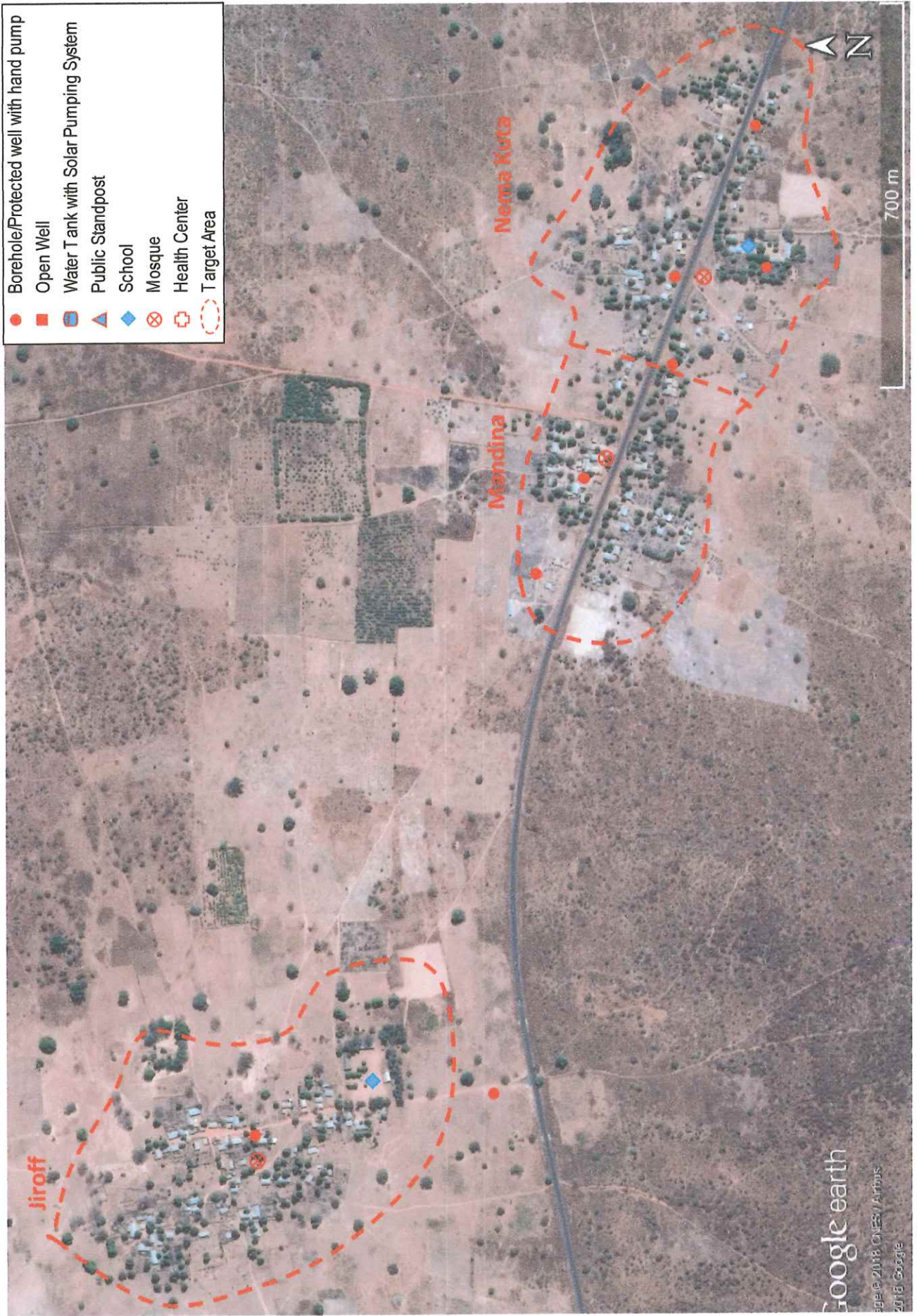


Handwritten signature or initials in black ink.



