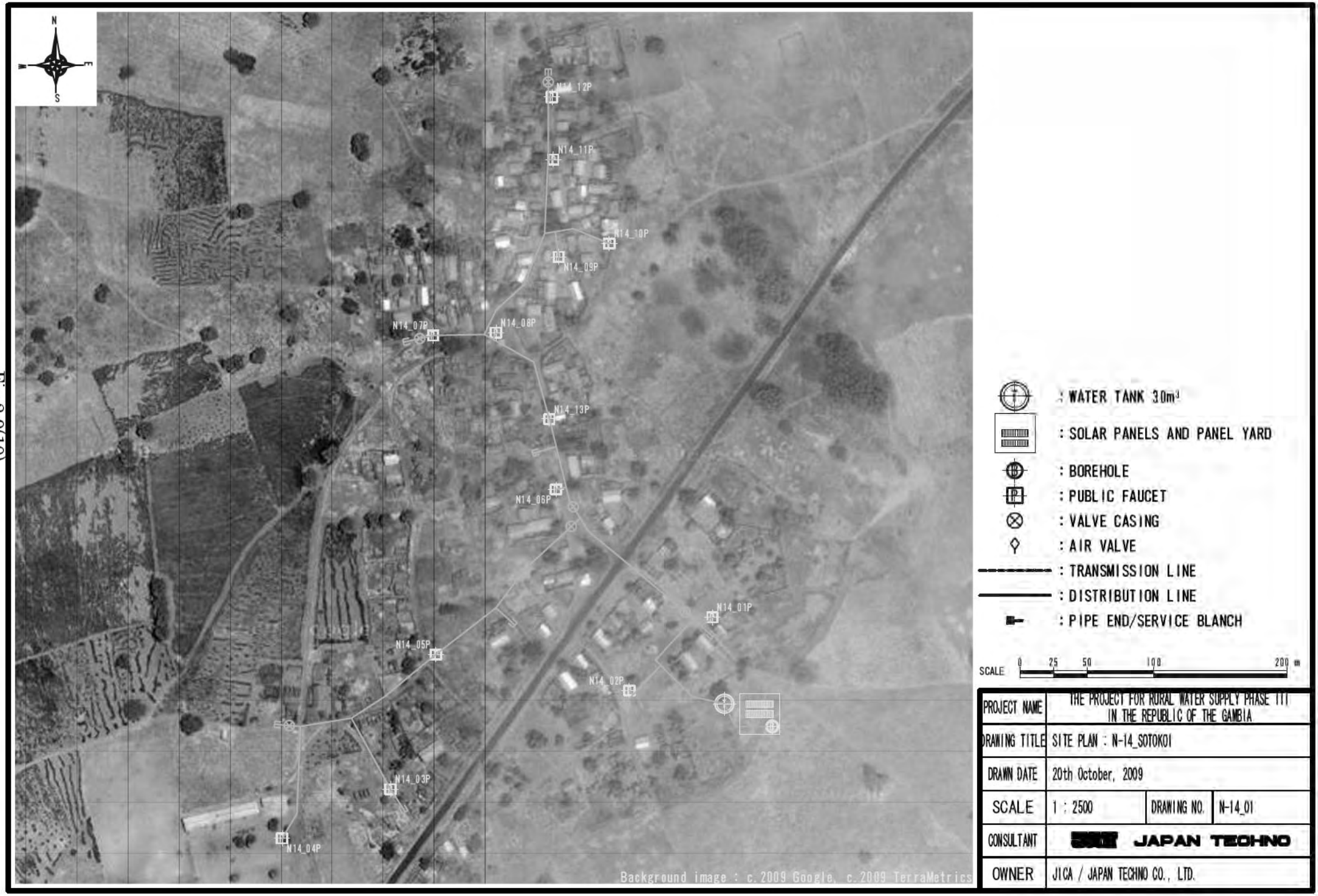
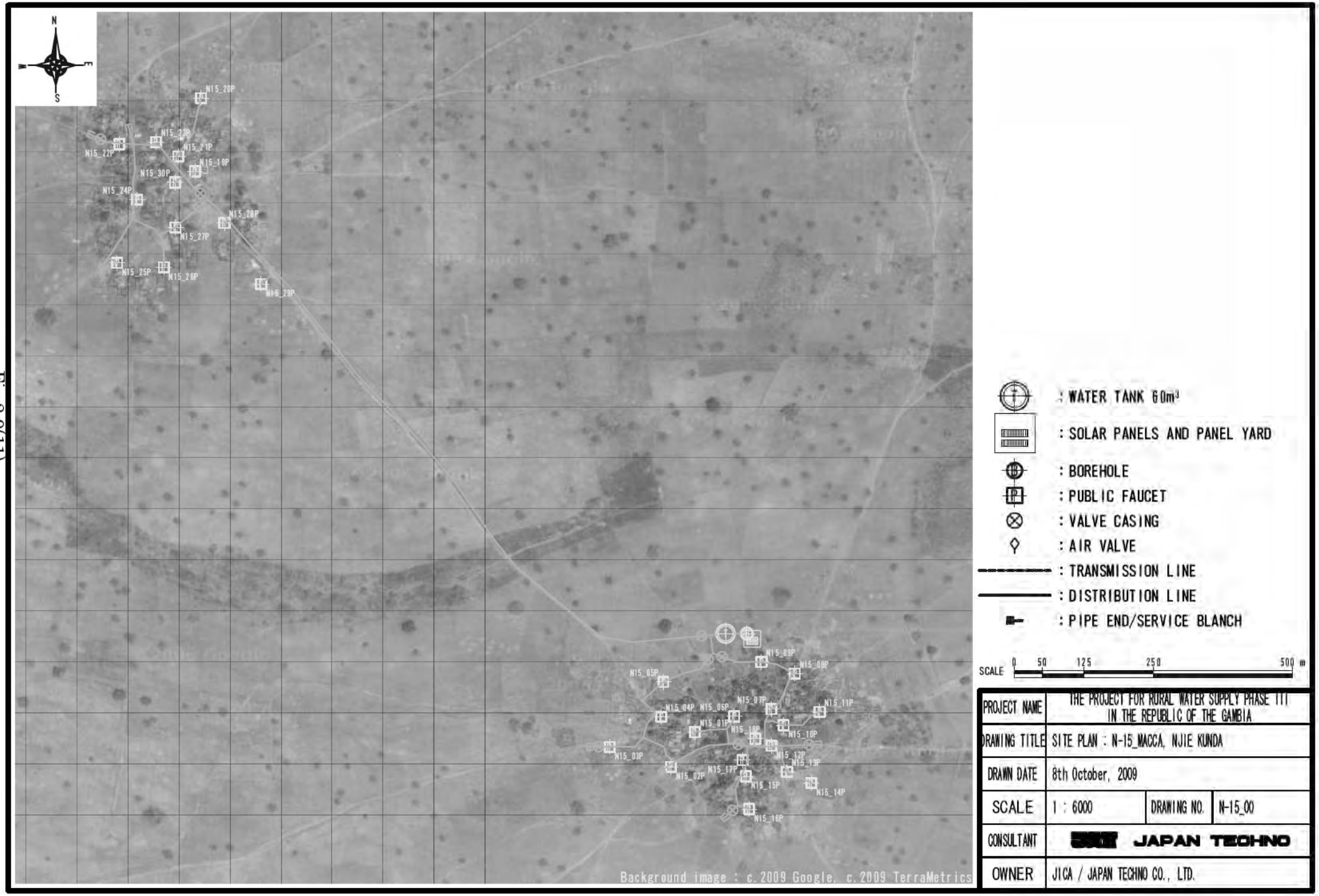


PROJECT NAME	THE PROJECT FOR RURAL WATER SUPPLY PHASE III IN THE REPUBLIC OF THE GAMBIA
DRAWING TITLE	SITE PLAN : N-14_SOTOKOI
DRAWN DATE	20th October, 2009
SCALE	1 : 2500 / DRAWING NO. N-14_01
CONSULTANT	JAPAN TECHNO
OWNER	JICA / JAPAN TECHNO CO., LTD.

