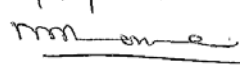


資料-6 参考資料

資料 6-1 環境社会影響に係るスクリーニング (NWSDB 作成)

Appendix 4. Screening Format

Name of Proposed Project: Rehabilitation of Kilinochchi Water Supply Scheme
Project Executing Organization, Project Proponent or Investment Company: National Water Supply and Drainage Board
Name, Address, Organization, and Contact Point of a Responsible Officer:

Name: Mr KLL Premanath, General Manager
Address: Galle Road, Ratmalana
Organization: National Water Supply and Drainage Board
Tel: 011 2635990
Fax: 011 2636449
E-Mail: gm@waterboard.lk
Date: 30/03/2011
Signature: 

Check Items

Please write "to be advised (TBA)" when the details of a project are yet to be determined.

Question 1: Address of project site

Wilson Road, Kilinochchi

Question 2: Scale and contents of the project (approximate area, facilities area, production, electricity generated, etc.)

2-1. Project profile (scale and contents)

Water Treatment Plant Capacity – 3000m³/day

Approx. Project Area – 30 sq. km

Distribution Length – approx. 30km pipe length

2-2. how was the necessity of the project confirmed?

(The groundwater was not suitable for drinking purposes and wells dry out during drought season. There was a pipe born water supply scheme existed and thus was damaged during Conflicts)

Is the project consistent with the higher program/policy?

YES: Please describe the higher program/policy. ✓

It is planned to provide 60% of the population safe access to drinking water in year 2020 and 100% population in 2030

NO

2-3. Did the proponent consider alternatives before this request?

YES: Please describe outline of the alternatives

()
NO✓

2-4. Did the proponent implement meetings with the related stakeholders before this request?

Implemented Not implemented

If implemented, please mark the following stakeholders.

Administrative body

Local residents

NGO

Others (farmers)

Question 3:

Is the project a new one or an ongoing one? In the case of an ongoing project, have you received strong complaints or other comments from local residents?

New Ongoing (with complaints) Ongoing (without complaints)

Other ✓

It is a Rehabilitation Project; earlier one was demolished during the Conflict.

Question 4:

Is an Environmental Impact Assessment (EIA), including an Initial Environmental Examination (IEE) Is, required for the project according to a law or guidelines of a host country? If yes, is EIA implemented or planned? If necessary, please fill in the reason why EIA is required.

Necessity Implemented Ongoing/planning

(Reason why EIA is required:)

Not necessary ✓

Other (please explain)

Question 5:

In the case that steps were taken for an EIA, was the EIA approved by the relevant laws of the host country? If yes, please note the date of approval and the competent authority.

<input type="checkbox"/> Approved without a supplementary condition	<input type="checkbox"/> Approved with a supplementary condition	<input type="checkbox"/> Under appraisal
---	--	--

(Date of approval: Competent authority:)

Under implementation

Appraisal process not yet started

Other ()

Question 6:

If the project requires a certificate regarding the environment and society other than an EIA,

please indicate the title of said certificate. Was it approved?

Already certified

Title of the certificate: ()

Requires a certificate but not yet approved

Not required ✓

Other

Question 7:

Are any of the following areas present either inside or surrounding the project site?

Yes No ✓

If yes, please mark the corresponding items.

National parks, protection areas designated by the government (coastline, wetlands, reserved area for ethnic or indigenous people, cultural heritage)

Primeval forests, tropical natural forests

Ecologically important habitats (coral reefs, mangrove wetlands, tidal flats, etc.)

Habitats of endangered species for which protection is required under local laws and/or international treaties

Areas that run the risk of a large scale increase in soil salinity or soil erosion

Remarkable desertification areas

Areas with special values from an archaeological, historical, and/or cultural points of view

Habitats of minorities, indigenous people, or nomadic people with a traditional lifestyle, or areas with special social value

Question 8:

Does the project include any of the following items?

Yes No ✓

If yes, please mark the appropriate items.

Involuntary resettlement (scale: households persons)

Groundwater pumping (scale: m³/year)

Land reclamation, land development, and/or land-clearing (scale: hectares)

Logging (scale: hectares)

Question 9:

Please mark related adverse environmental and social impacts, and describe their outlines.

No Adverse Impacts

- 1.5 Necessary approvals from the Karachchi Pradeshiya Sabha, Department of Irrigation and other relevant agencies should be obtained prior to the implementation of the project.
- 1.6 The NWS & DB is responsible for the equity in distribution of drinking water throughout the proposed project area by adopting appropriate mechanisms, in order to ensure the fairness in distribution and to mitigate wastage of drinking water.
- 1.7 Any waste water arising from cleaning and washing shall not be released freely into the environment and such waste water shall be discharged in to a properly constructed soakage pit.