ANNEX-2: Requested Target Area Maps

N-17 Jiroff + Nema Kuta + Mandina

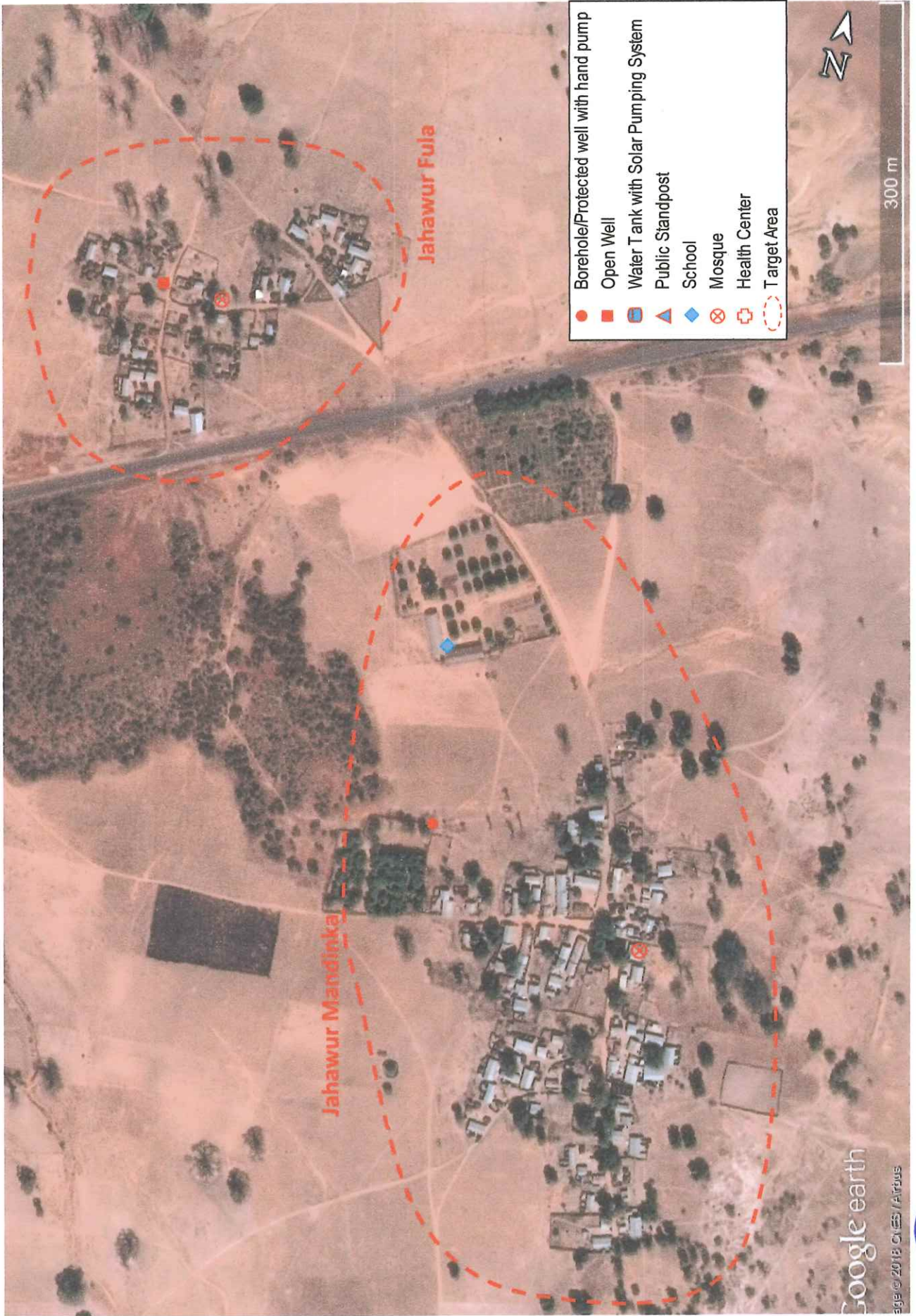


*[Handwritten signature]*



ANNEX-2: Requested Target Area Maps

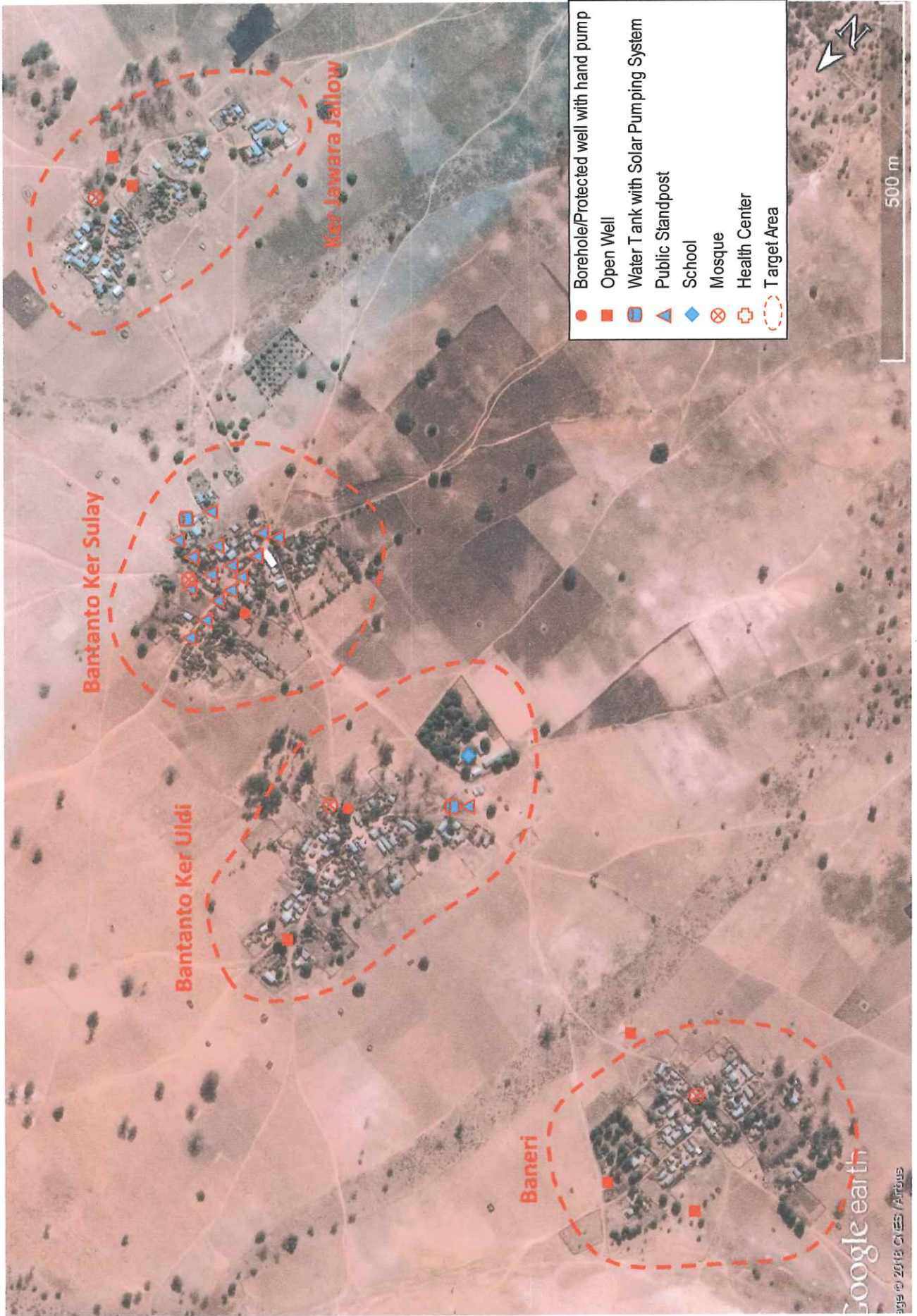
N-18 Jahawur Mandinka + Fula





ANNEX-2: Requested Target Area Maps

N-19 Ker Uldi + Bantanto



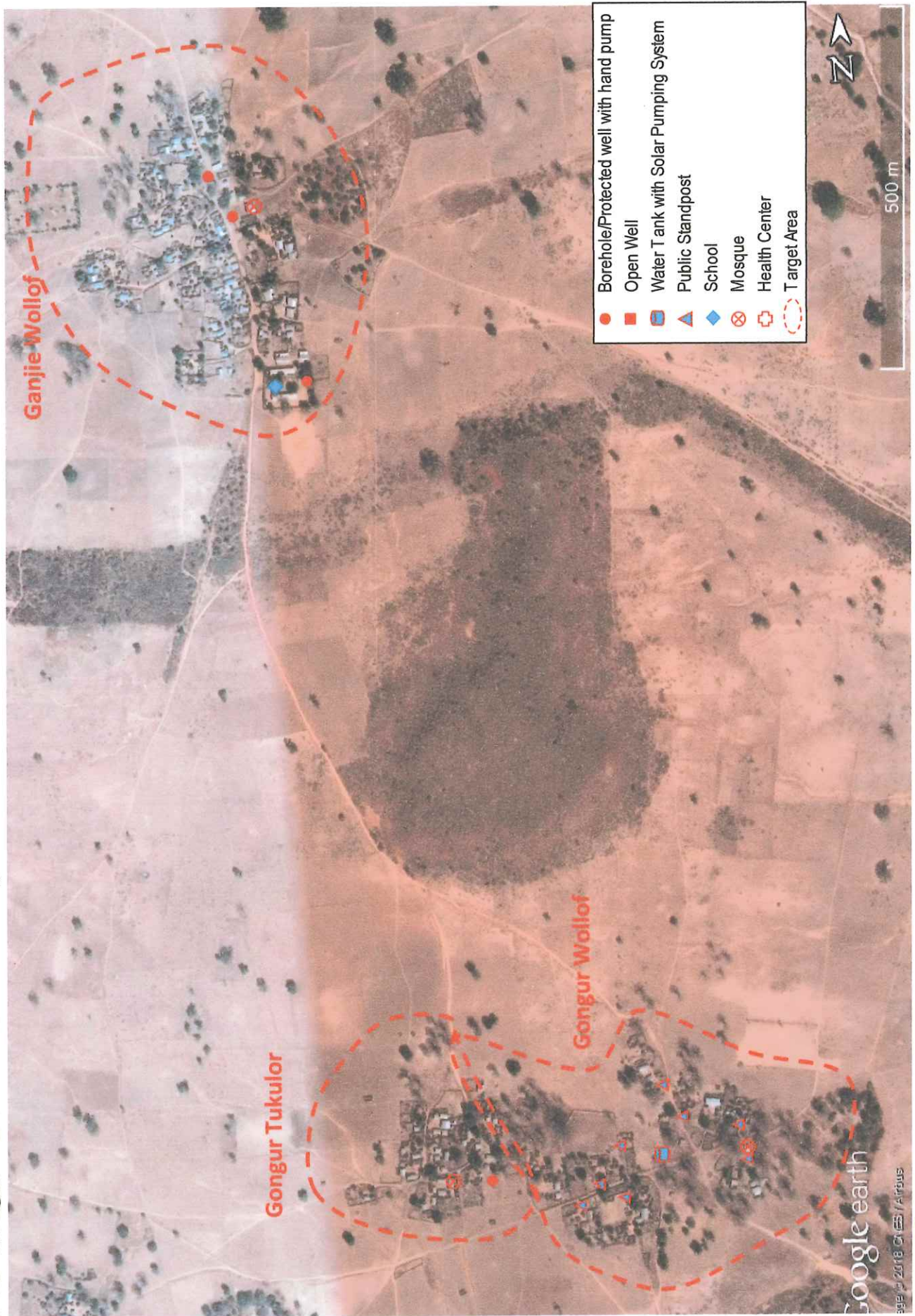
*[Handwritten signature]*





ANNEX-2: Requested Target Area Maps

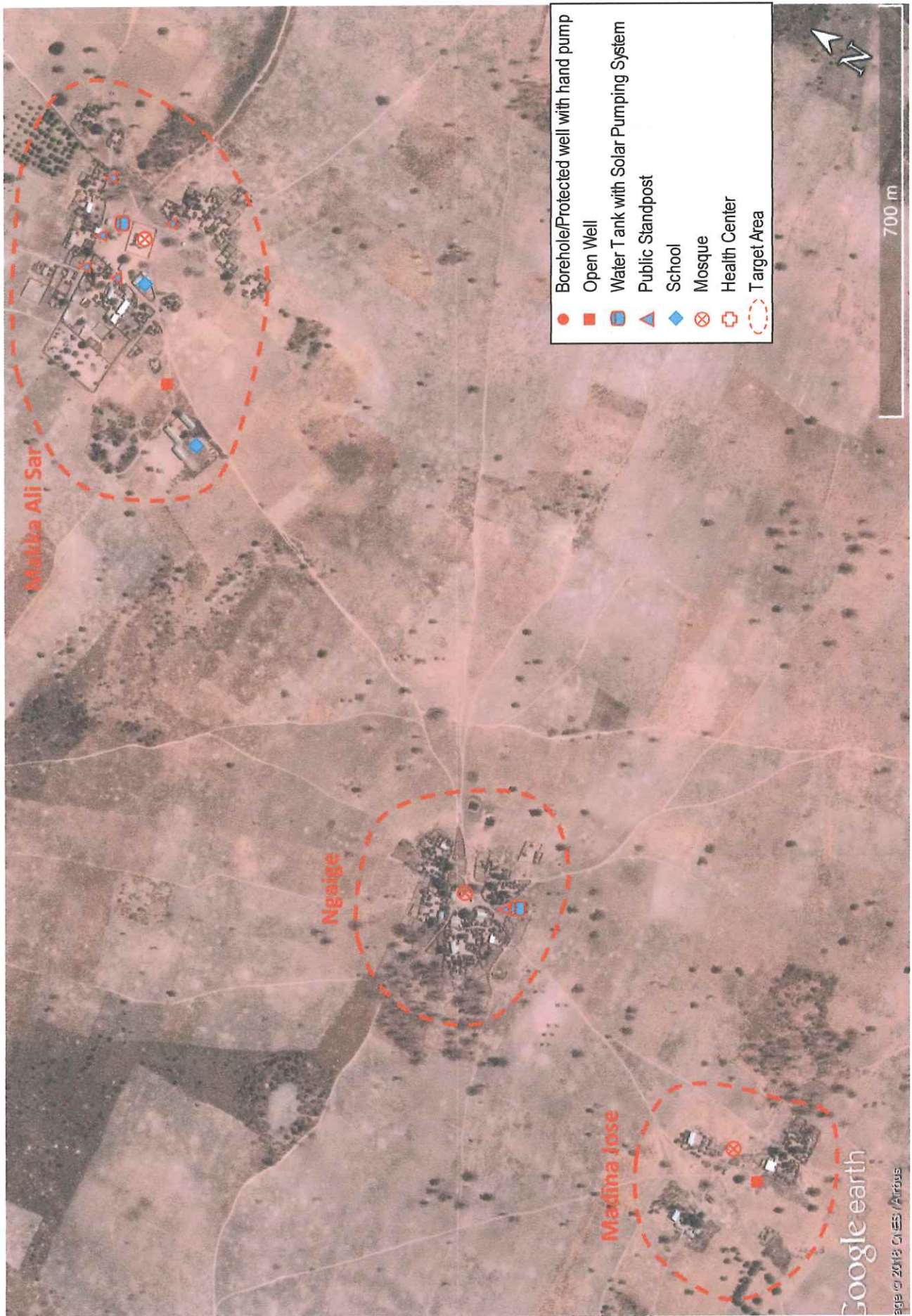
N-20 Gongur Tukolor + Wollof + Ganje Wollof