Fig.2-9(10)



PROJECT NAME	THE PROJECT FOR RURAL WATER SUPPLY PHASE III IN THE REPUBLIC OF THE GAMBIA
DRAWING TITLE	SITE PLAN : N-15_MACCA, NJIE KUNDA
DRAWN DATE	8th October, 2009
SCALE	1 : 6000 / DRAWING NO. N-15_00
CONSULTANT	JAPAN TECHNO
OWNER	JICA / JAPAN TECHNO CO., LTD.

Fig.2-9(11)

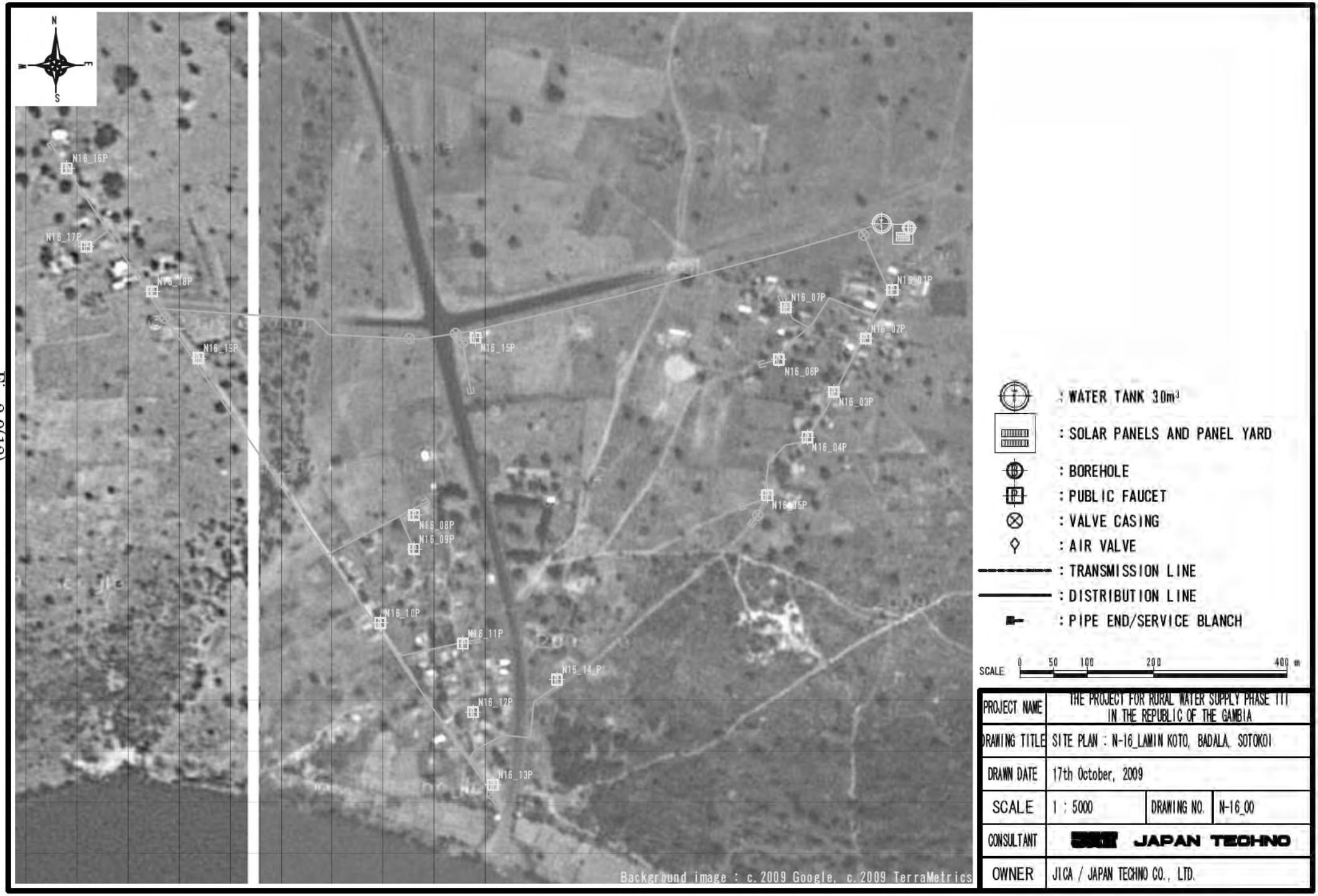
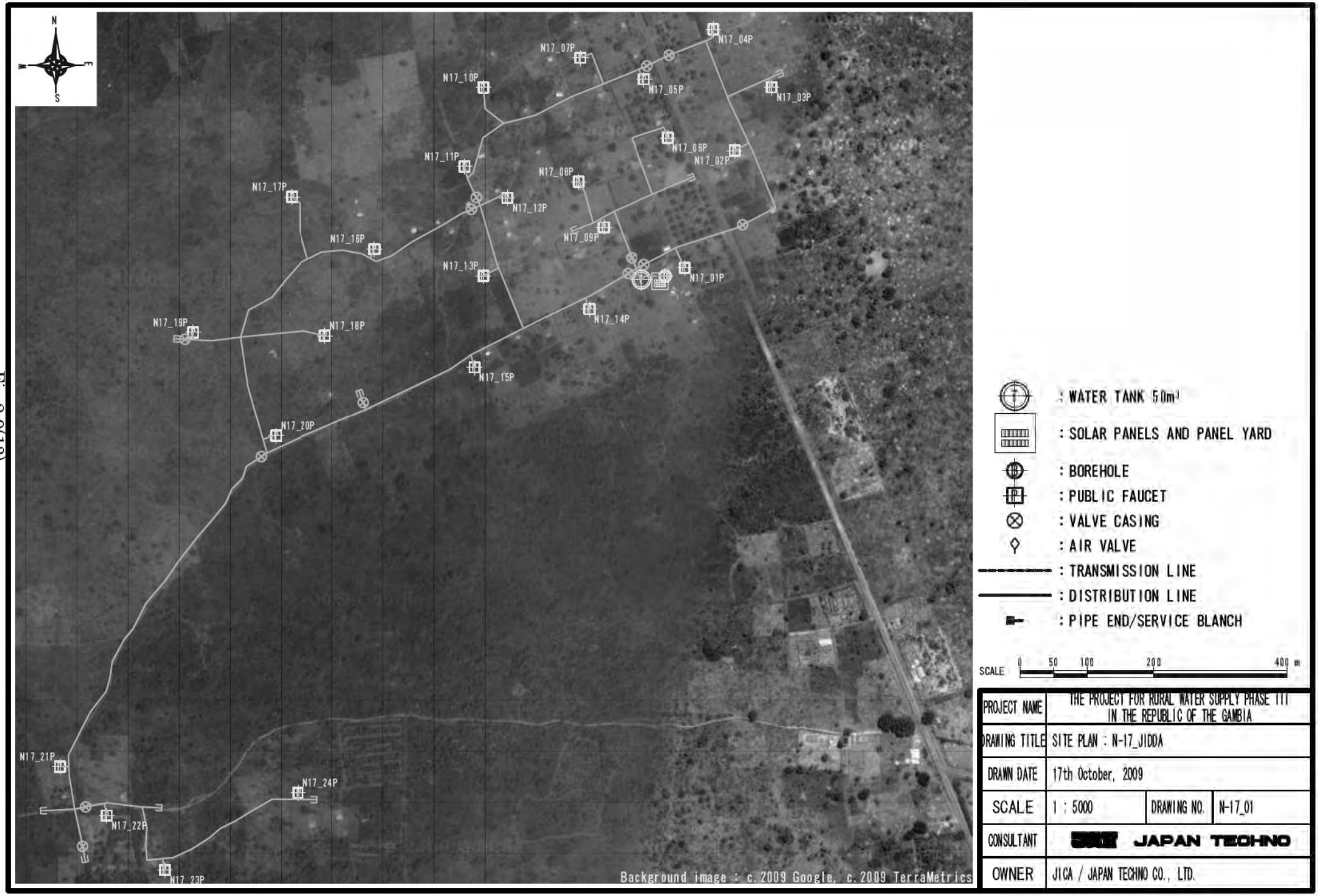