2. Noise & Vibration

- 2.1 Noise levels at the boundary of the site during the construction stage should be maintained at or below 75 dB (A) during day time (between 06.00 hrs to 21.00 hrs) and at or below 50 dB (A) during night time (between 21.00 hrs to 06.00 hrs).
- 2.2 Transport of loading and unloading of material shall be carried out in such a way to minimize the nuisance to the public and adjoining school by way of dust or noise.

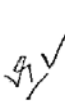
3. Disposal of Solid Waste

- 3.1 Solid waste associated with the construction and the work force shall be collected regularly and disposed in consultation with the local Authority – Karachchi Pradeshiya Sabha.

Assistant Director,
Central Environmental Authority,
Northern Provincial Office,
Jaffna.

Assistant Director
Central Environmental Authority
Northern Provincial Office
Jaffna

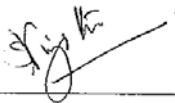
Signd. Deputy Director General -
Environmental Pollution Control Division,
Central Environmental Authority,
Battaramulla.

Copy to:  Regional Manager (J),
National Water Supply & Drainage Board,
Kandy Road,
Jaffna

**The Preparatory Survey on Rehabilitation of Kilinochchi Water Supply Scheme in
Democratic Socialist Republic of Sri Lanka**

Subject: Confirmation of Contents of CEA approval letter (NO/KN/08/ER/41/11) dated June 16, 2011.

1. Meeting Date: June 23, 2011, 9:00-10:00
2. Meeting Place: CEA office, Jaffna
3. Attendants: CEA, Northern Provincial office, Jaffna - Assistant Director,
Mrs. Vijitha Sathiyakumar
JICA Study Team, Kenji Takayanagi
NWSDB: R. Siveenthan, Engineer - Jaffna.
4. Meeting Result
 - (1) CEA approval letter (NO/KN/08/ER/41/11) dated June 16, 2011 is Environmental Clearance Letter by CEA.
 - (2) By this letter, EIA and IEE report are not required and are not necessary for the rehabilitation project of Kilinochchi water supply scheme in democratic socialist republic of Sri Lanka.
 - (3) In the implementation of the Project, constraint conditions described in the CEA Approval Letter NO/KN/08/ER/41/11) dated June 16, 2011 should keep by relating organizations to the Project.



VIJITHA SATHIYAKUMAR
CEA, Jaffna ASSISTANT DIRECTOR

V. Sathiyakumar
Assistant Director
Central Environmental Authority
Northern Provincial Office
Jaffna

AGREEMENT
BETWEEN THE
PROVINCIAL IRRIGATION DEPARTMENT
AND THE
NATIONAL WATER SUPPLY & DRAINAGE
BOARD
FOR
WATER SHARING
FROM
IRANAMADU RESERVOIR (TANK)
FOR THE
JAFFNA PENINSULA WATER SUPPLY SCHEME

**AGREEMENT BETWEEN THE
PROVINCIAL IRRIGATION DEPARTMENT (NEPC) AND THE NATIONAL WATER
SUPPLY & DRAINAGE BOARD FOR SHARING WATER
FOR THE JAFFNA PENINSULA WATER SUPPLY SCHEME**

This agreement is made and entered into by and between the Secretary to the Ministry of Agriculture, Irrigation & Lands, NEPC, Trincomalee for and on behalf of the Director of Irrigation, NEPC, (hereinafter called and referred as the Party of the first part which term of expression as herein used shall as and where the context so requires or admits of construction mean and include the said Secretary to the Ministry of Agriculture, Irrigation & Lands as aforesaid and his successors in the said office for the time being and the officers who for the time being are acting in the office of or are performing the functions now exercised by the Secretary to the Ministry of Agriculture, Irrigation & Lands acting herein for and on behalf of the North East Provincial Council Democratic Socialist Republic of Sri Lanka) and the National Water Supply & Drainage Board, a body corporate established under law No. 2 of 1974 and having its principal place of business at Galle road, Ratmalana (hereinafter called and referred to as the Party of the second part) of the other part.

WHEREAS

- (A) Implementation of the Jaffna Peninsula Water Supply Scheme (under Asian Development Bank Funding) is to be executed by the National Water Supply & Drainage Board, the Party of the second part.
- (B) It has become necessary to form an agreement for abstraction of water from the Iranamadu reservoir (tank) for Jaffna Water Supply Scheme
- (C) Such abstraction shall not have adverse affects on existing water users.
- (D) It is intended to construct a permanent intake structure for the abstraction of water from the Iranamadu reservoir with the approval of the Director of the Irrigation Department, the Party of the first part.
- (E) Such construction or operation of such infrastructure shall not have any adverse affects on the operation and safety of the existing system.