ANNEX-2: Requested Target Area Maps

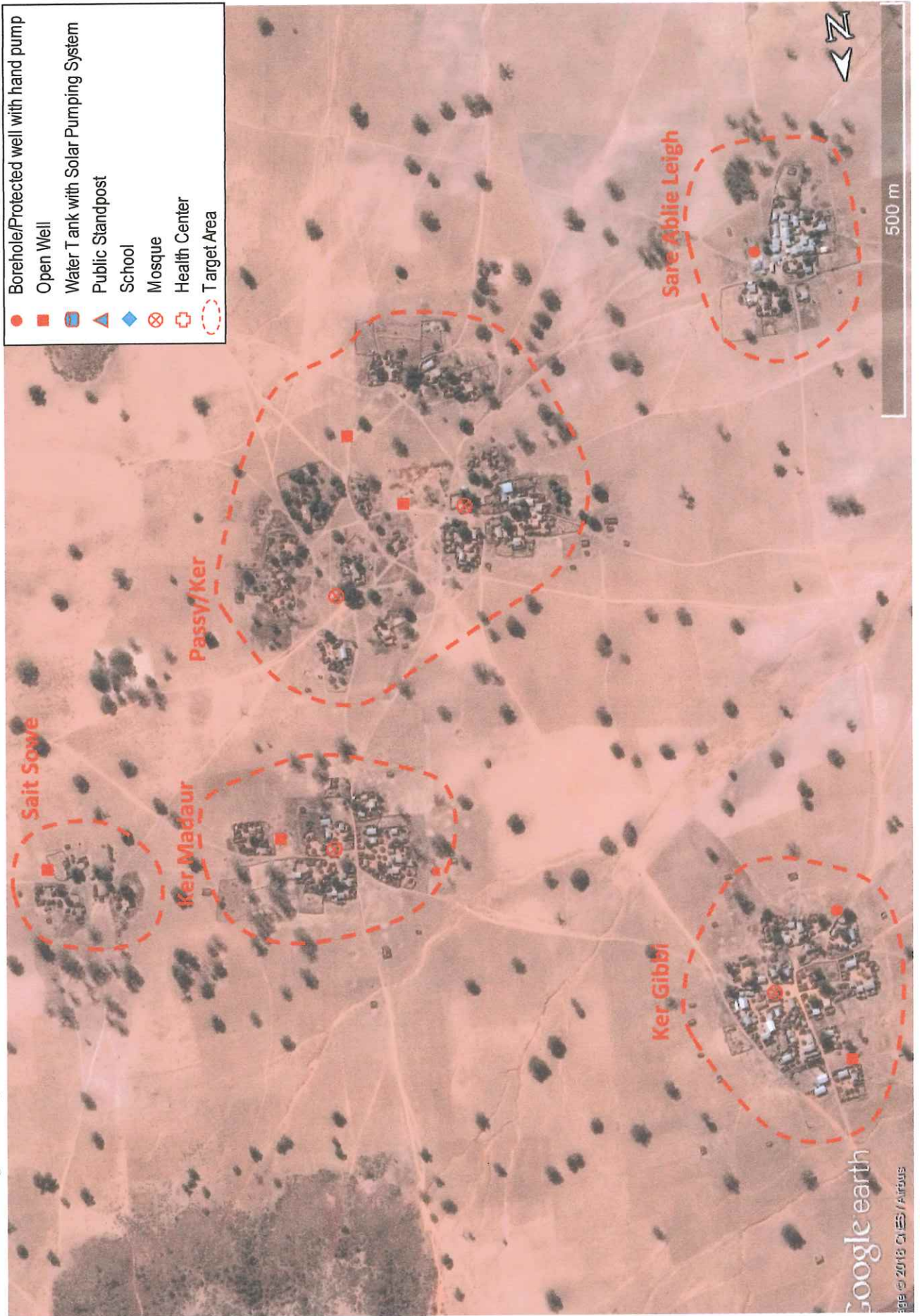
N-21 Ngaige Complex





ANNEX-2: Requested Target Area Maps

N-22 Jarreng Complex



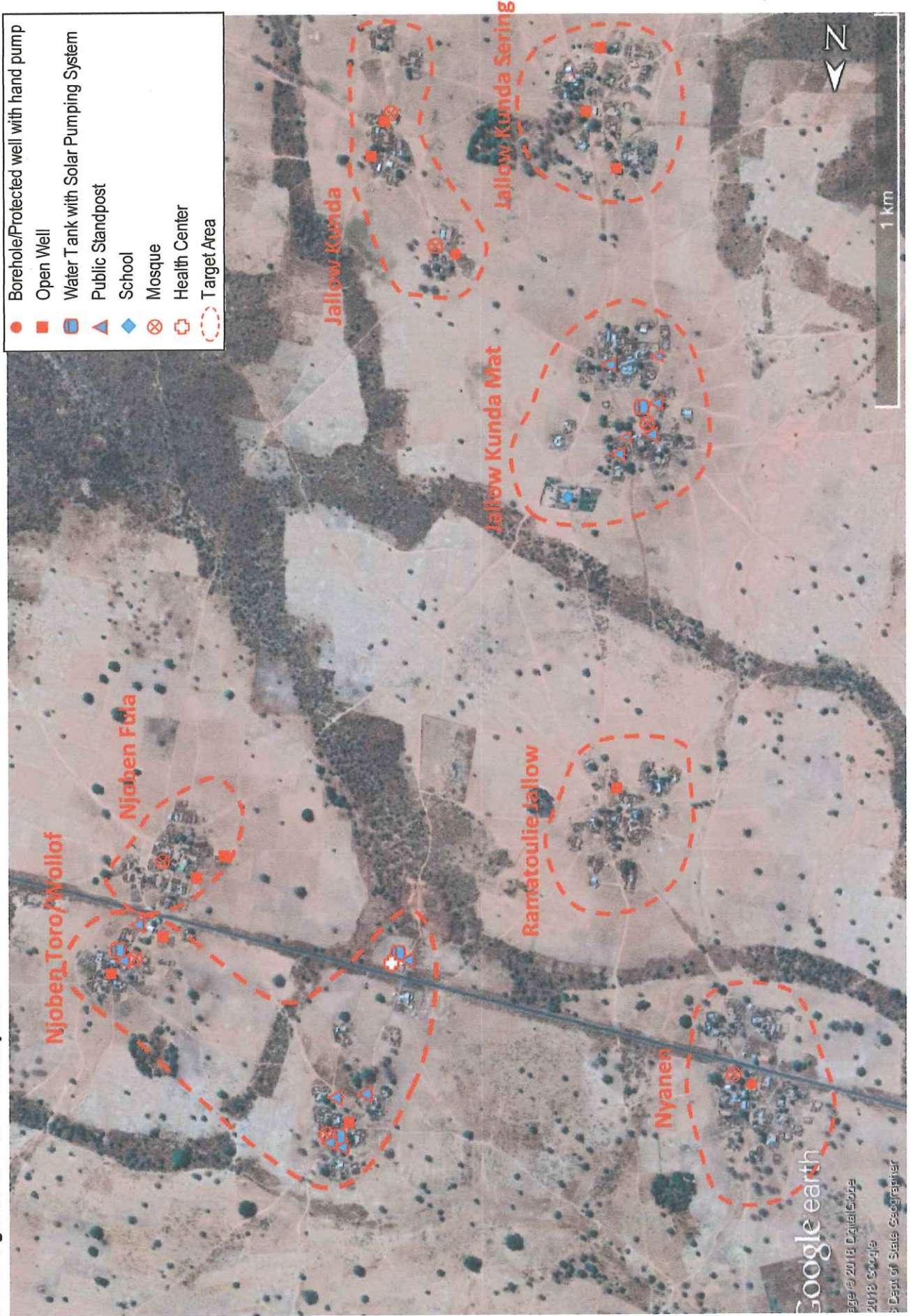
*[Handwritten signature]*

*[Handwritten signature]*



ANNEX-2: Requested Target Area Maps

N-23 Njoben Toro Complex



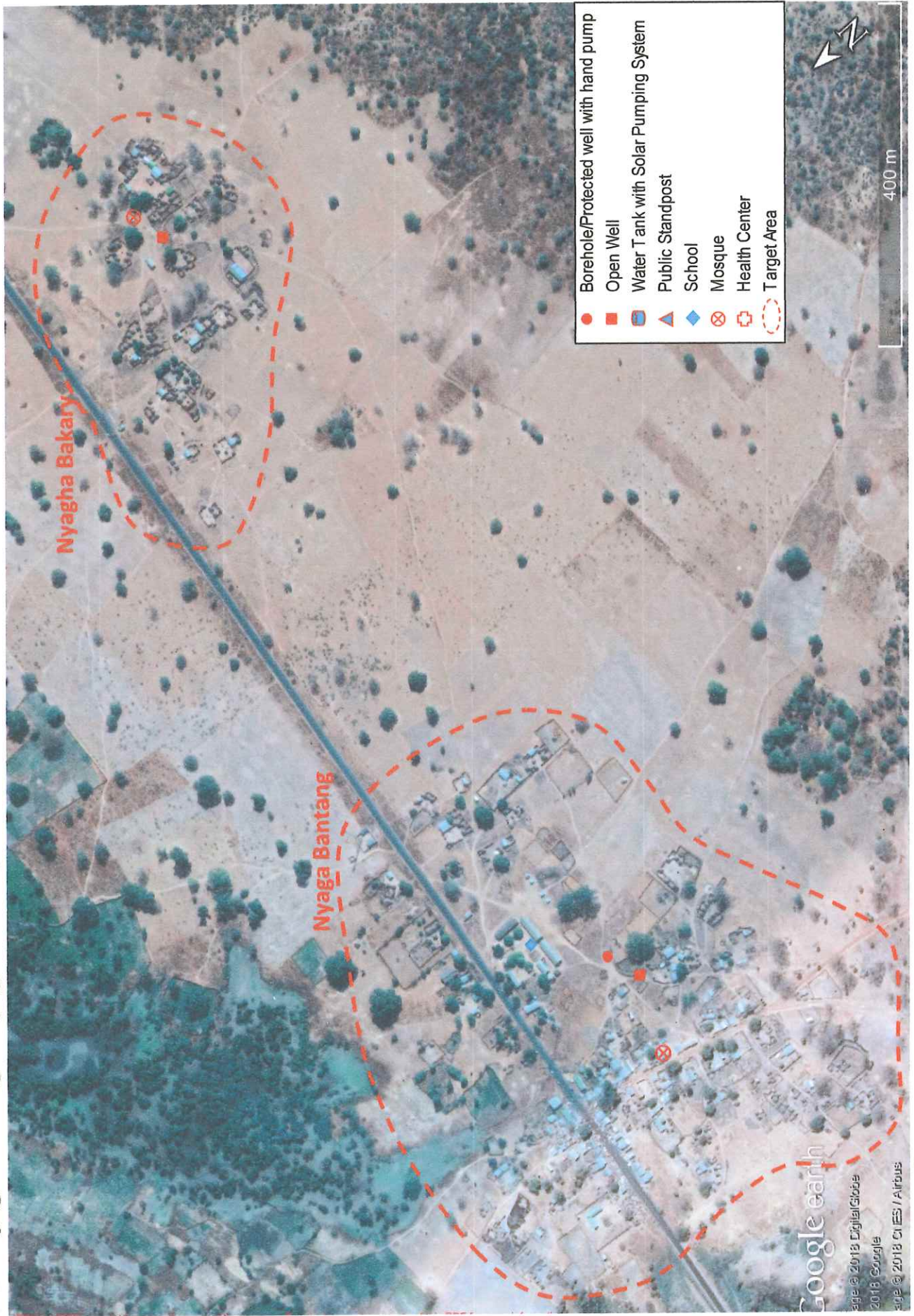
*[Handwritten signature]*

*[Handwritten signature]*



ANNEX-2: Requested Target Area Maps

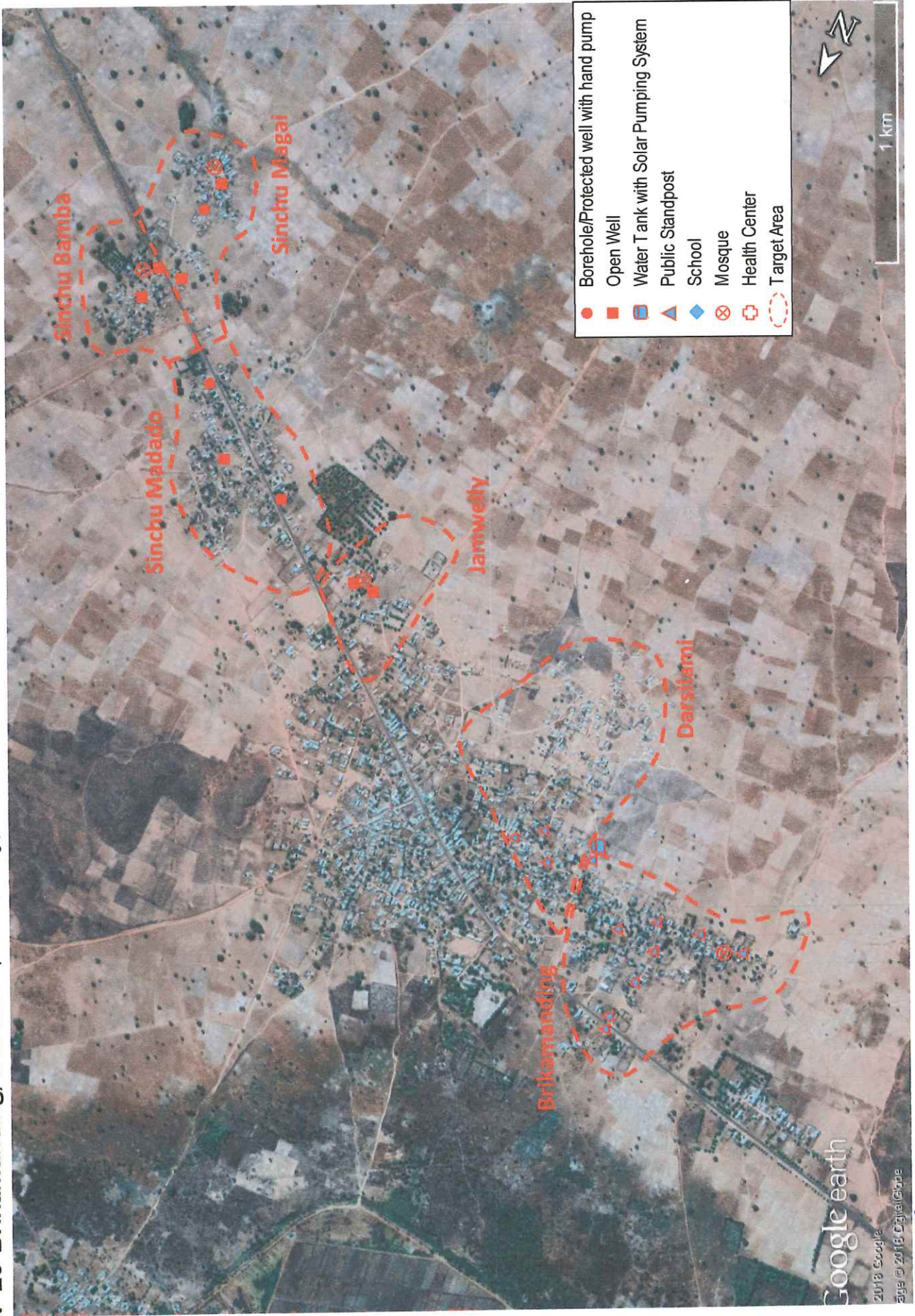
N-24 Nyaga Bantang + Nyagha Bakary





ANNEX-2: Requested Target Area Maps

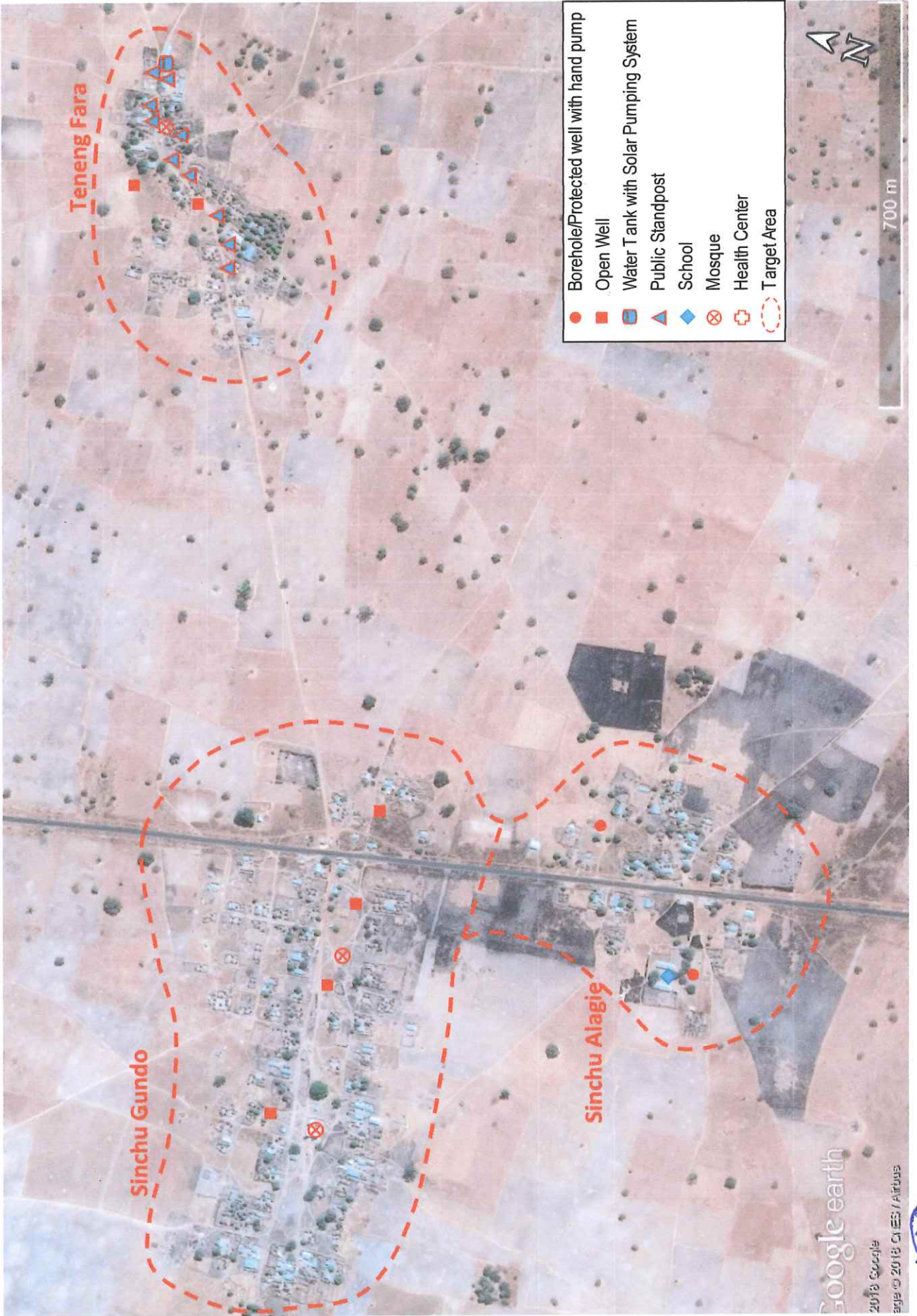
N-25 Brikamanding, Darsilami, Jamwelly, Sinchu Bamba, Sinchu Magai, Sinchu Madado complex