N
W
E
S
N16_16P
N16_17P
N16_18P
N16_19P
N16_15P
N16_01P
N16_07P
N16_02P
N16_06P
N16_03P
N16_04P
N16_05P
N16_08P
N16_09P
N16_10P
N16_11P
N16_14_P
N16_12P
N16_13P
: WATER TANK 30m³
: SOLAR PANELS AND PANEL YARD
: BOREHOLE
: PUBLIC FAUCET
: VALVE CASING
: AIR VALVE
: TRANSMISSION LINE
: DISTRIBUTION LINE
: PIPE END/SERVICE BLANCH
SCALE 0 50 100 200 400 m
Background image : c.2009 Google, c.2009 TerraMetrics
PROJECT NAME THE PROJECT FOR RURAL WATER SUPPLY PHASE III IN THE REPUBLIC OF THE GAMBIA
DRAWING TITLE SITE PLAN : N-16_LAMIN KOTO, BADALA, SOTOKOI
DRAWN DATE 17th October, 2009
SCALE 1 : 5000
DRAWING NO. N-16_00
CONSULTANT JAPAN TECHNO
OWNER JICA / JAPAN TECHNO CO., LTD.

Fig.2-9(12)



PROJECT NAME	THE PROJECT FOR RURAL WATER SUPPLY PHASE III IN THE REPUBLIC OF THE GAMBIA
DRAWING TITLE	SITE PLAN : N-17_JIDDA
DRAWN DATE	17th October, 2009
SCALE	1 : 5000 / DRAWING NO. N-17_01
CONSULTANT	JAPAN TECHNO
OWNER	JICA / JAPAN TECHNO CO., LTD.