Now it is hereby mutually agreed by and between the parties as follows:

1. The Party of the first part agrees to the Party of the second part abstracting up to 1250 acre feet/month and that the Party of the first part undertakes to facilitate such process and to not take any steps to hinder such abstraction other than as provided in this agreement.
2. The Party of the first part agrees to the construction of permanent intake facilities by the Party of the second part subject to the approval of the designs and construction by the Party of the first part.
3. In order to accommodate the additional water requirement for provision of water for the Jaffna Peninsula Water Supply the Party of the second part shall provide funds for the works required to rehabilitate and extend the embankments, spillways and stilling basin and to rehabilitate, replace or

51395 m³/d.

add radial gates to permit an increase in the full storage level of the dam to 103 feet (31.39 metres) AMSL and to increase the capacity to pass the design flood as determined and agreed between the technical advisors to the Parties of the first and second parts. The works shall be substantially completed prior to the abstraction of water for the Jaffna Peninsula Water Supply.

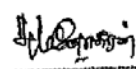
4. Both Parties undertake to seek Government support through funding by the World Bank, the Japan Bank for International Cooperation and the Asian Development Bank for the rehabilitation of the downstream works of the Iranamadu system including distribution system improvements, crop diversification and institutional development to match the water savings criteria assumed in concluding that 1,250 acre feet per month of water is available for potable water supply. These assumptions were that 20,900 acres of paddy is supplied with irrigation water in Maha and 11,600 acres of other food crops is supplied with irrigation water in Yala. The works referred to in Paragraph 3 shall be substantially completed prior to the abstraction of water for the Jaffna Peninsula Water Supply
5. The Party of the second part undertakes to contribute towards the cost of operation and maintenance of the head works on a pro rata basis of the quantity of water withdrawn by each Party through their respective off-takes. The head works comprise the dam embankment, spillways, radial gates, stilling basin and intake structures.
6. If the Party of the second part intends to modify, rehabilitate or refurbish the intake facilities of the Jaffna Peninsula Water Supply System at a later date with the intention of maximizing O & M efficiency and to minimize operation difficulties it shall be carried out with the prior approval of the Party of the first part.
7. The Party of the second part shall arrange for flow measuring devices at the intake and the Party of the first part shall be allowed to observe the readings jointly with the Party of the second part or individually by means of an agreed mechanism. The Party of the first part shall arrange for construction of new measuring devices to measure the flow in the left and right bank main canals with funding from the Party of the second part. Both Parties shall maintain daily records of the flow measurement of their usage, which shall be reported monthly or as required by the other Party.
8. The Party of the first part will pursue, through the water management committee¹, the right to control rates of or stop abstraction of water by the second Party in the event that the Party of the first part finds that the abstraction is having an adverse effect on cultivation in the command area of the reservoir. During the periods of exceptional water scarcity, priority of water allocation between the two parties shall be decided by the water management committee, comprising officers from the first and second parties, farmer representatives and other water user stakeholders. Priority shall be given to standing crops in Maha season then to domestic use for downstream settlers and cattle but in no instance will the percentile reduction in water provided to the Party of the second part be more than the percentile reduction in water provided for irrigation.
9. It shall be obligatory on the Party of the second part to allow the Party of the first part to inspect and observe any structure or part of it in the water supply infrastructure at any time.

¹ The Water Management Committee shall comprise the following members or their representatives: Government Agents from Kilinochchi and Jaffna; Deputy Provincial Director (NE) of the Irrigation Department; Regional Manager (N) of the NWS&DB; Planning & Development Secretariat, Kilinochchi; Jaffna Municipal Council; five representatives from farmers' organisations; and three representatives of Jaffna District water users.

10. No construction of other structures for the use of the Party of the second part is permitted without the prior approval of the Party of the first part.
11. Staff of the Party of the second part attached to the intake facilities shall be responsible for and shall have free access for the operation and maintenance of the intake facilities and shall be allowed to be stationed at the intake facilities.
12. A representative of the Party of the second part shall be a member of the project management committee of the Iranamadu scheme established under the Irrigation Ordinance and any amendments thereto.
13. Any conflicts arising in implementation of this agreement shall be referred to a joint panel consisting of the Governor of the North East Province and the Secretary of the Ministry under which the NWSDB is placed for settlement in consultation with the Chief Secretary (N&E).

IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED THIS AGREEMENT at the place (s) and date (s) hereinafter mentioned.