ANNEX-2: Requested Target Area Maps

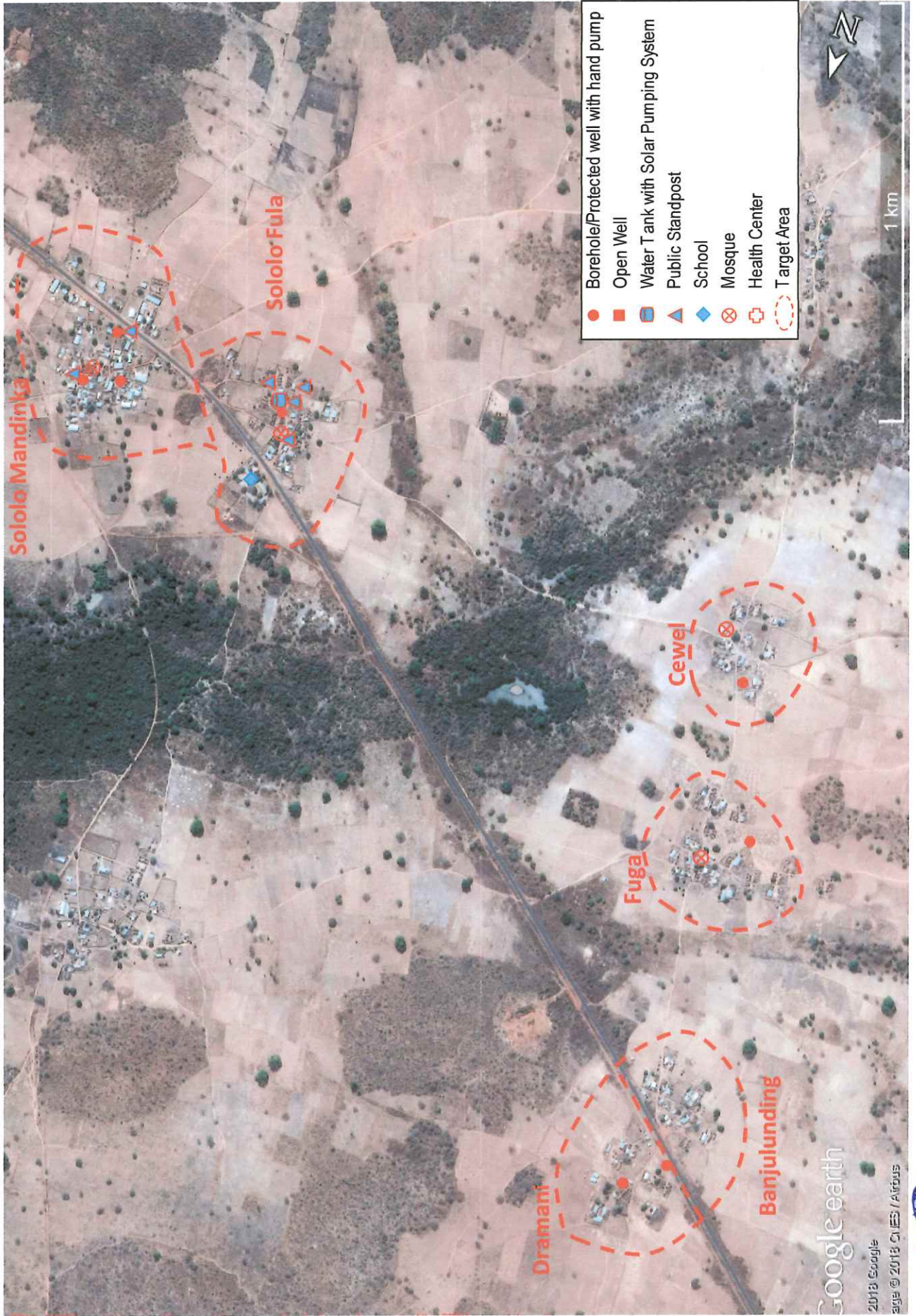
N-26 Teneng Fara Complex





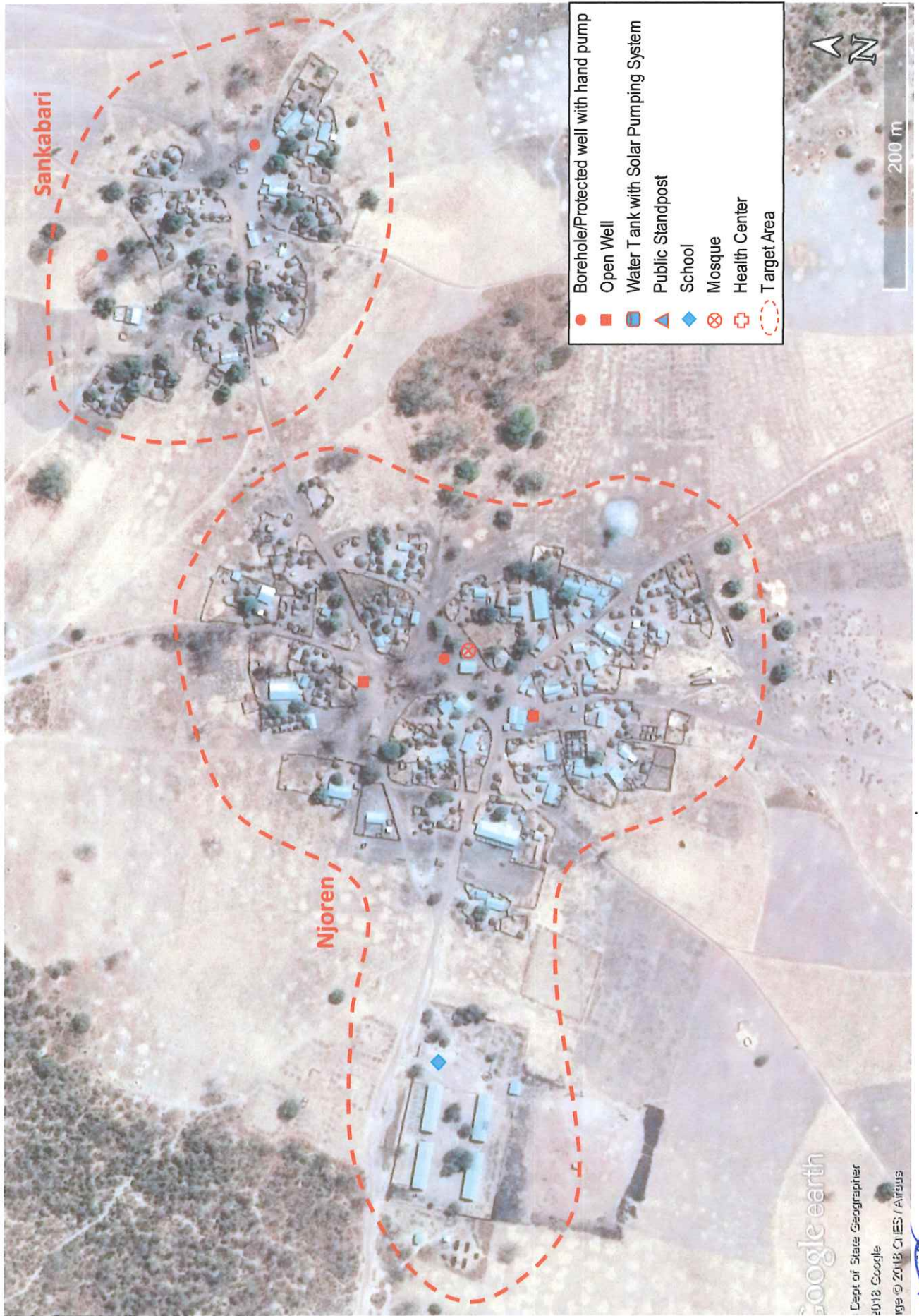
ANNEX-2: Requested Target Area Maps

N-27 Sololo + Fuga + Dramman Complex





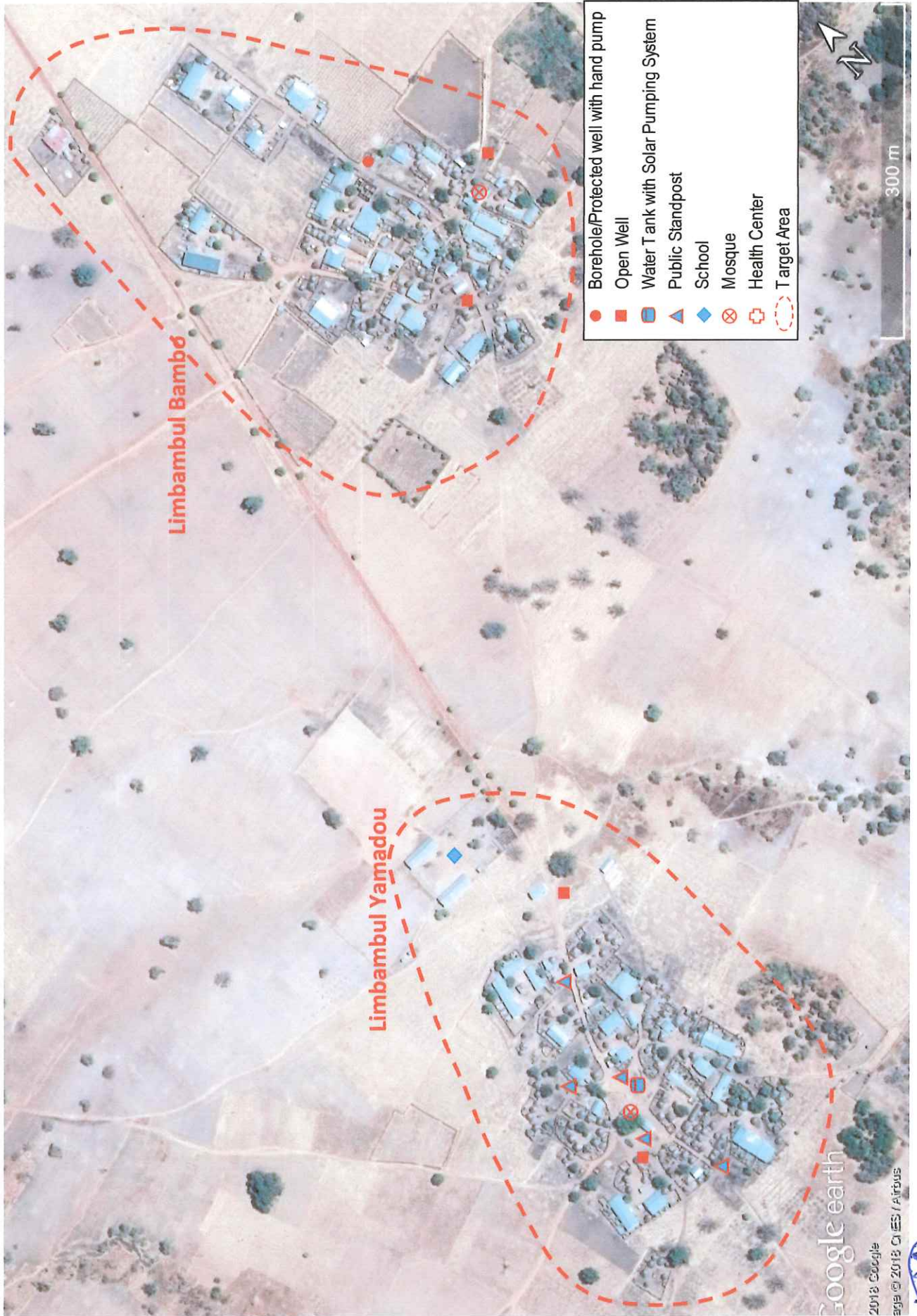
**ANNEX-2: Requested Target Area Maps**  
**N-28 Njoren + Sankabari Complex**