Fig.2-9(13)
2-64

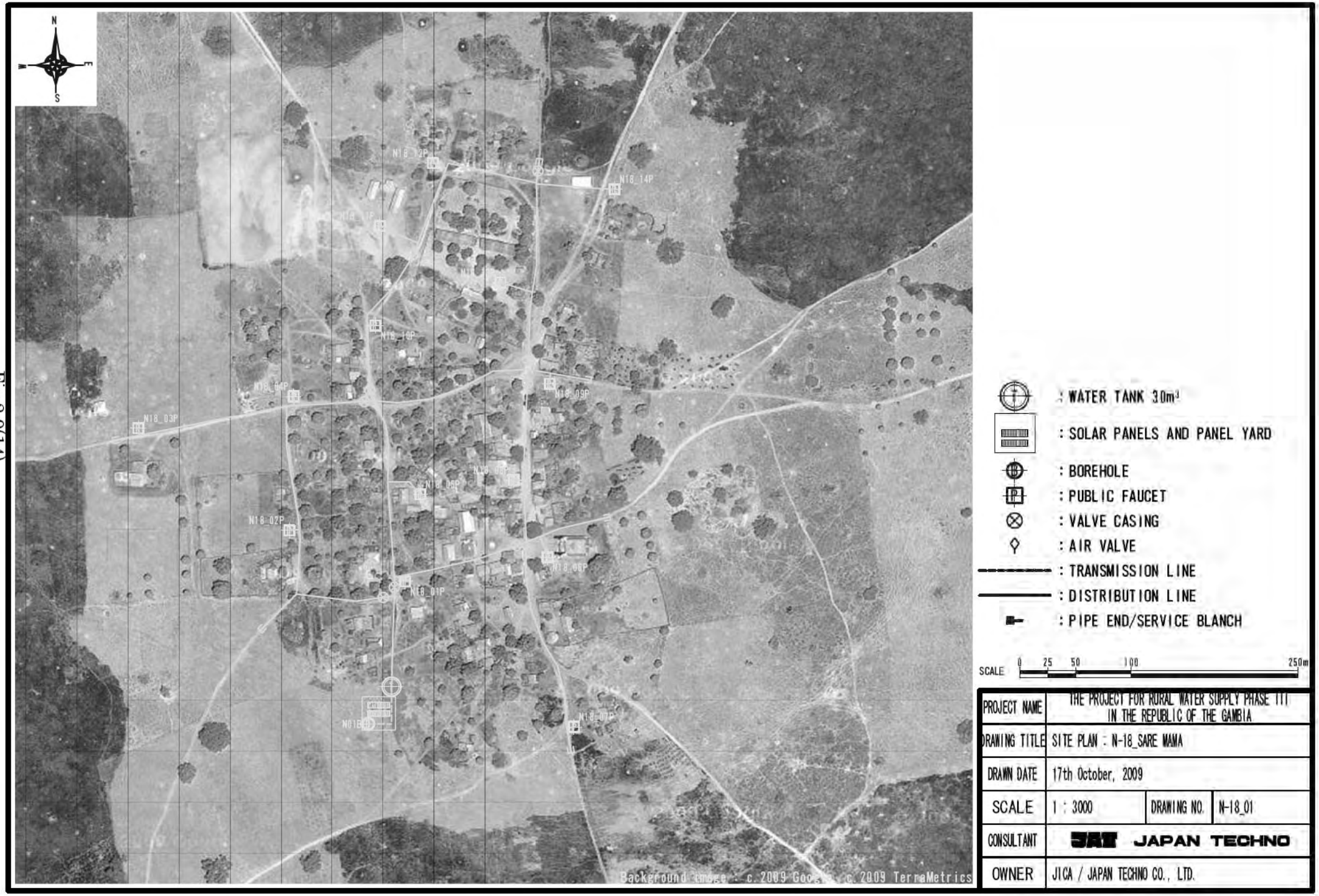

N
W
E
S
N18_12P
N18_14P
N18_10P
N18_04P
N18_03P
N18_09P
N18_05P
N18_02P
N18_06P
N18_01P
N18_07P
N01B
: WATER TANK 30m³
: SOLAR PANELS AND PANEL YARD
: BOREHOLE
: PUBLIC FAUCET
: VALVE CASING
: AIR VALVE
: TRANSMISSION LINE
: DISTRIBUTION LINE
: PIPE END/SERVICE BLANCH
SCALE 0 25 50 100 250m
Background image : c.2009 Google, c.2009 TerraMetrics
PROJECT NAME THE PROJECT FOR RURAL WATER SUPPLY PHASE III IN THE REPUBLIC OF THE GAMBIA
DRAWING TITLE SITE PLAN : N-18_SARE MAMA
DRAWN DATE 17th October, 2009
SCALE 1 : 3000
DRAWING NO. N-18_01
CONSULTANT JAT JAPAN TECHNO
OWNER JICA / JAPAN TECHNO CO., LTD.

Fig.2-9(14)

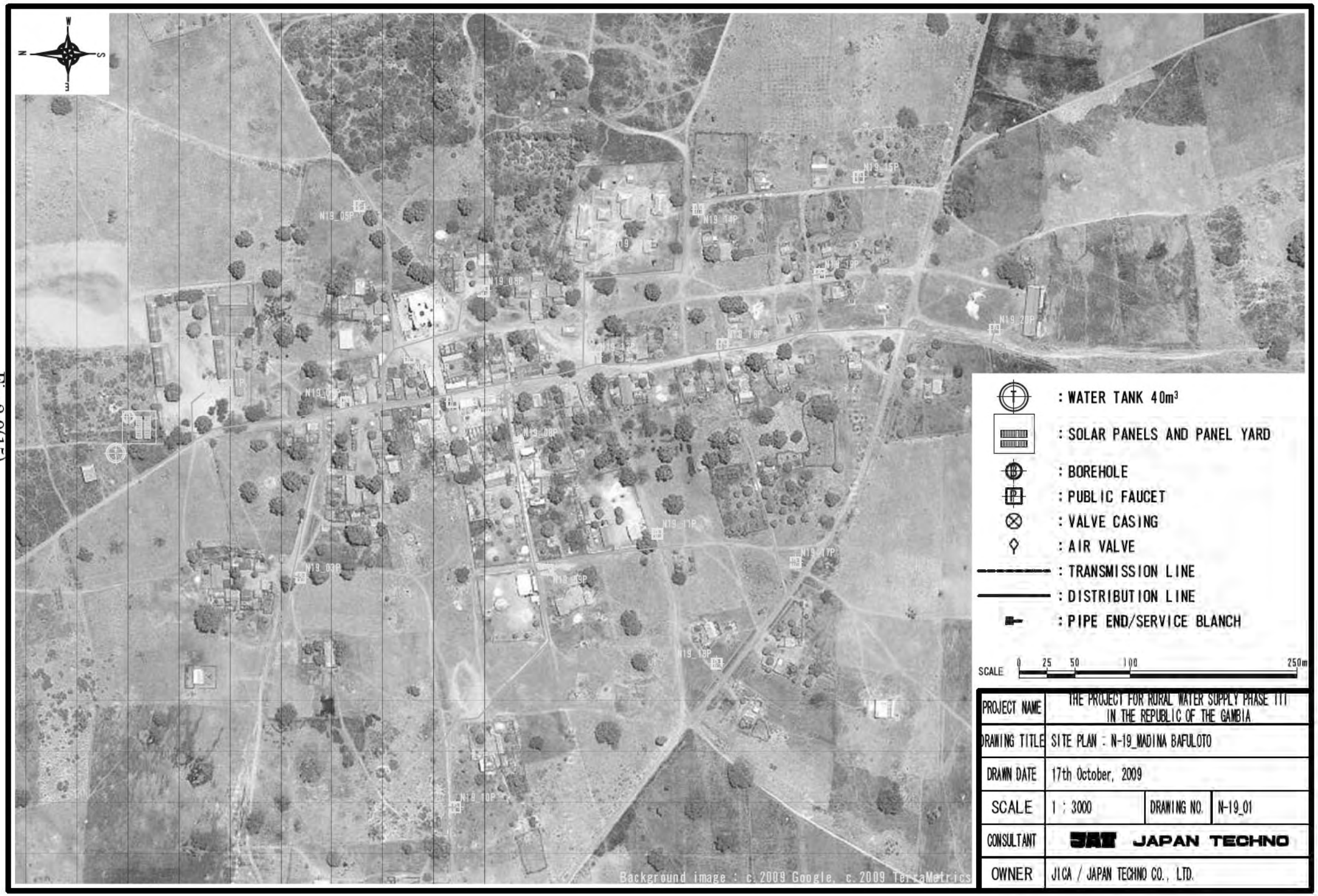

N19_05P
N19_06P
N19_08P
N19_14P
N19_15P
N19_19P
N19_20P
N19_16P
N19_11P
N19_17P
N19_09P
N19_03P
N19_13P
N19_10P
: WATER TANK 40m³
: SOLAR PANELS AND PANEL YARD
: BOREHOLE
: PUBLIC FAUCET
: VALVE CASING
: AIR VALVE
: TRANSMISSION LINE
: DISTRIBUTION LINE
: PIPE END/SERVICE BLANCH
SCALE 0 25 50 100 250m
PROJECT NAME THE PROJECT FOR RURAL WATER SUPPLY PHASE III IN THE REPUBLIC OF THE GAMBIA
DRAWING TITLE SITE PLAN : N-19_MADINA BAFULOTO
DRAWN DATE 17th October, 2009
SCALE 1 : 3000
DRAWING NO. N-19_01
CONSULTANT JAT JAPAN TECHNO
OWNER JICA / JAPAN TECHNO CO., LTD.
Background image : c.2009 Google, c.2009 TerraMetrics

Fig.2-9(15)

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

In this Project, a Japanese company will be the prime contractor which will have the technical and economical responsibilities to complete the Project under the supervision of the Consultant of Japan. The construction works will be done under the responsibility of the Japanese company in managing local companies in The Gambia and/or directly undertaking the work. Except for the works of solar-powered pumping system installation and construction of boreholes, all the works in the Project will be done by using local workers employed by the Japanese constructor, but it is not planned to subcontract the facility construction works at present. The experienced technicians who will be essential for quality control are wanting in The Gambia. In the CBR tests and crossing culvert concrete works at the sites of road construction project implemented by a general contractor under Dutch fund, the skilled technicians dispatched from the Netherlands were engaged in quality control of the works. In the Project, therefore, skilled technicians will also be dispatched from Japan and they will manage the work particularly for the period of form placing to curing concrete in the concrete works for reservoirs for which perfect quality control will be required. Similarly, the construction management for excavation, pipeline laying and back-filling as well the pipeline laying works will be carried out by Japanese engineers. The organizational and functional diagram of the Project implementation system is shown in Fig. 2-10.