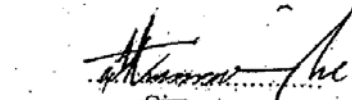
PARTY OF THE FIRST PART

Signed by: Sudpaiah Manoharan 
 Secretary to the Ministry of Agriculture, Irrigation & Lands, North East Provincial Council, Trincomalee
 Ministry of Agriculture, Livestock Development, Lands, Irrigation & Fisheries, Northern Province
 Signature: Eng. S. Sarvaloganathan
 Deputy Director of Irrigation, Kilinochchi Range
 At Trincomalee on 15 Day of July of two thousand and six in the presence of the following Witnesses:
 WITNESS Usoor Panay WITNESS N. Vethanayahan
 Signature: Usoor Panay Signature: N. Vethanayahan
 Address: Eng. A. C. Dinotheraj Address: N. Vethanayahan
 Deputy Director of Irrigation Govt. Agent /
 Occupation: KILINOCHCHI RANGE Dist. Secretary
 Signed by: Kilinochchi District Occupation: Kilinochchi District
 Signed by: _____

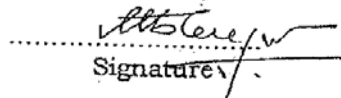
PARTY OF THE SECOND PART

The common seal of the National Water supply and Drainage Board is affixed in the presence of

Signed by S. C. Amarasinghe
Chairman of the
National Water Supply and Drainage Board



Signature

Signed by M. S. Nageer
Working Director of the
National Water supply and Drainage Board


Signature

Rafnabana on 14th Day of Sept.... of two thousand and seven in the presence of the following witnesses.

WITNESS

Signature: 

WITNESS

Signature: 

Address: NWSDB, Rafnabana

Address: NWSDB

Occupation: General Manager

Occupation: Chief Eng (ADB)

Signed by: K. L. K. Premarath

Signed by: C. S. Soudoudene (Mrs)

தே.நீ.வ.உ.ச.வ.ப.ய.ய.ல் நடை ஒன்றுக்கு 1-2 மணித்தியாலம் மத்தியம்தான் பாழ் குடாரடை மக்களுக்கு
 ின் வழங்கப்படுகின்றது எனவும் உத்தேசிக்கப்பட்ட 2022ஆம் திட்டத்தில் உள்ள மக்களின்
 நீர்த்தேவை 88500m³/day ஆக இருந்தும் இத்திட்டத்தில் மூலம் 27000 m³/day மட்டும் எடுப்பதாகவும்
 மீதியை நிலைநடி செய்ய வேறொரு மாற்றுத்திட்டத்திற்கு அதாவது மாழ்ப்பாண நீர்நீர் கலந்தநீர்ப்புத்
 திட்டம் மற்றும் வேறு திட்டங்களிற்கு செல்ல வேண்டி இருப்பதாகவும் கூறினார். செய்துகொள்ளப்பட்ட
 புதித்துணர்வு உடன்படிக்கையில் குறிப்பிட்டுள்ளவற்றை விளக்கமாகக் கூறியதடன் இத்திட்டத்தில்
 உள்ளடங்கிய கலாநாகரத் திட்டங்களையும் கூறினார். இத்திட்டத்தை அமுல்படுத்துவதற்கு சமூகநீர்
 வலிப்பு நிப்பாசனத் திட்டங்களையும் விவசாயிகள் மற்றும் இங்குள்ள மக்களின் முழு ஒத்துழைப்பும்
 தேவை எனக் கூறியதடன் தே.நீ.வ.உ.ச.வ.ப.ய.ய.ல் ஏற்கனவே கூறியதற்க்கமைய பரிந்துரை
 உடன்படிக்கையின் கீழ் பொறிப்பெட்பும் புரிந்துணர்வு உடன்படிக்கையின் ஒருபக்கக் கூற்றும்
 விவசாயிகளுக்கு வழங்குவதற்கு 6000 பிரதிகள் தயாராக இருப்பதாகக் கூறினார்.

விவசாயிகளின் சம்பிரதானத்தின் தலைவரின்

இவர் திட்டப்பணியாளரின் விளக்க உரையின் போது சில சில குறிப்புகளை முன்வைத்தார். அவை
 வருமாறு :

- * உடன்படிக்கையில் குறிப்பிட்டுள்ளது போன்று ஏக்காரணம் கொண்டும் 1250 ஏக்கரை நீர்
 விட சேடுதவாக எடுக்க கூடாது.
- * புதிந்துணர்வு ஒப்பந்தத்தில் குறிப்பிடாத பிரகாரம் கிளிநொச்சி மாவட்ட விவசாய நீர்
 தேவைக்கு இடையூறு ஏக்காலத்திலும் நிகழ அனுமதிக்கமாட்டோம்.
- * நீப்பாசனத் தொடர்பாக நடைநிறுத்த மூன்று மாதத்திற்கு ஒருமுறைபாணது விவசாய
 சம்பிரதானத்துடனும் நீப்பாசனத் திட்டங்களத்தாலும் கலந்துறையாடல் மெற்களள்ள
 அளவையும் ஒன்று உருவாக்கப்படல் வேண்டும். அவ் அளவையில் நீர் வழங்கும் காலகாலின்
 பிரசன்னம் கூடிய விசித்தத்தில் அமைய வேண்டும் எனவும் வலியுறுத்தினார்.
- * மழைநீரால் முடிந்த பின்னர் ஒவ்வொரு ஆண்டும் நீப்பாசனத் தொடர்பான சம்பிர
 கிளிநொச்சி அரசாங்க அதிபா தலைமையில் நடைபெற வேண்டும்.
- * MOU தொடர்பாக அனைத்து விவசாயிகளுக்கும் சிறப்பான முறையில் நீப்பாசனத்
 திட்டங்களத்தின் ஒவ்வொரு கமக்கார அளவையும் சிறப்பாக மேற்கொள்ள வேண்டும்