ANNEX-2: Requested Target Area Maps

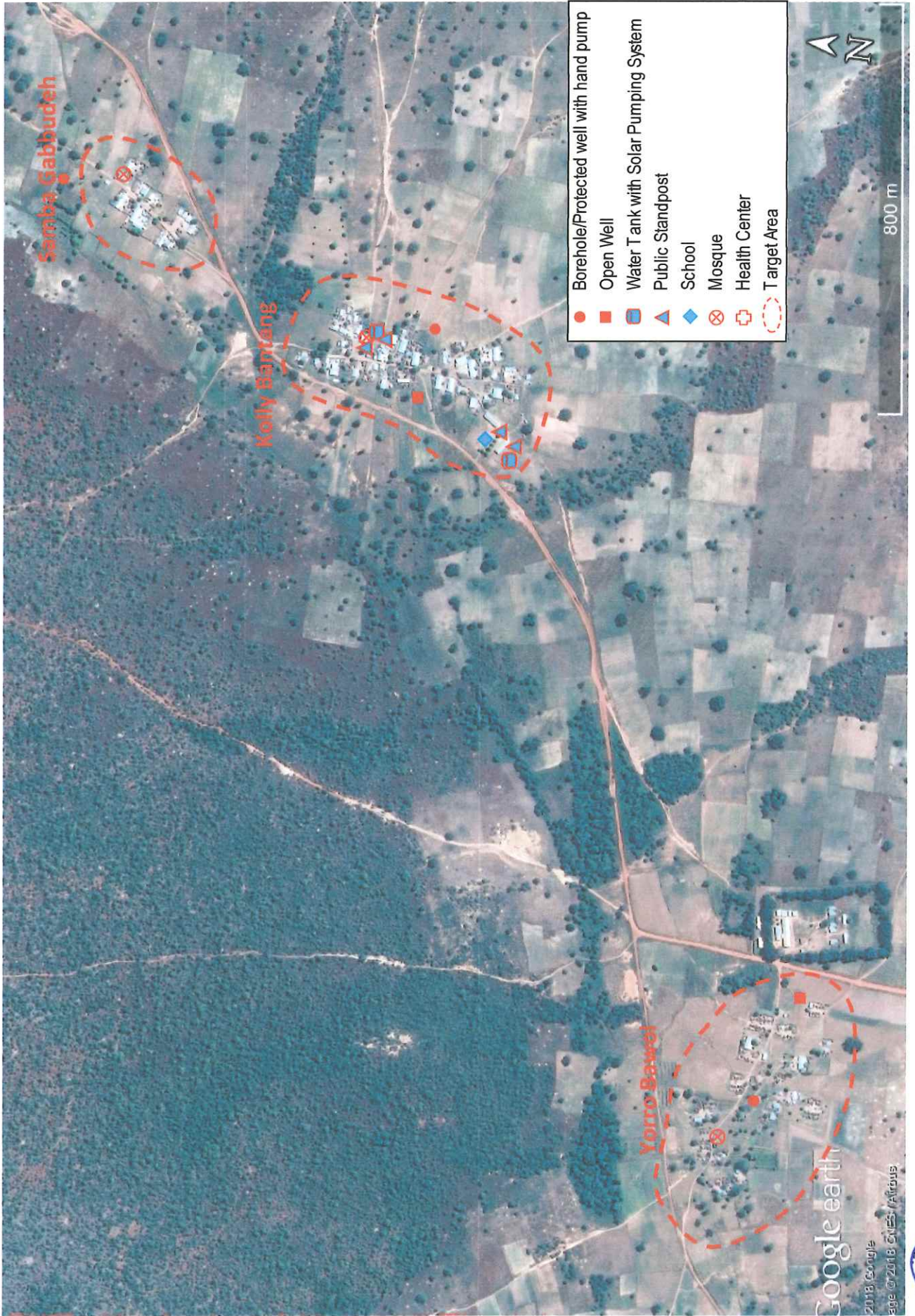
N-29 Limbambul Yamadou + Bambo





ANNEX-2: Requested Target Area Maps

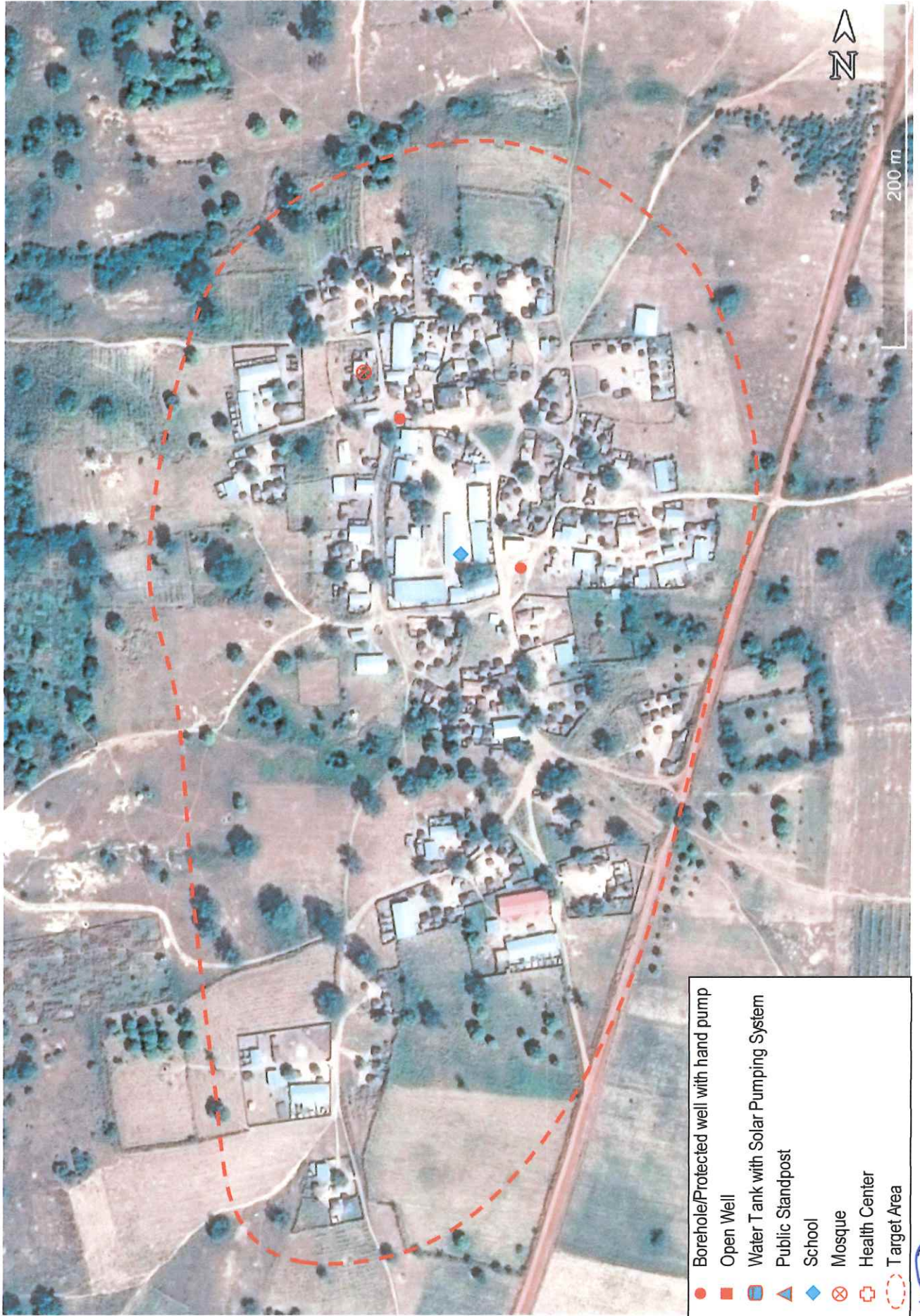
N-30 Kolly Bantang + Yorro Bawol + Samba Gabbudeh