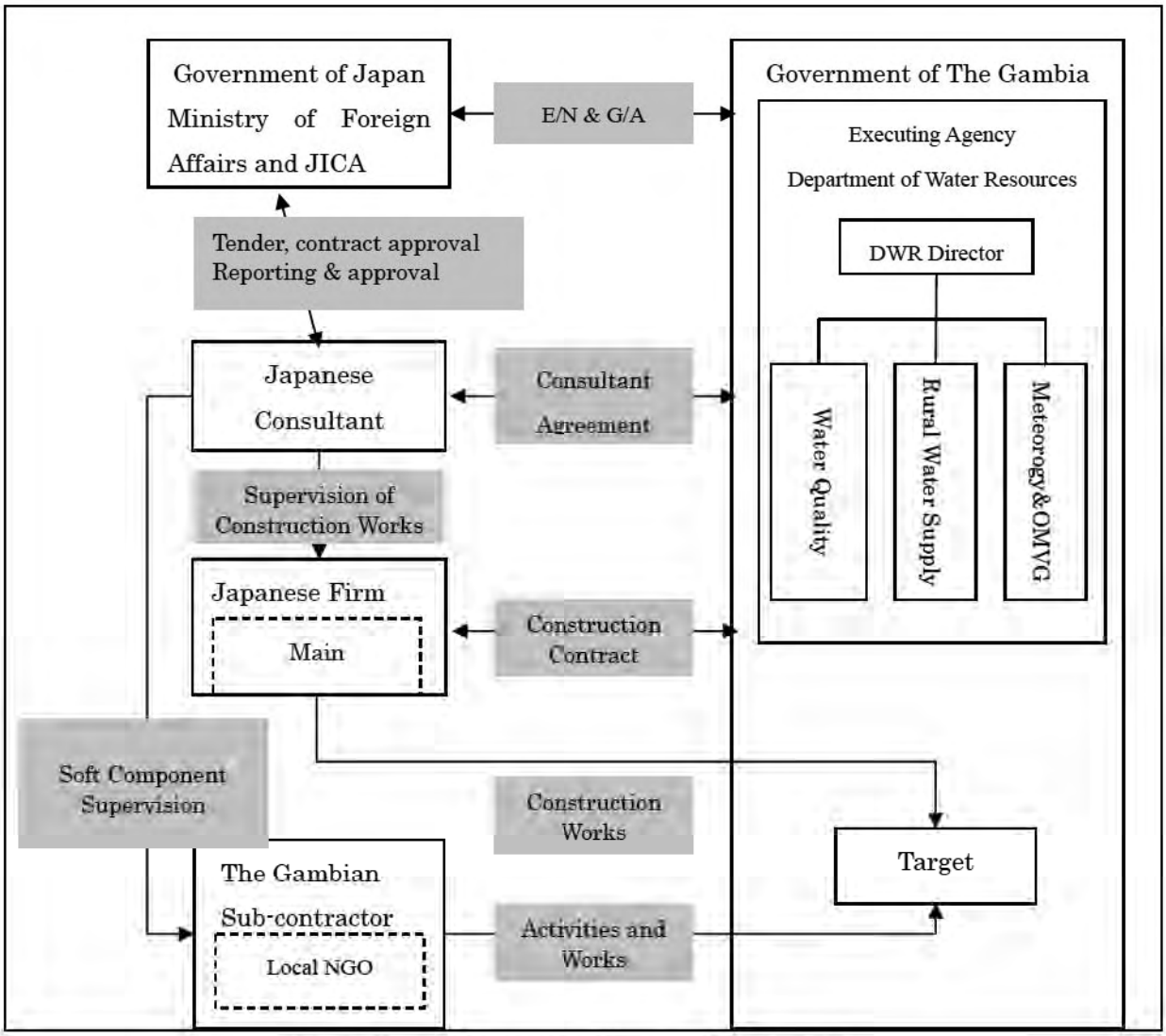


Fig. 2-10 Implementation System of the Project

2-2-4-2 Implementation Conditions

1. It may be difficult to implement the works in the rainy season from July to September because the unpaved access roads are flooded. The work schedules will be supervised in considering the accesses to project villages.
2. The quality control of concrete will be carried out with the highest standard in order to construct structures with high durability.

2-2-4-3 Scope of Works

(1) Responsibilities of the Japanese Side

1) Construction of boreholes, new piped water supply facilities, and conversion of existing water supply facilities.
2) Organization of the operation and maintenance system by three parties "Residents – the OM Companies – Administrative Agency" by Soft Component in order to ensure the sustainable operation and maintenance of the piped water supply facilities to the newly constructed or converted systems.
3) Procurement of geophysical prospecting equipment

(2) Responsibilities of The Gambian Side

1. Land acquisition necessary for construction of facilities and construction of work access roads from main roads to planned sites in project villages.
2. Provision of temporary yards that will be used by the constructor during the work period.
3. Measures for prompt tax exemption and customs clearance in The Gambia that will be necessary for implementation of this Project construction works.

2-2-4-4 Consultant Supervision

The Project to be implemented as a grant aid assistance project will be undertaken by a consultant company of Japan from the detailed design to the supervision of procurement and construction works. At the start of the construction works, the Consultant will dispatch a resident engineer in charge of work supervision to The Gambia, who will attend the pre-shipment inspection of the equipment procured in Japan and be stationed in The Gambia to supervise the works ranging from borehole drilling to construction of piped water supply facilities and also supervise the quality, schedules and workmanship of each work.

The resident engineer will carry out spot supervision of Soft Component activities, educational activities, hygiene education and operation and maintenance management in order to complement the works of the personnel in charge if such personnel are off duty. The work items of the consultant company of Japan for the Project are shown in Table 2-28.

Table 2-28 Scope of Works for the Japanese Consultant

1.	Before the Construction and Procurement Stage	1)Detailed Design Survey 2)Tender Document Preparation 3)Tender Organisation 4)Evaluation of Tender Results 5)Support of Contract Conclusion
2.	The Construction and Procurement Stage	1)Construction Supervision 2)Procurement Supervision 3)Support for Soft Component 4)Report Writing

2-2-4-5 Quality Control Plan

The details of quality control and tests in the Project are described below.

(1) Quality Control and Checking of Equipment and Materials

The equipment and materials for use in construction works will mainly be procured in The Gambia. The quality control of such equipment and materials will be carried out in the following procedure:

1) The procurement manager of the prime contractor will check the quality of equipment and materials by inspecting the samples thereof.
2) The site managing engineers such as civil/architecture engineers will make the quality check, inspection of the equipment and materials when they arrived at each site.
3) The resident engineer of the Consultant and the representative of DWR will inspect the appearance and quantities of the equipment and materials before construction, arrangement and installation, as well as confirm that the equipment and materials have the accepted quality.
4) The prime contractor will submit necessary documents including factory quality test data and strength test data for checking the quality control of the equipment and materials.