பிரதி நீப்பாசனத் பணிப்பாளர்

பிரதி நீப்பாசனத் பணிப்பாளர் பொறுப்பாளர் சதாகரன் அவர்கள் குறிப்பிடும்போது இத்திட்டத்திற்கு
 தமது திட்டங்களத்தினால் மேற்கொள்ளப்பட்டவுள்ள குடியுரிமைப்பு வேலைகளுக்கான
 வேலைத்திட்டங்களை ஆரம்பிப்பதாகவும், இத்திட்டத்திற்கு தமது திட்டங்களத்தாலான உட்கட்டுகளைக்
 செய்வதாகவும் இத்திட்டத்தினால் மிகவும் வரட்சியாக உள்ள இம்மாவட்ட மக்களினுடைய
 நீர்த்தேவையை புதித் செய்ய ஏதேனும் திட்டம் இருந்தால் அதையும் இத்திட்டத்தின்
 உள்ளக்கூடியும் தெரிவித்தார்.

கலாநாகர பிரதேச செயலாளர்

நாது பிரதேசம் இத்திட்டத்தினால் சேர்த்துக்கொள்ளப்படாமை மிகவும் கவலைக்குரிய விடயம் என்றும்,
 எமது பிரதேசத்தில் குடிநீர் மற்றும் விவசாய தேவைகளுக்காக நீர் தேவைப்படுவதாகவும், அவற்றை
 புதித் செய்வதற்கு எமது பிரதேசத்தினையும் இத்திட்டத்தினால் சேர்த்துக்கொள்ள நடவடிக்கை
 மேற்கொள்ள வேண்டும் எனவும் தெரிவித்தார்.

இறுதியாக அரசாங்க அலுவல் அணிகள், கிளிநொச்சி குடிநீர் வழங்கல் திட்டத்தினால் விவசாய
 ஆரம்பிக்க வேண்டும் என தே.நீ.வ.உ.ச.வ.ப.ய.ய.ல் வேண்டுகோள் விடுத்ததடன், சமூகநீர்வலிப்பு
 கலந்துகொண்டு ஒத்துழைப்பினையும், ஆலோசனைப்பினையும் வழங்கிய அனைவருக்கும் நன்றியினையும்
 தெரிவித்துக்கொண்டார்.

இக்கூட்டம் 11.30 மீள முடிவடைந்தது.

.....
 திருமதி. ருபவதி தேதீஸ்வரன்,
 அரசாங்க அதிபர், கிளிநொச்சி.

திருமதி. ரு. தேதீஸ்வரன்
 அரசாங்க அதிபர்/
 மாவட்ட செயலாளர்
 கிளிநொச்சி மாவட்டம்

Translation of the Minutes of the Discussion that GA, Kilinochchi and the relevant officials had with representatives of the Farmers Federation about supply of water to Jaffna from Iranamadu Tank.

Venue : Kilinochchi District Secretariat, Auditorium
Time : 10.30 am
Date : 12th October 2010

The Discussion with the farmers began at 10.30 a.m at the Kilinochchi District Secretariat Auditorium with the Kilinochchi Government Agent Mrs. Rubawathy Ketheswaran in the chair. Project Director, The National Water Supply & Drainage Board (NWS&DB), the Engineers of the Provincial Irrigation Department, the Deputy Director of the Irrigation Department, the Divisional Secretaries of Kilinochchi and the Representatives of the Farmers Federation (attendants register is attached herewith). In the opening address of the Government Agent she welcomed the officials who attended at the meeting She informed that the people of this district have been stressing the need for the rehabilitation of the tank in the past.