ANNEX-2: Requested Target Area Maps

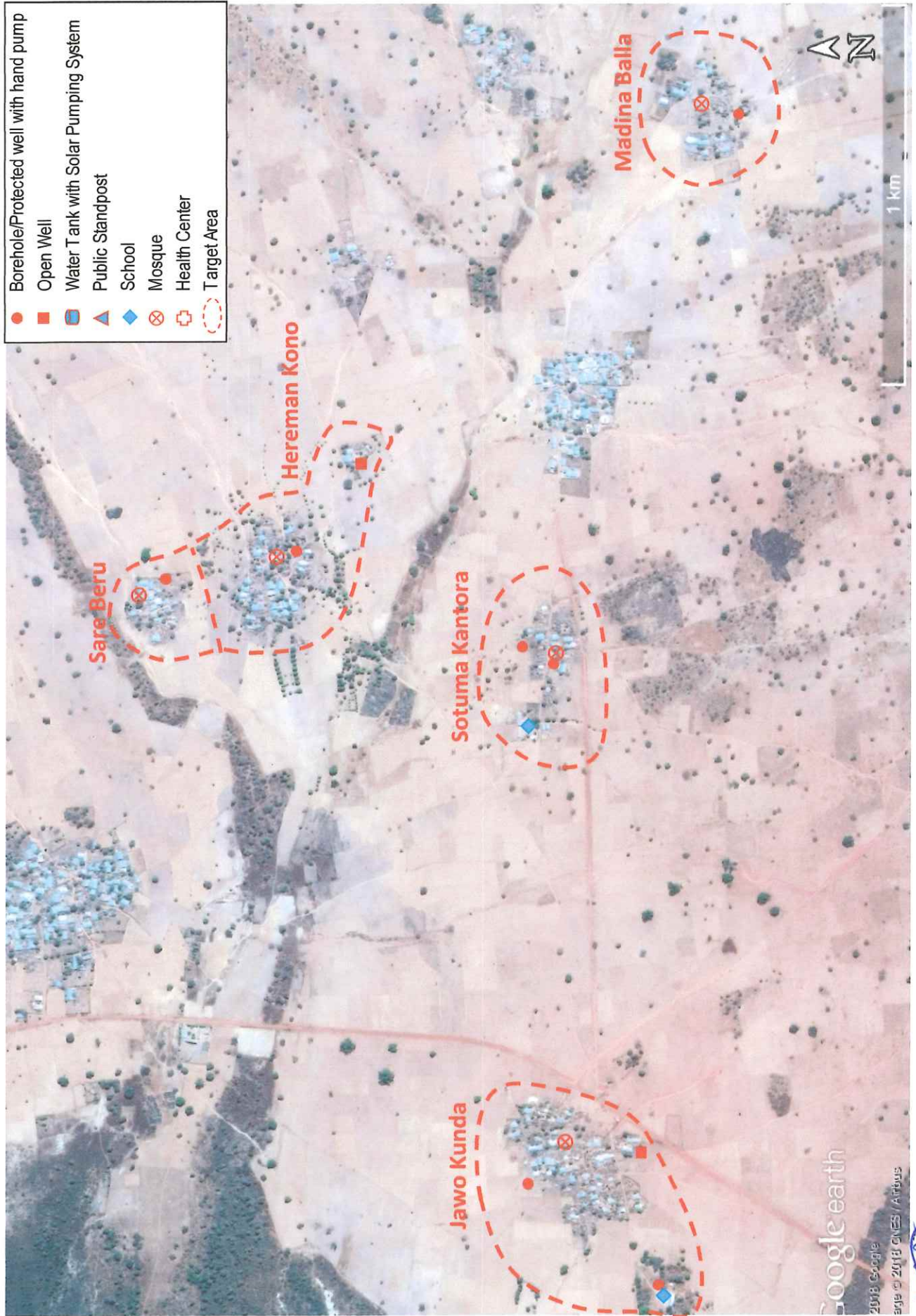
N-31 Touba Wulli





ANNEX-2: Requested Target Area Maps

N-32 Sotuma Kantora, Jawo Kunda, Madina Balla complex



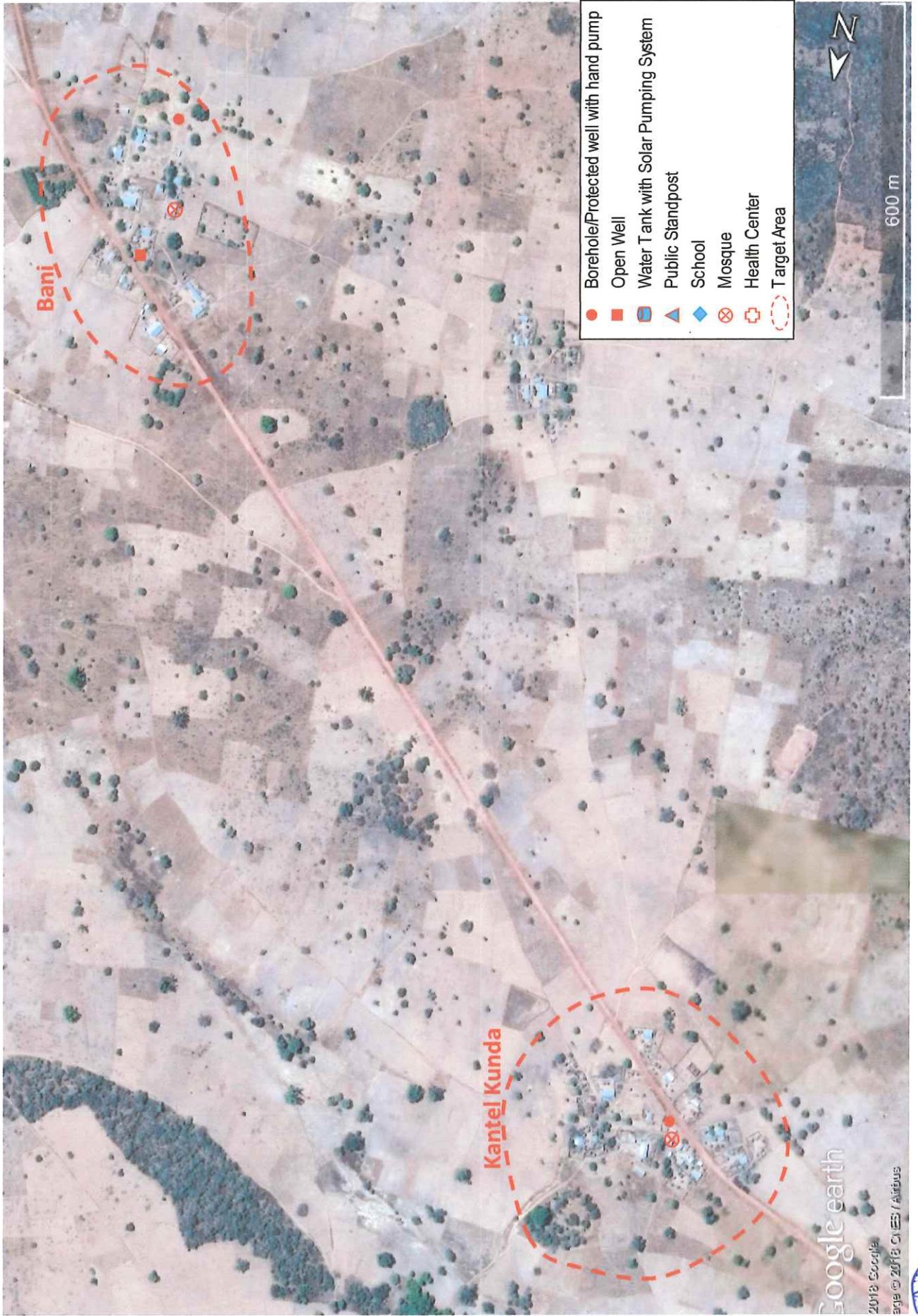
Handwritten signature or initials in blue ink.

Handwritten signature or initials in blue ink.

Google earth  
2018 Google  
8318 © 2018 CNES / Airbus



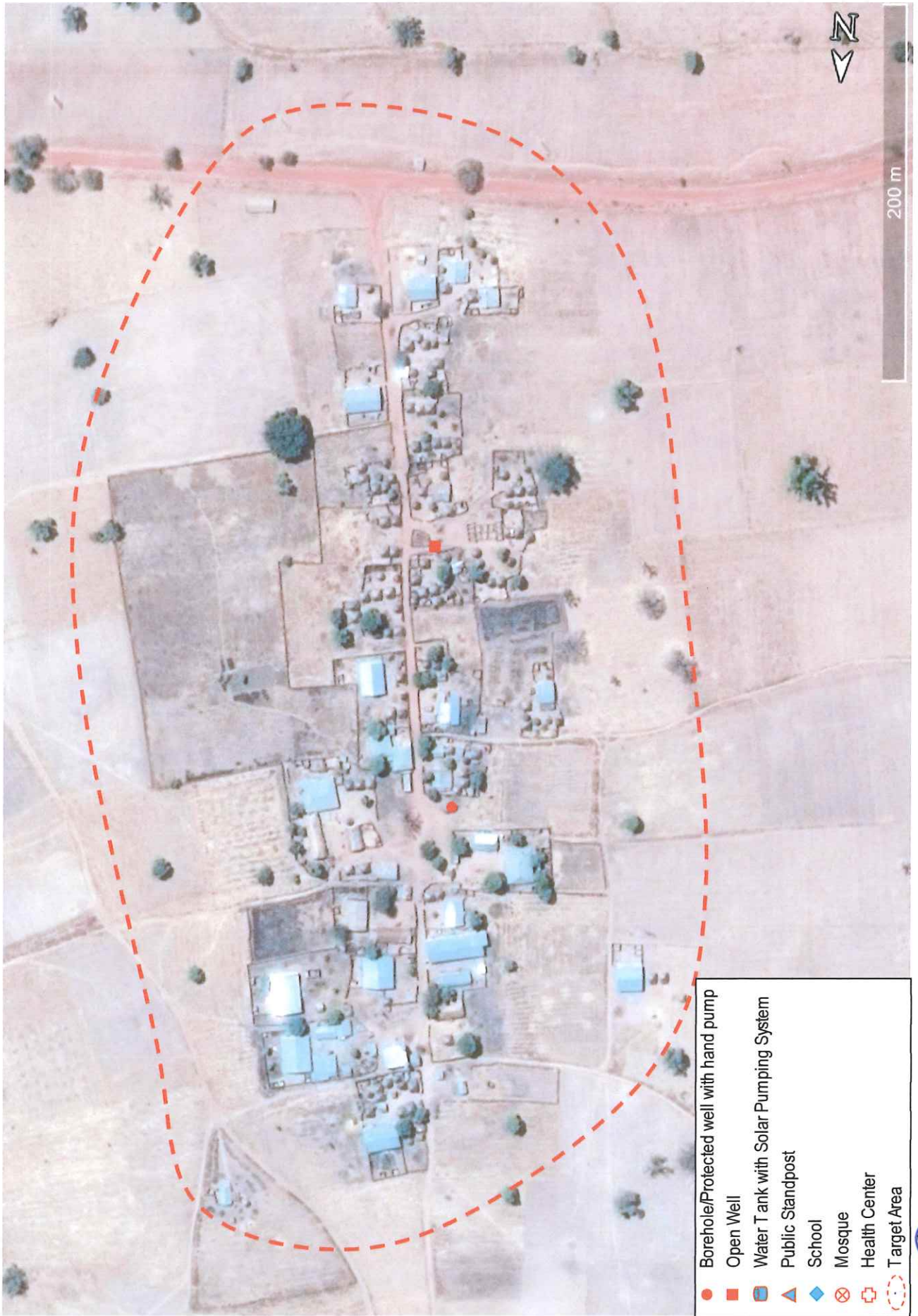
ANNEX-2: Requested Target Area Maps  
N-33 Bani + Kantel Kunda