(2) Borehole Drilling Works

- Check the equipment and materials to be used, workers and their technical experience, and work schedules in making the use of local companies.
- Make the geological sampling for each drilling of 2m and for each change of layer and monitor the changing hydrological and geological conditions.
- Make the borehole electric logging and determine each position of screen installation, which will be determined by a Japanese drilling engineer.
- Check on the quality of casing pipes, screen, packing gravels and installation.
- Make the pumping tests and analysis under the supervision of the drilling engineer and acquire the approval by the Consultant.
- Collect water samples just before the end of the continuous pumping test in the final stage of the pumping test and make the water quality analysis.
- Collected water sample will be tasted by village representatives on whether drinkable or not at each site.

(3) Concrete Works

There is no quality standard for concrete in The Gambia. However, the European standards are generally adopted in similar projects implemented by other donors. In the Project, quality control will be conducted in accordance with the applicable European standards and/or the quality control standards of Japan equivalent to the applicable European standards.

1) In the design mixture for concrete, trial mixing will be executed. In the trial mixing, samples will be collected for the 7-day strength test and the 28-day strength test on the samples also to be conducted at a public testing laboratory of Gambia Technical Training Institute (GTTI) of The Gambia.

Table 2-29 Concrete Tests

Type of Test	Standard Value	Place of Testing
Chloride concentration test	0.3kg/m^3 or less	Site
Air ratio test	4 – 7% ± 1.5%	Site
Slump test	8cm ± 2.5cm	Site
Aggregate grading distribution test	Sieve analysis	Laboratory
Aggregate specific gravity (density) test	2500kg/m^3 or more	Laboratory

2) In the slump test, the workability at each concrete placing point (water tank wall or post) will be considered to determine the aggregate ratio and water-cement ratio, then to establish an appropriate slump value (approx. 8cm ± 2.5cm).
3) In the concrete mixture control, the trial mixing at the compressive strength of each procured material will be carried out. As the result, the mixture of concrete for the forma placing will be determined and acquire the approval by the Consultant.
4) In placing concrete at each facility site, the field test will be conducted for each batch and test pieces will be sampled to make the concrete compressive test as in Table 2-30.
5) The mixing using the portable mixer in this Project does not comply with the provisions of the Construction Edition of the Standard Concrete Specification (issued by Japan Society of Civil Engineers and Architectural Institute of Japan). Therefore, the slump value and other values can not be specified before the work. The slump value is different from material to material, and the contractor has to make trial mixing and check the appropriate results of workability and strength tests. Then, the contractor has to formulate an appropriate mixture plan to determine the standard slump value.
Therefore, it is not realistic to apply the number of test frequency cycles as specified in the technical standard document. The test frequency cycles will be applied to per change of material and each point of placing once a day at least.

Table 2-30 Concrete Compressive Strength Test

Test Item	Test Point	Design Nominal Strength	Test Frequency Cycles	Remarks
Trial mixing	—	15N/mm^2 21N/mm^2 24N/mm^2	All the trial mixing	• Prepare 6 samples or more for the same test material in each cycle of strength test. • Make the compressive strength test on three (3) samples of each test material at least in 7 days and 28 days of material age. • The test result of one sample shall be 85% or more of the design nominal strength and the average value of test results of 3 samples shall be the design nominal strength or more for acceptance.
Distribution reservoir	Levelling concrete Foundation post Underground beam Post Water tank bottom plate Water tank side wall Water tank top plate	15N/mm^2 21N/mm^2 21N/mm^2 21N/mm^2 24N/mm^2 24N/mm^2 24N/mm^2	Once per placing batch at each distribution reservoir	
Public water tap	Levelling concrete Framework	15N/mm^2 21N/mm^2	Per change of material	

6) Concrete placing and curing

The daily average temperature in The Gambia is higher than 25ºC throughout the year and the hot-weather concreting is normally made. The hot-weather concreting measure for this Project is as follows:

- To avoid the deterioration of concrete quality due to a high temperature, the quality control of materials, mixture, placing and curing of concrete will be implemented thoroughly under the guidance and supervision of expert engineers.
- In the trial mixing stage, the mixture design will be conducted for the hot-weather concreting conditions, and the unit water quantity and unit cement quantity will be minimized within the range in which the required strength and workability are available.
- The time until the end of placing will be 1.5 hours or less as a rule. The placing time will be adjusted in considering the temperature at the placing time in the morning and in the evening.
- The components such as frameworks and the ground which may absorb water content from concrete will be kept in a wet state before placing concrete. If the frameworks or reinforcing bars may be heated by direct sunlight, an appropriate measure such as water sprinkling or covering will be taken.
- The concrete temperature will be measured before placing concrete and if the temperature exceeds 35ºC, the placing work will be suspended.
- When the concrete placing work is finished, the curing will be started promptly and the concrete surface will be protected against drying. In particular, when the temperature is high and the humidity is low, cracks may be caused by rapid drying immediately after placing. The concrete surface will be covered to prevent the

direct sunlight and winds and kept in a wet state by water sprinkling.

- The time until the end of placing will be 1.5 hours or less as a rule.

(4) Reinforcing Work

For quality control of reinforced concrete works, the submission of the following documents will be required by the prime contractor:

① Type and kind of reinforcing bar and name of manufacturer
② Quality assurance certificate (MIL sheet) or tension test data
③ The reinforcing bars to be machined at the same size and in the same form will be machined in a batch at the yard of the site office under the supervision of a Japanese managing engineer in order to secure the quality for bending, and transported to each site as a rule.
④ The reinforcing bars will be cleaned and any adhered objects such as floating rust to deteriorate concrete quality will be removed and the bars will be fixed and assembled not to move off in placing concrete. The nodes of intersection will be bundled by iron wires firmly. Mortar- or concrete-made spacers will be arranged to keep the covering with a framework properly.
⑤ After assembling, the inspection will be conducted in the presence of the Consultant and it will be checked that the bar arrangement and quantity are right as specified in the Design Documentation.

(5) Plumbing Work

1) There is no quality standard for plumbing materials in The Gambia. However, the European standards (including DIN) are generally adopted in similar projects by other donors. In the Project, quality control will be carried out in accordance with the applicable European standards and/or the Japanese standards equivalent to those standards.
2) For the plumbing materials, the total inspection will be conducted including visual check and temporary coupling of joints and valves. In the plumbing works, both types of PVC pipe and stainless steel pipe will be adopted. Those types of pipe will be used for the following categories:
   - PVC pipe: Pressure resistance 0.9Mpa; Conveyance/distribution pipe (40 – 110mm)
   - Stainless steel pipe: Pressure resistance 1.0Mpa; Conveyance pipe (exposed pipe/machinery house pipe), Elevated water tank pipe
   - Valves: Pressure resistance 1.0Mpa

3) The water pressure test will be conducted before back-filling after laying pipes in order to check whether there is a water leakage. The testing method is to increase the pressure up to the specified pressure resistance and to check that the pressure drop after one hour is within 10%.
4) After the tests are completed, the pipes will be subject to anti-bacterial treatment.

2-2-4-6 Procurement Plan

In the Project, the equipment and materials for construction works will be procured in The Gambia unless there is any trouble with their quality and quantities.

Main construction materials (such as reinforcing bars, cement and frameworks) can be procured within the country of The Gambia, but the pipe materials which are also included in the main materials, especially those exceeding the nominal diameter of 110 are not commercially available even in the capital city of The Gambia, Banjul. Therefore, such large-diameter pipes will be procured from any third country (such as Senegal) or other surrounding countries, and the procurement plan will be formulated in considering the procurement lead time.