The Project Director, NWSDB in his address, welcomed all these who took part in the discussion and informed them that this project was proposed in 2006 and the time has come for its implementation. This project involves in the rehabilitation of the Iranamadu Tank, the supply of water for the Farmers of Kilinochchi and the supply of drinking water for the people of Jaffna. The project will implement the rehabilitation of the Iranamadu tank through the Provincial Irrigation Department with the funds of the Asian Development Bank. NWS&DB will undertake the water supply and Sanitation Project for the people of Jaffna and Kilinochchi. He explained the aims of the NWS&DB and its targets with maps. After that he explained the present condition of the Iranamadu Tank;

- It could hold 106,500 acre feet of water
- The tank can store water up to a depth of 28.30 ft instead of the 31 feet full supply depth, because the tank bund and the radial gates are damaged. The surplus water is allowed to drain off.
- The main supply channels are damaged to the water goes to waste.
- The cultivation in highlands has been interrupted because the water supply has not been restored.

He said that the highland cultivation and the "Maha Season" cultivation and the people living along the channel in the lower reaches could get water for their use and for the cattle, if the tank bund is raised by 2 feet.

The Project Director in his speech said that out of 50,000 m³/day, 27,000 m³/day could be sent to Jaffna for the supply of drinking water, 2000m³/day for Poonagary, Palai and other places. 4000 m³/day could be provided for Killinochchi water supply could be used. Further 8000 m³/day could be supplied for the second stage of the Kilinochchi town water supply and Iranamadu Tank will not be used for any other

purpose. As mentioned in the MOU the water will be taken with the consent of the Farmers and that the Farmers of Kilinochchi would continue to get water as they get now and they could also get additional water for highland cultivation. He further said that the NWS&DB supplies water only for 1-2 hours in the Jaffna Peninsula and that in the proposed demand in 2028, water would be 88,500m³/day. To obtain the balance needs of water we have to depend on various other projects. He spoke about the sanitation programs also. Further he thanked the Government Agent, the Irrigation Department, the Farmers and the People for their cooperation in implementing this project. As informed by the NWSDB earlier, the 6000 copies of the Tamil translation of the MOU and the one page summary notice giving the main points are ready to be distributed among the Farmers (6000 copies are ready).

The President of the Farmers Federation raised some points during the explanation of the Project Director, they are as follows;

- As mentioned in the MOU under no-circumstances will more water should be taken other than the agreed 1250 acre feet/month.
- We would not permit any hindrance to the Kilinochchi Farmers at any time as mentioned in the MOU.
- A committee should be setup to discuss with the Farmer's Federation and the Irrigation Department at least once in three months regarding water distribution. In that committee Farmer representation should be in the majority.
- A meeting regarding water distribution should be held presided by the Kilinochchi Government Agent at the end of the rainy season every year.
- The Irrigation Department should meet each Farmer organization and explain the MOU.

Deputy Director of Irrigation Eng. Suthaharan said that they will start the program for rehabilitation of the Iranamadu Tank and that they will provide all possible help for the project. He further said that if there is any other project that is useful to fulfill the need for water in this very dry district that should also be included in this project.

Divisional Secretary Kandavalai said that, he was very sad that his division was not included in this project and that his division needs water for agriculture as well as drinking purposes. He requested that his division should be included in the project to full fill the needs of the division

Finally the Government Agent requested the NWS&DB to start the water supply project for Kilinochchi quickly and thanked all officers for their participation cooperation and suggestions.

The meeting ended by 11.30a.m.

資料 6-5 野生生物局確認書

Wild Life Ranger,
Department of Wild Life,
Kachcheri,
Vavuniya.
2011.05.02.

Regional Manager,
National Water Supply and
Drainage Board,
Jaffna.



Rehabilitation of Kilinochchi
Water Supply Scheme.


Your Reference No. RM/JAF/KILI/2011.

We wish to refer to your letter of 26.04.2011
with regard to the above subject.

In this connection, we wish to inform that the
mentioned area is not falls under our Wild Life.

Therefore, we have no objection or hesitation to
carry out said project.

Thanking you,


.....
Wild Life Ranger.


සී.ඒ.බී. ජේෂ්වරත්න
විනිසේවක ජනරාල්
විනිසේවක කාර්යාලය
වවුනියා


Dumping Site for Surplus Excavation Soil

June 10, 2011

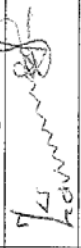
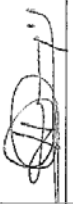

- ① Location of Dumping Site
- ② Address / Show the location on the map.
- ③ How much is the dumping fee /m³? 4,
- ④ Who is the owner (private/public)?
- ⑤ Regarding dumping, what office supervise the dumping site?
- ⑥ Area of Dumping site, (___ m²)

- ① UMAYAL DURAM
- ② UMAYAL DURAM
KILINOCHCHI
- ③ Per m³ 496/-
- ④ KARACHHI PRADSHYASABA State Land
- ⑤ " " "
- ⑥ 82500 m² (20 Acres)


Technical Officer
Karachi Pradeshiya Sabha
Kilinochchi


10/06/11
K. Thavasothy
Secretary
Karachi Pradeshiya Sabha
Kilinochchi.