ANNEX-2: Requested Target Area Maps

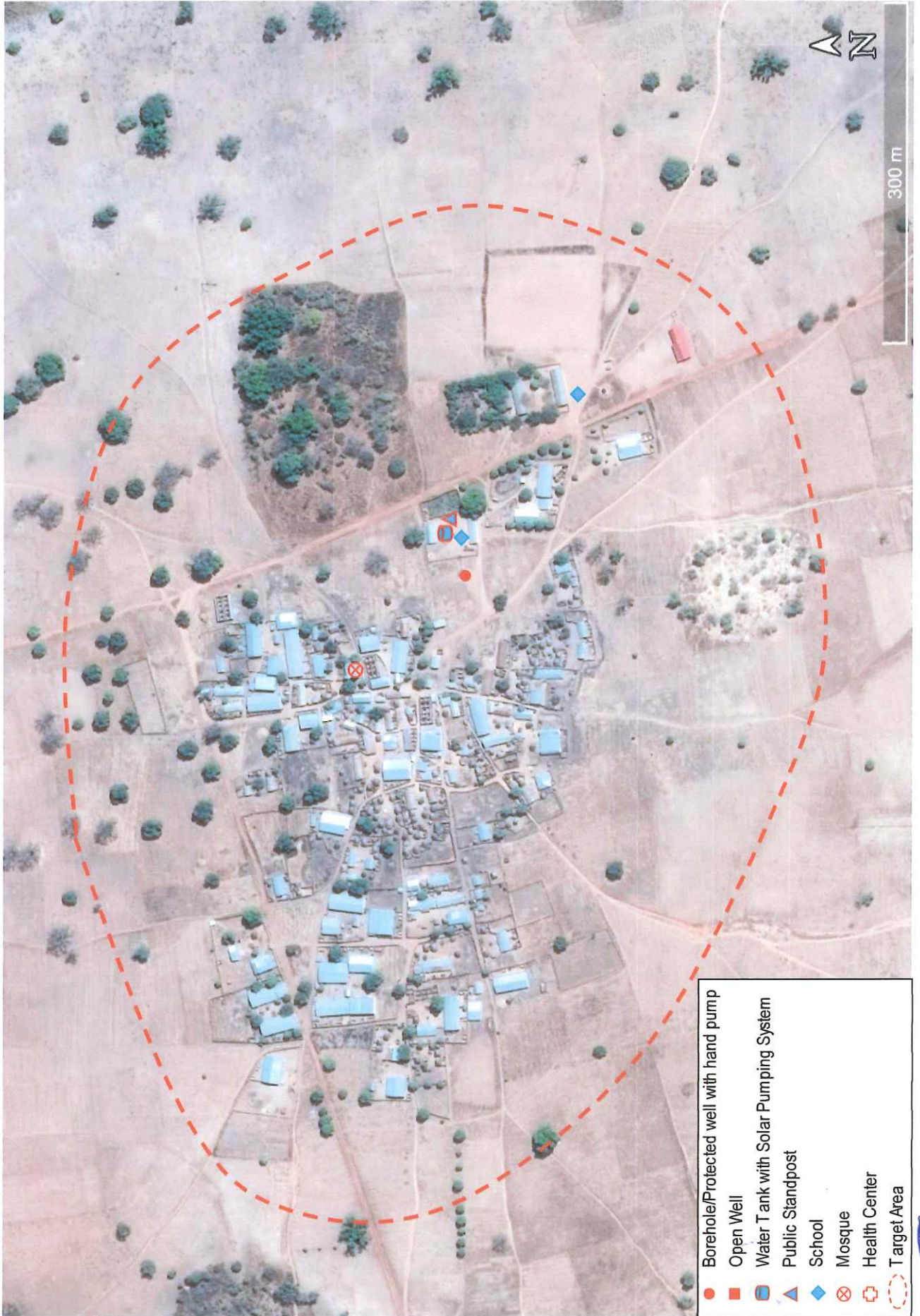
N-34 Simoto Touba





ANNEX-2: Requested Target Area Maps

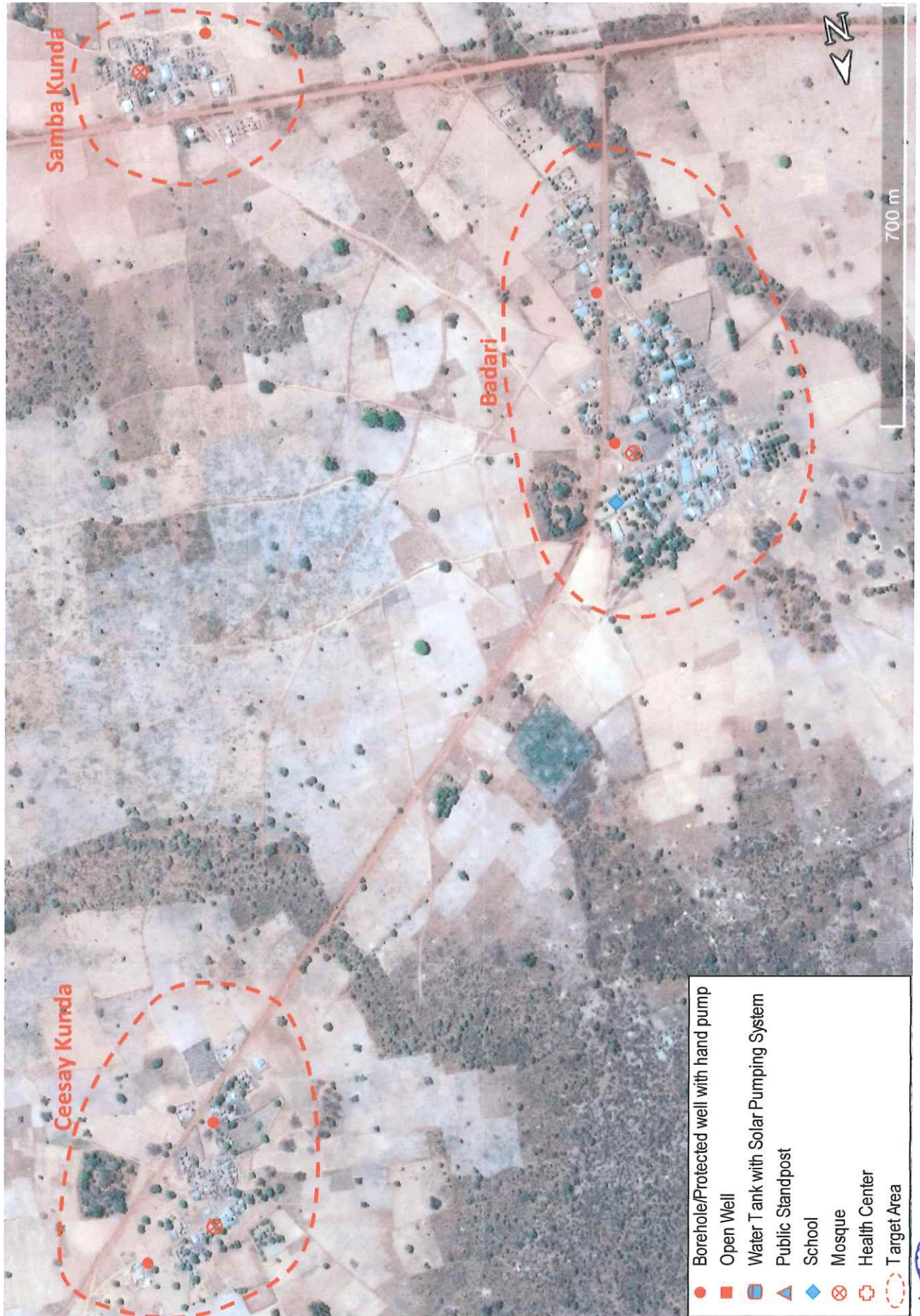
N-35 Perai Tenda





ANNEX-2: Requested Target Area Maps

N-36 Samba Kunda + Badari + Ceesay Kunda

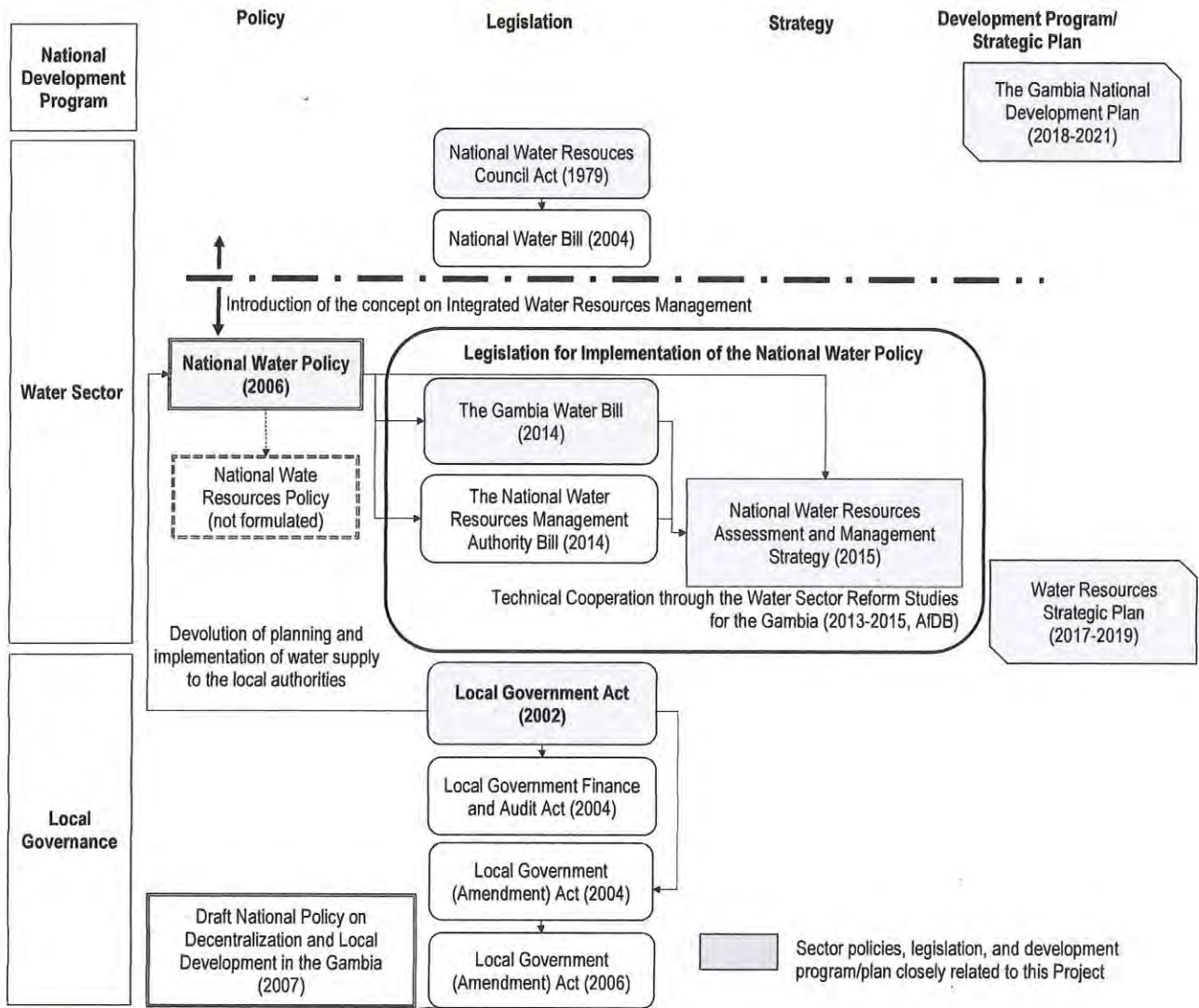


16/19

16/19



**Annex-3 : National Policies, Legislation, Strategies and Development Programs Related to the Water Sector**



Handwritten signatures and initials in blue and black ink are present at the bottom of the page.

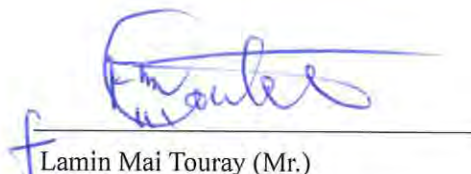


TECHNICAL NOTE  
ON THE PREPARATORY SURVEY  
ON  
THE PROJECT FOR RURAL WATER SUPPLY (PHASE IV)  
IN  
THE REPUBLIC OF THE GAMBIA

The Technical Note attached in the following pages confirms various matters discussed among the Japan International Cooperation Agency (hereinafter referred to as “JICA”) Preparatory Survey Team and Department of Water Resources (hereinafter referred to as “DWR”) during the Second Preparatory Survey period for the Project for Rural Water Supply (Phase IV), (hereinafter referred to as “the Project”). The Technical Note does not state final results of the Survey because it contains issues which are under considerations.

Banjul, February 7th, 2019

  
Kazuhiro Arita (Mr.)  
Chief Consultant / Water Supply  
Planning / Water Facility Design 1  
JICA Preparatory Survey Team

  
Lamin Mai Touray (Mr.)  
Director  
Department of Water Resources



## ATTACHMENT

The following items are confirmed by the Gambian side and the JICA Preparatory Survey Team (hereinafter referred to as "Survey Team") based on the results of the Second Preparatory Survey.

### 1. Site N-01 Suma Kunda Complex

Regarding site N-01 Suma Kunda Complex consisting of three villages (Tumani Tenda, Suma Kunda and Amdalai), two piped water supply schemes are in operation in "Tumani Tenda" and the validity of providing additional water to the village in this project is considered low. Therefore, after discussion with DWR, Tumani Tenda village was decided not to be included in this project.

### 2. eWaterPay

From the outcomes of discussions held with DWR and eWaterPay Ltd. (hereinafter referred to as "eWaterPay"), the introduction of pre-paid water meter technologies using eWaterTaps and related applications in this project is considered inappropriate.

eWaterPay clearly showed their position that it was not acceptable for them to lower the existing water tariff level (GMD25/m<sup>3</sup>). eWaterPay also explained that they were interested in providing eWaterTaps and services for operation and maintenance of piped water schemes as a package.

DWR considers the water tariff level set by eWaterPay is too high for the rural communities, which hinders their use of the products and services of eWaterPay for pre-paid metering for rural water supply projects. Moreover, DWR expressed that entrusting management of piped water supply schemes in rural areas to private service providers would not be an option in The Gambia.

### 3. Net Fence for the Solar Pumping System

Based on the discussion with DWR, in order to prevent groundwater pollution at the boreholes, in principle, fencing area for the solar pumping system has been decided as 30m×30m to keep enough space from potential pollution source.

### 4. Stepping Up the Water Services Ladder by Providing Yard Taps

Regarding raising water service level to yard tap, DWR considers it is too early to raise the service level to yard tap because the public tap stands, the lower level of service, have not yet been distributed enough to many rural communities.



### 5. The Test Borehole Drilled in N-18

In regards to the issue of the location of the borehole drilled in N-18 Jahawur Mandinka + Fula in the Central River Region, which was sited relatively close to the national highway (about 12.6 m away laterally from the edge of the asphalt pavement), DWR accepted the drilled borehole to be used for the rural water supply project under the following conditions provided by The National Roads Authority (NRA):

- 1) Any structures to be constructed in the future such as fences surrounding the borehole should be located at least 40 m away from the centerline of national highway.
- 2) It is necessary to consult with NRA before deciding the location of those structures (including fences, solar panels, tanks etc.).

### 6. Test Boreholes

Reference is made to the “Paragraph 2. Test Drilling” in the Minutes of Meeting signed on 2<sup>nd</sup> November, 2018 between the Survey Team and Ministry of Fisheries, Water Resources and National Assembly Matters and “Paragraph 11. Division of Responsibility for Test Boreholes” in the Technical Notes signed on 19<sup>th</sup> June, 2018 between the Survey Team and DWR.

After the completion of the test drilling, the test boreholes considered successful (defined in terms of yield larger than 5m<sup>3</sup>/hr and WHO drinking water quality standard) , will be handed over to DWR. DWR will take responsibility for maintaining and protecting the test boreholes until the commencement of the construction of the facilities under the Project.

The following items are confirmed by the Gambian side and the Survey Team based on the results of the test drilling.

#### (1) Results of the test drilling

During the course of the test drilling, supervision of the drilling work was carried out by the Survey Team members and Counterpart Staff from DWR. The preliminary results of the test drilling in each site are described in the following table. The final results of the test drilling, including the pumping test and water quality analysis results will be submitted to DWR as they are ready.

Table-1 Test Drilling Result (Preliminary)

Site No.	Site Name	Completion Depth (m)	Pumping Test			Water Quality As per result from laboratory
			Static Water Level(m)	Dynamic Water Level(m)	Discharge (m <sup>3</sup> /hr) (*1)	
N02	Faraba Sutu	33	12.39	21.86	31.68	Drinkable
N04	Batabut Kantora, Sikon, Arrangallen	38.8	22.50	25.60	10.42	Drinkable



Site No.	Site Name	Completion Depth (m)	Pumping Test			Water Quality As per result from laboratory
			Static Water Level(m)	Dynamic Water Level(m)	Discharge (m <sup>3</sup> /hr) (*1)	
N08	Ker Sulay+Ker Ali	80.4	25.93	38.26	20.31	Drinkable
N18	Jahawur Mandinka+Fula	76	12.40	16.51	34.43	Drinkable
N25	Brikamanding+Darsilami+Jamwelly+Sinchu Bamba+Sinchu Magai+Sinchu Madado Complex	52	7.70	19.21	16.50	Drinkable
N26	Teneng Fara Complex	60	14.83	38.76	5.33	Drinkable
N27	Sololo+Fuga+Dramman Complex	48	16.38	32.81	4.02	Drinkable

(\*1): Discharge rate of Constant Rate Pumping Test.

(2) List of Test Boreholes handed over to DWR and the villages

Based on the results of the test drilling, the boreholes to be handed over to DWR and the villages are listed in Table 2. The borehole drilled in N27 Sololo+Fuga+Dramman Complex is considered unsuccessful because the yield is too small (less than 5 m<sup>3</sup>/hr) for the piped water supply scheme.