Solar pumping tools are marketed and installed by multiple companies in The Gambia as one component unit of conveyance pipeline equipment (solar panel, inverter, power distribution board, submersible motor pump, pumping pipe and other necessary materials). Therefore, those tools can be ordered as a package from the vendors in The Gambia.

On the other hand, the geophysical prospecting equipment to be procured from Japan will be inspected before shipment in Japan and when the equipment is arrived at Banjul, The Gambia and passes the customs clearance, the functional and quality inspection of such equipment will be conducted in the presence of the Consultant before the equipment is delivered to DWR. The Consultant may eventually attend the outdoor test operation.

The countries from which the main equipment and materials will be procured for this Project are shown in Table 2-31.

Table 2-31 Classification of Origin of Equipment and Materials

Construction Equipment & Materials	Origin of Procurement		
	The Gambia	Japan	Third Country
Cement, gravel, Concrete block, etc.	○	–	–
Casing, screen, packing gravels	○	–	–
Reinforcing bar	○	–	–
Pipes, valve	○	–	△
Solar pumping system	○	–	–
Geophysical resistivity survey equipment	–	○	–

2-2-4-7 Operational Guidance Plan

1) One set of geophysical prospecting equipment will be procured from Japan. It is groundwater survey equipment and when it is delivered to DWR through the contractor, the operational guidance will be provided by the Consultant.
2) For the solar-powered pumping system, the contractor will, through its local agent, select a local company in The Gambia with which it will enter into a contract for installation, maintenance and operation. After the installation work is completed, the system will be inspected by DWR and the operational guidance will be provided after delivery of the system to each VWC (Village Water Committee).
3) The maintenance and operation agreement for Soft Component assistance will be executed between the VWC and the maintenance service company, and after the trial operation of one month, the collection of water charges at measured rates based on the supplied water volume will be commenced.

2-2-4-8 Soft Component (Technical Assistance) Plan : (Interventions for Capacity Building and Institutional Strengthening)

1. Programme Background

(1) Current Situation of the Recipient Country and Background of the Project

In The Gambia, under the principle of the cost recovery by the beneficiaries, the community-based OM (Operation and Maintenance) system has been adopted in rural water supply sector. In this system, communities have responsibility to pay the water tariff, while DWR provides communities with the technical support for the operation of the facilities and the organisational management. Regarding the solar pumping system, the maintenance service company makes a contract with communities and provide maintenance service for them. In this way, the tripartite OM system consisting of the beneficiary community, the OM company and DWR has been established in the country. Sustainability of the system is being enhanced based on review of the relevant policies and lessons learnt from the past experiences in implementation of the similar projects. This progress is attributed to the gradual introduction and revision of OM system through some twists and turns in execution of the contract between the communities and the maintenance service company under supervision of DWR.

(2) Rationale for Implementation of the Soft Component Programme

With regard to OM of the solar-powered water supply facilities to be constructed in the Project, the following problems were identified in the Preparatory Survey. The first category explained in 1-1 below is problems which will undermine sustainability of outcomes of the

cooperation. Meanwhile, problems described in 1-2 will hinder the smooth launch of the operation of the water schemes to be constructed in the Project. In order to cope with these problems and to achieve the Project objectives, the Soft Component programme is to be implemented as an accompanying measure for construction of the water supply facilities in the Project.

1-1. Capacity of the Target Communities

VWCs are primarily responsible for OM of the water supply facilities. The committee is therefore, required to be formed at each target site and be equipped with knowledge and skills necessary for OM. Though VWCs exist at the target communities, they have neither knowledge nor experience on OM of the solar-powered water supply system except for the committees at three sites in which existing water schemes with diesel generator will be converted to the solar-powered one under the Project. Even, the above-mentioned three sites with the diesel generator-driven systems do not have skills concerning on OM of the solar-powered water supply system. Therefore, capacity building of VWCs in all the target sites is required for the committee members to acquire skill necessary for OM activities.

Besides, there are some sites where the community members do not show enough willingness-to-pay for the water tariff and have poor awareness on sanitation and hygiene. Facilitation to raise their awareness is required in order to realise sustainable OM of the water supply facilities based on the principle of cost recovery by the beneficiaries, these activities aiming at improvement of the community-based OM system need to be implemented along with the schedule of the construction works from the start to the end.

1-2. Public Private Partnership

Effective measures are required to facilitate the communities, private OM companies, and the government involved in OM of the water supply facilities in the target sites to reconfirm and play their roles properly, and build a relationship of trust among them. In the Preparatory Survey, some cases were observed that these stakeholders did not follow the Policy on Management and Sustainability of Rural Water Supply and solar maintenance contract. From the past experience in management of OM system, some issues have been pointed out such as;

- insufficient supervision and monitoring by the government,
- negligence by the service companies in reporting to the government, and
- weak relationship between the service companies and communities which have been caused by delay in the repair works by the former and late payment by the latter.

This situation has affected smooth execution of the water supply services. Therefore, strong relationship needs to be established among the stakeholders who are supposed to be involved in

OM at each target site through sufficient and constructive dialogues so that they understand their roles and responsibilities.

2. Programme Objective

The objective of the Soft Component in this Project is to organize the OM system based on the tripartite cooperation between the community, the OM companies, and government. The water supply facilities are operated and maintained in a sustainable way under the initiative of VWC. This measure will help achieve the Project objective that the water supply facilities constructed under the Project enable the community members to access to safe and stable water supply. It is also expected to ensure sustainability of the effect which will be brought through the increased access to the safe water supply by the target communities.

3. Outputs of the Programme

The anticipated outputs of the Soft Component are explained below.

Output 1: The community-based OM system of the water supply facilities is established in the target sites.

In accordance with the OM plan of the water supply facilities constructed or rehabilitated in the Project, VWCs will be reorganised and training will be provided to the committee members concerning the knowledge and skills of OM of the solar-powered water supply facilities. An operation plan of the water scheme will be formulated by each VWC through these activities for restructuring of existing VWCs and capacity building of the committee members. It will contain a) regulations of VWC, b) financial management plan including collection of OM fund, opening of a bank account, and rules on financial report, c) policy to employ an operator and a watchman, and d) rules on use and maintenance of the public faucets.

It is also required that the target communities will sign the declaration of commitment to maintenance of the water scheme witnessed by representative of DWR and the Area Council and raise agreed amount of the initial contribution for the OM fund prior to the launch of the construction works.

Output 2: Foundation of the mutual confidence among the community, maintenance service provider and government is built in OM of the water supply facilities by understanding and recognising their roles and responsibilities each other.

In accordance with the decentralisation policy, responsibilities for OM of the rural water supply will be transferred to LGAs (Local Government Authorities) in the long term. In the viewpoint of this situation, involvement of LGAs in OM activities will be facilitated gradually in the Project under the technical support of DWR in order to enable various actors in the

region and the local government side to understand their roles properly.

The current OM system in The Gambia has taken the process of improvement by addressing problems of each site with efforts of the communities and private and public sectors. Following this experience, OM system will be established in the Project with enhancing preparedness of the communities for the constructive dialogue with other stakeholders.