Karachchi, Redegia, Sabr JICA Preparatory Survey on Rehabilitation
 of Kilinochchi Water Supply Scheme in Democratic
 Socialist Republic of Sri Lanka
 Friday June 10, 2011

Name	Designation	Organization	TEL	Signature
Mr. K. Thanasothy	Secretary	Karachchi: P.S	021 228 5761	
MR. C. C. NASEL	TECHNICAL OFFICER	" "	0775285628	
Kenji TAKAYAMA	Environmental and social consideration Specialist	JICA Study Team	0777617794	

資料 6-7 社会条件調査

本案件の実施後は、事業効果の発現を図るため、給水区域内の世帯及び事業所の給水接続を促進する必要がある。本事業設計に必要な現地情報を入手し、事業評価に資するベースライン情報を収集するため、プロジェクト・サイトにおける以下内容の聞き取り調査を現地再委託で実施した。

- 世帯と事業所の水利用現況（給水手段・方法、負担費用、水質）
- 現況の水利用に伴う費用
- 給水システム改善の要望と水道料金体系への要望
- 世帯と事業所の污水排水の現況
- 衛生状況と罹患時の費用負担の状況
- 世帯収入及び支出状況

(1) 調査方法

本事業の計画対象区域は、カラチッチ郡の 12 の行政村とカンダワライ郡の 2 つの行政村がある。各行政村の人口密度と行政村の中で給水区域に含まれる割合を勘案して、割り当てた行政村ごとの世帯数を下記に示す。

表-A6-3-1 聞き取り調査の対象世帯数

行政郡	行政村	世帯数	人口密度	給水区域 占有率	割当率(%)	検体数 (世帯数)
カラチッチ	Kanagambikikulam	559	高	高	12%	66
"	Thondamannagar	274	高	高	12%	33
"	Ratnapuram	390	高	低	8%	30
"	Kanagapuram	415	低	高	8%	32
"	Thirunagar South	373	低	高	8%	31
"	Thirunagar North	472	低	高	8%	36
"	Killinochchi Town	385	高	高	12%	45
"	Udayanagar East	637	高	低	8%	50
"	Muruthanagar	441	低	低	4%	17
"	Anandapuram	661	高	低	8%	52
"	Kaneshapuram	261	低	低	4%	10
"	Vivekandanagar	507	低	低	4%	20
カンダワライ	Kumaranpuram	380	低	低	4%	18
"	Paranthan Town	648	高	高	12%	72
合計		6,403				512

公共施設・事業所は、下記の 15 件を調査対象として選定した。

表-A6-3-2 聞き取り調査対象の公共施設・事業所

	分類	職員数	一日平均訪問者数
1	NGO -地雷撤去支援	07	80
2	NGO	30	50
3	携帯電話サービス業	06	75
4	一般店舗	04	250
5	服飾店	05	50

	分類	職員数	一日平均訪問者数
6	銀行	11	60
7	病院	200	600
8	公共施設（教育事務）	12	70
9	公共施設（技術専門校）	115	75
10	公共施設（行政事務）	11	50
11	ホテル	04	120
12	ホテル	05	60
13	ホテル	04	50
14	ホテル	04	60
15	ホテル	09	100

(2) 家庭調査結果概要

<世帯情報>

世帯の情報として次のような結果を得た。

表-A6-3-3 家族構成員の職業

職業	人数	比率 (%)
公務員	68	7.5
民間／NGO	27	3.0
技能職（大工、レンガ工、仕立職員、理髪師等）	118	13.0
農業従事者	64	7.0
畜産業	13	1.4
労働者	12	1.3
自営業（タバコ売り、縫製業、人力車夫等）	32	3.5
自営業（一般店舗、服飾店等）	18	2.0
小規模工業（バケツ製造、皮革加工等）	4	0.4
失業者	418	45.9
その他	137	15.0
合計	911	100

表-A6-3-4 平均一月当たり世帯収入

収入	世帯数	比率 (%)
Rs 5,000 以下	132	25.8
Rs. 5,000～ Rs. 10,000	143	27.9
Rs. 10,000 ～ Rs. 20,000	155	30.3
Rs. 20,000 以上	62	12.1
未回答	20	3.9
合計	512	100

表-A6-3-5 現状の取水手段

水源	世帯数	比率 (%)
給水管接続	2	0.4
共同水栓（管接続）	0	0
揚水井戸（私有）	39	7.6
打ち抜き井戸（私有）	180	35.2

水源	世帯数	比率 (%)
打ち抜き井戸 (隣人所有)	96	18.7
打ち抜き井戸 (共同)	32	6.2
掘り抜き井戸 (私有)	83	16.2
掘り抜き井戸 (隣人所有)	59	11.5
掘り抜き井戸 (共同)	9	1.8
手動揚水井戸	6	1.2
表流水/ため池/灌漑水路	0	0
雨水	0	0
給水車	1	0.2
その他	5	1.0
合計	512	100