Table-2 List of Test Boreholes Handed Over to DWR

Site No.	Site Name	Region	District	Coordinate	
				Latitude	Longitude
N02	Faraba Sutu	WCR	Brikama	N 1459789	E 0339189
N04	Batabut Kantora, Sikon, Arrangallen	WCR	Foni Bintang	N 1460545	E 0373653
N08	Ker Sulay+Ker Ali	NBR	Kerewan	N 1502443	E 0433618
N18	Jahawur Mandinka+Fula	CRR	Lower Saloum	N 1514214	E 0461086
N25	Brikamanding+Darsilami+Jamwelly+Sinchu Bamba+ Sinchu Magai+Sinchu Madado Complex	CRR	Lower Fulladou West	N 1496180	E 0507085
N26	Teneng Fara Complex	CRR	Janjanbureh	N 1505047	E 0496799

DWR, representatives of target villages of the test drilling, and the Survey Team confirmed that all test boreholes handed over to DWR and the villages were in good condition as shown in Annex-1 Photographs of Completed Test Boreholes. DWR and the villages will take all necessary measures to maintain and protect the test boreholes in coordination with the respective communities where the test boreholes are located.




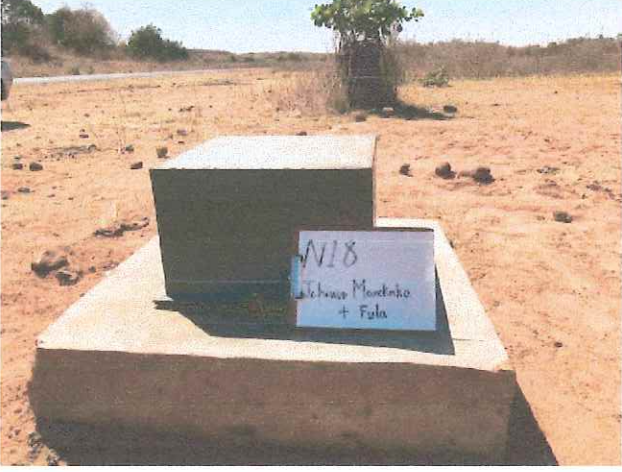


Annexes

Annex-1: Photograph of Completed Test Boreholes

Annex-2: Letter of Agreement for Maintaining and Protecting the Test Boreholes



Annex-1: Photograph of Completed Test Boreholes

	
<p>N02 Faraba Sutu</p>	<p>N04 Batabut Kantora, Sikon, Arrangallen</p>
	
<p>N08 Ker Sulay+Ker Ali</p>	<p>N18 Jahawur Mandinka+Fula</p>
	
<p>N25 Brikamanding+Darsilami+ Jamwelly+Sinchu Bamba+ Sinchu Magai+Sinchu Madado Complex</p>	<p>N26 Teneng Fara Complex</p>





N27 Sololo+Fuga+Dramman Complex



**Preparatory Survey  
on the  
Project for Rural Water Supply (Phase IV) in the Republic of the Gambia**

**Letter of Agreement**

This letter serves as an agreement for handover of responsibility of maintaining and protecting the test boreholes constructed between December 2018 and January 2019, under the "Project for the Preparatory Survey on the Project for Rural Water supply (Phase IV) in the Republic of the GAMBIA" by JICA Project Team.

DWR and the following Responsible Village are responsible for maintaining and protecting the test boreholes until the commencement of the construction of the facilities under the Project for making available the corresponding test borehole as a production well.

The Responsible Village (Site) name: Faraba Sutu

The Site Number (Borehole Number): N-02

Date: 21/01/2019

Date: 22/01/2019

Date: 22/01/2019

Sign: Alhagi Jabbi

Sign: [Signature]  
Name: Omar Dabo

Sign: [Signature]  
JICA Project Team  
Hydrogeological Survey 2 /  
Exploratory Drilling  
Survey 1  
Masatoshi Tanaka

Department of Water Resources  
Project Manager  
Alhagi Jabbi  
For Director

The above responsible village  
Village leader (Alkalo)  
Name:  
VDC - chairman

**THE DIRECTOR**  
DEPT. OF WATER RESOURCES  
KOROMBO & PARADE, BANJUL  
21-01-2019

Alhagi Sanyang  
SUTU VDC  
WR  
DATE 22/1/19  
KOMBO EAST DISTRICT  
M-57

Ken  
fc



**Preparatory Survey  
on the  
Project for Rural Water Supply (Phase IV) in the Republic of the Gambia**

**Letter of Agreement**

This letter serves as an agreement for handover of responsibility of maintaining and protecting the test boreholes constructed between December 2018 and January 2019, under the "Project for the Preparatory Survey on the Project for Rural Water supply (Phase IV) in the Republic of the GAMBIA" by JICA Project Team.

DWR and the following Responsible Village are responsible for maintaining and protecting the test boreholes until the commencement of the construction of the facilities under the Project for making available the corresponding test borehole as a production well.

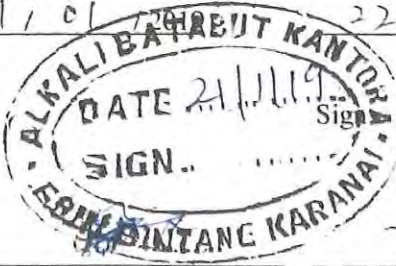
The Responsible Village (Site) name: Batabut Kanfara

The Site Number (Borehole Number): N04

Date: 21/01/2019

Date: 21/01/2019      Date: 21/01/2019

Sign: Alhagi Jabbi

Sign: 

Masatoshi Tanaka

Department of Water  
Resources  
Project Manager  
Alhagi Jabbi  
For Director

The above responsible village  
Village leader (Alkalo)  
Name: Alimami  
F Sanyang

JICA Project Team  
Hydrogeological Survey 2/  
Exploratory Drilling  
Survey 1  
Masatoshi Tanaka

**THE DIRECTOR**  
DEPT. OF WATER RESOURCES  
21.01.2019

VDC - chairman  
Landing Sanyang  
Sanyang

fe



**Preparatory Survey  
on the  
Project for Rural Water Supply (Phase IV) in the Republic of the Gambia**

**Letter of Agreement**

This letter serves as an agreement for handover of responsibility of maintaining and protecting the test boreholes constructed between December 2018 and January 2019, under the "Project for the Preparatory Survey on the Project for Rural Water supply (Phase IV) in the Republic of the GAMBIA" by JICA Project Team.

DWR and the following Responsible Village are responsible for maintaining and protecting the test boreholes until the commencement of the construction of the facilities under the Project for making available the corresponding test borehole as a production well.

The Responsible Village (Site) name: Ker Sufay + Ker Ali

The Site Number (Borehole Number): N-08

Date:

21 / 01 / 2019

Date:

23 / 01 / 2019

Date:

22 / 01 / 2019

Sign:

Alhagi Jabbi

Department of Water  
Resources  
Project Manager  
Alhagi Jabbi  
For Director

Sign:

Ismaila Jallow

The above responsible village  
Village leader (Alkalo)  
Name:

Ismaila  
Jallow

Sign:

Masatoshi Tanaka

JICA Project Team  
Hydrogeological Survey 2 /  
Exploratory Drilling  
Survey 1  
Masatoshi Tanaka



Aliou Bittaye

A4-5-9

KM

jc



**Preparatory Survey  
on the  
Project for Rural Water Supply (Phase IV) in the Republic of the Gambia**

**Letter of Agreement**

This letter serves as an agreement for handover of responsibility of maintaining and protecting the test boreholes constructed between December 2018 and January 2019, under the "Project for the Preparatory Survey on the Project for Rural Water supply (Phase IV) in the Republic of the GAMBIA" by JICA Project Team.

DWR and the following Responsible Village are responsible for maintaining and protecting the test boreholes until the commencement of the construction of the facilities under the Project for making available the corresponding test borehole as a production well.

The Responsible Village (Site) name: Jahawur mandinka + fulla  
(Jahawur fulla)  
The Site Number (Borehole Number): ~~N-18~~

Date: 21/01/2019

Date: 23/01/2019

Date: 22/01/2019

Sign: Alhagi Jabbi

Sign: 

Sign: Masatoshi Tanaka

Department of Water Resources  
Project Manager  
Alhagi Jabbi  
For Director

The above responsible village  
Village leader (Alkalo)  
Name: Hammadi Jallow

JICA Project Team  
Hydrogeological Survey 2/  
Exploratory Drilling  
Survey 1  
Masatoshi Tanaka

**THE DIRECTOR**  
DEPT. OF WATER RESOURCES  
MAXINA PARADE, BANJUL  
DATE: 21.01.2019

VDC - chairman  
Dawda Louson

  
A4-5-10

ku fe



**Preparatory Survey  
on the  
Project for Rural Water Supply (Phase IV) in the Republic of the Gambia**

**Letter of Agreement**

This letter serves as an agreement for handover of responsibility of maintaining and protecting the test boreholes constructed between December 2018 and January 2019, under the "Project for the Preparatory Survey on the Project for Rural Water supply (Phase IV) in the Republic of the GAMBIA" by JICA Project Team.

DWR and the following Responsible Village are responsible for maintaining and protecting the test boreholes until the commencement of the construction of the facilities under the Project for making available the corresponding test borehole as a production well.

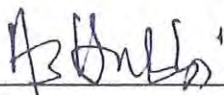
The Responsible Village (Site) name: Brikamanding Complex

The Site Number (Borehole Number): N 25

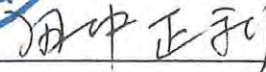
Date:  
21 / 01 / 2019

Date:  
22 / 01 / 2019

Date:  
22 / 01 / 2019

Sign:  


Sign:  

Department of Water  
Resources  
Project Manager  
Alhagi Jabbi  
For Director

The above responsible village  
Village leader (Alkalo)  
Name:  
Lamin Manjang

JICA Project Team  
Hydrogeological Survey 2 /  
Exploratory Drilling  
Survey 1  
Masatoshi Tanaka

**THE DIRECTOR**  
DEPT. OF WATER RESOURCES  
PARADE, BANJUL  
21. 01. 2019

VDC - Chairman  
Alimama Fatate





**Preparatory Survey  
on the  
Project for Rural Water Supply (Phase IV) in the Republic of the Gambia**

**Letter of Agreement**

This letter serves as an agreement for handover of responsibility of maintaining and protecting the test boreholes constructed between December 2018 and January 2019, under the "Project for the Preparatory Survey on the Project for Rural Water supply (Phase IV) in the Republic of the GAMBIA" by JICA Project Team.

DWR and the following Responsible Village are responsible for maintaining and protecting the test boreholes until the commencement of the construction of the facilities under the Project for making available the corresponding test borehole as a production well.

The Responsible Village (Site) name: Teneng fara Complex

The Site Number (Borehole Number): N-26

Date:

21/01/2019

Date:

22/01/2019

Date:

22/01/2019

Sign:

Alhagi Jabbi

Department of Water  
Resources  
Project Manager  
Alhagi Jabbi  
For Director

Sign:

Cundo Baldeh

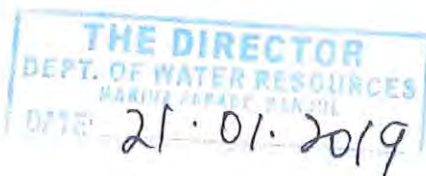
The above responsible village  
Village leader (Alkalo)  
Name:

Cundo Baldeh

Sign:

Masatoshi Tanaka

JICA Project Team  
Hydrogeological Survey 2/  
Exploratory Drilling  
Survey 1  
Masatoshi Tanaka



VDC - chairman.  
Sana Baldeh  
SB



**Preparatory Survey  
on the  
Project for Rural Water Supply (Phase IV) in the Republic of the Gambia**

**Letter of Agreement**

This letter serves as an agreement for handover of responsibility of maintaining and protecting the test boreholes constructed between December 2018 and January 2019, under the "Project for the Preparatory Survey on the Project for Rural Water supply (Phase IV) in the Republic of the GAMBIA" by JICA Project Team.

DWR and the following Responsible Village are responsible for maintaining and protecting the test boreholes until the commencement of the construction of the facilities under the Project for making available the corresponding test borehole as a production well.

The Responsible Village (Site) name: Sololo Mandinka Complex

The Site Number (Borehole Number): N 27

Date: 21/01/2019

Date: 22/01/2019

Date: 22/01/2019

Sign: Alhagi Jabbi



Sign: Kihim Geesay

Sign: Masatoshi Tanaka

Department of Water Resources  
Project Manager  
Alhagi Jabbi  
For Director

The above responsible village  
Village leader (Alkalo)  
Name:  
Kihim Geesay

JICA Project Team  
Hydrogeological Survey 2/  
Exploratory Drilling  
Survey 1  
Masatoshi Tanaka

**THE DIRECTOR**  
DEPT. OF WATER RESOURCES

21/01/2019  
VDC-chairman  
Musa Saady

*KM*

*fe*