Prior to facilitation of the solar maintenance contract at the target sites, sufficient explanation will be provided to the communities in order for them to understand the framework of OM system of the solar-powered water supply facilities according to the policy adopted in 2008 by the government. Especially, purposes and advantages of the Collective Maintenance Fund (CMF) are to be emphasised.

Output 3: The community members firmly understand importance and ways of safe and efficient use of water from the constructed water supply facilities.

Transformation of awareness and behaviour of the community members will be facilitated in terms of safe and effective use of water supplied from the constructed water supply facilities.

Regarding the safe use of water, residents in the target communities will be able to access to the protected water sources to be developed in the Project, which will expedite decline of use of unsanitary water sources for drinking. Furthermore, it is expected that the health conditions of the community members as well as the household and personal hygiene will be improved through appropriate and safe use of water by them. In order to realise these positive impacts, several conditions need to be in place such as proper understanding on and practice of utilisation and management of safe water as well as sense of ownership of the communities. Therefore, hygiene promotion activities will be conducted in the Project to enhance improvement of environmental sanitation and proper hygiene practices.

Concerning the effective use of water, it is expected that the community members will improve their practice of protection of water sources and awareness on costs to be borne for the water consumption. Since the subscription fee to be charged by the maintenance service provider is determined based on the water volume consumed from the constructed water supply facilities in the community, water consumption by each community member will directly affect the amount to be billed. Therefore, the community members are required to understand that waste of water and consumption of large amount of water for animal watering and gardening will result in unnecessary increase of OM costs to be borne by the user community. The Project will promote the community members to have proper understanding on capacity of the constructed water supply facilities and importance to control usage of each water sources as well as prevention of waste of supplied water. Utilisation of existing water facilities for such purpose

apart from the domestic use will also be advised to the communities as well as proper operation of communal taps.

Output 4: Monitoring and supervision system of the maintenance activities conducted by the target communities and private service providers are reinforced at the public sector, i.e. DWR and the local authorities.

It is required that DWR and the Area Councils will monitor a) impacts of the activities to support capacity building of the communities in OM and b) fund raising of maintenance fund and payment of the water tariff by the user communities, and periodical maintenance as well as repair works of troubles/damages in solar pumping system by the private OM companies based on the contract. Those records need to be saved in a database at the DWR and Area Councils to be referred to and utilised for sustainable OM of the Project and formation of the new projects in future.

In the Project, TAC-MDFT (technical advisory committee-multi disciplinary facilitation team) in each LGA will be involved in monitoring and supervision of OM activities at the community level. DWR will provide technical support and advice to LGAs on implementation of monitoring and evaluation of OM of water supply in the respective areas in line with the decentralisation policy.

Output 5: The solar-powered water supply facilities constructed under the Project are operated and maintained in sustainable manner.

Sustainable use of the constructed water supply facilities will be realised by the community-based OM centring on VWC in collaboration of the public sector as the supervisor and the private sector as the service provider for the maintenance of the solar pumping system. Periodic payments of the subscription fee by the communities, technical support in appropriate time by the private OM companies and close contact within the stakeholders in case of breakdown of the facilities will contribute to reduction of the suspension of the operation and provision of stable water supply service.

3. Means of Verification of Achievement of the Output

Output 1: The community-based OM system of the water supply facilities is established in the target sites.

Achievement of this output will be verified with the documents listed below which will be prepared by VWCs for OM of the water facilities:

1) Regulation and action plan of the VWC, and rules of water use in each target sites
2) Declaration of commitment to maintenance of the solar-powered water supply facilities to be

signed by the target communities witnessed by DWR and Area Councils

3) Maintenance service contract to be made between the target communities and the maintenance service companies.

Monitoring reports by DWR and the Area Councils will also be referred for confirmation of the achievement of capacity building of VWCs.

Output 2: Foundation of the mutual confidence among the community, maintenance service provider and government is built in OM of the water supply facilities by understanding and recognising their roles and responsibilities each other.

The following points will be monitored with regard to this output;

i) The target communities, maintenance service companies, and the DWR/ Area Councils are fully aware of roles and responsibilities of each party in OM.

ii) Constructive relationship is built among these three parties.

The level of achievement of this output will be confirmed by using questionnaires for the stakeholders at the end of the Soft Component activities.

Output 3: The community members firmly understand and ways of safe and efficient use of water from the constructed water supply facilities.

Monitoring will be done whether community members understand how to properly use water and put them into practice. The level of understanding of the community members will be confirmed by the progress reports of the Software Component after implementation of the sensitisation activities. Results of monitoring and evaluation by DWR and the Area Councils will also be utilised to obtain information on behaviour change of the community members with regard to water use.

Output 4: Monitoring and supervision system of maintenance activities conducted by the private service providers are reinforced at the public sector, i. e. DWR and the local authorities.

It will be confirmed whether the Area Councils effectively implement monitoring and evaluation (M&E) of OM activities according to M&E plans which are to be formulated by the Councils as a part of the Software Component activities. Means of verification of this indicator are M&E reports prepared by DWR and the Area Councils and questionnaires for the maintenance service provider and VWCs.

Output 5: Solar pumping water supply system to be constructed under the Project will be operated and maintained in sustainable manner

It is necessary to continuously monitor the OM conditions of the constructed facilities. After

the facilities are handed over, the maintenance service provider will conduct the regular maintenance and submit OM reports to DWR/ Area Councils and the communities. Information and data in these reports will be referred to verify the achievement of this output.

5. Plan of Activities (Input of the Project)

In this Project, the construction works and handing over of the facilities will be completed in 24 months after conclusion of the Grant Agreement. The plan of the Soft Component activities are designed in accordance with this schedule while a part of monitoring will be implemented after the facilities are handed over. The planned activities will be implemented into four stages of "A. Pre-Construction", "B. Construction-Stage" "C. Handing-over Stage", and "D. Certain period after the launch of the construction works in all the target sites".

A. Pre-construction Stage;

- To mobilise stakeholders of the Project in the government (DWR and Area Councils) and village levels.
- To train facilitators, i.e. TAC-MDFT members and community health workers, who will be responsible for implementation of the planned activities at village level.
- To conduct training of VWCs, the focal point at the village level, by the TAC-MDFT members to strengthen their capacity to be required for coordination between the community and external agencies, leadership to take the initiative in participating in the process of construction works and preparation of OM system, and financial management as well as action planning.
- To implement activities for three groups of stakeholders (community, private company, and public sector) to be involved in OM system to recognise their roles and to build mutual understanding and confidence after the selection of the private maintenance service provider.

B. Construction Stage

- The VWCs to facilitate community participation in implementation of the Project and community health workers to conduct participatory hygiene promotion periodically with utilising knowledge and skills obtained through the trainings in the pre-construction stage.
- TAC-MDFT members to monitor these activities to be implemented by the VWCs and community health workers and to facilitate them to cope with problems observed and improvement of the activities.

C. Handing-over Stage

- To support the VWCs for proper understanding on terms and conditions of the maintenance service contract and promote required arrangement to enter into the contract.
- To evaluate achievement and impacts of the Software Component programme with the community members at the end of the programme.
- To review the action plan formulated in the pre-construction stage by each target community