表-A6-3-6 現状の水質

水質に対する意見	雨期	乾期
色が悪い	51	48
悪臭がする	39	41
味が悪い	47	53
水の硬度が高い	146	137
藻が多い	56	69
沈殿物が混入している	45	59
煮沸すると白色の沈殿物が残る	163	159
その他	5	10

表-A6-3-7 取水のための移動時間

移動手段	距離 (m)				計
	0-100	100-250	250-500	>500	
徒歩	166	24	12	5	207
自転車	4	2	0	1	7
合計	170	26	12	6	214

表-A6-3-8 煮沸後の水を飲む家族

分類	世帯数	比率 (%)
全員	250	48.8
子供のみ	29	5.7
老人のみ	6	1.2
子供及び老人のみ	7	1.4
誰もいない	220	42.9

<健康に関して>

飲料水と健康に関して、以下の状況が確認された。

- 過去一年間に 91 件の飲料水が起因した健康被害が生じている。
- 一件当たり 1,068 Rs の薬代、246 Rs の交通費、その他の費用 22 Rs が生じている。
- 一月当たり平均収入が 12,800 Rs であることから、治療に要する費用はかなりの負担になっている。

- 151 件の歯の障害に加えて 11 件の腎臓障害があった。

<水道への要望>

水道への接続について、住民の強い要望が確認された。

表-A6-3-9 要望する給水手段

要望する給水手段	世帯数	比率 (%)
給水管接続 (各戸接続)	450	87.8
共同水栓 (管接続)	23	4.5
屋外水栓 (管接続)	1	0.2
私有浅井戸	16	3.1
共同浅井戸	1	0.2
深井戸	6	1.2
人力揚水ポンプ	3	0.6
雨水貯留システム	1	0.2
その他	3	0.6
無回答	8	1.6
Total	512	100

<水道代金支払い意志>

水道代金への支払い意志調査の結果は、次のとおりである。

表-A6-3-10 水道料金支払い意志額

範囲 (Rs /月)	世帯数	比率 (%)
<100	111	21.7
100-250	271	52.9
250-500	62	12.1
>500	29	5.7
無回答	39	7.6
合計	512	100

(3) 公共施設・事業書調査結果概要

公共施設・事業所の調査結果は、次のとおりである。

表-A6-3-11 公共施設・事業所調査結果

	分類	現況の給水手段	満足しているか?	現状の利用額/月 (Rs)	給水管接続を要望する?	希望支払額 / 月 (Rs)
1	NGO -地雷撤去支援	浅井戸	Yes	なし	yes	750
2	NGO	浅井戸	Yes	なし	yes	500
3	携帯電話サービス業	瓶詰飲料水	yes	4,500	yes	3,000
4	一般店舗	浅井戸/瓶詰飲料水	Yes	9,000	yes	500
5	服飾店	瓶詰飲料水	yes	12,000	yes	500
6	銀行	浅井戸/瓶詰飲料水	yes	9,000	yes	750

	分類	現況の給水手段	満足しているか?	現状の利用額/月 (Rs)	給水管接続を要望する?	希望支払額 / 月 (Rs)
7	病院	浅井戸	yes	電気代として支払っている	yes	No idea
8	公共施設 (教育事務)	浅井戸	Yes 但し8月、9月を除く	なし	yes	750
9	公共施設 (技術専門校)	浅井戸	Yes	なし	yes	750
10	公共施設 (行政事務)	瓶詰飲料水 r	yes	15,000	yes	2,000
11	ホテル	浅井戸	Yes 但し8月、9月を除く	電気代として支払っている	yes	750
12	ホテル	浅井戸	Yes	電気代として支払っている	yes	500
13	ホテル	浅井戸	Yes	なし	yes	325
14	ホテル	深井戸	Yes	1,000	yes	150
15	ホテル	浅井戸	Yes	なし	yes	500

(4) 本事業への反映

社会状況調査の分析結果から、以下の事項が抽出できた。

- 水因性の健康被害が生じており、その治療に要する費用が負担となっている。
- 水道への接続について、住民の強い要望が確認された。90%以上の世帯が給水管からの給水を希望している。
- 水道料金への支払い意志調査は、約半数が一月当たり 100 Rs~250 Rs の範囲の水道料金を考えている。

資料 6-8 ベースマップ作成業務結果

本事業の概略設計を行うために、事業対象区域及びその周辺地域のベースマップを作成した。ベースマップ作成は、以下の手順で地理情報を集め、それをデジタル化して水道施設計画に用いた。

- ① スリランカ全土の地理情報を管理する測量局（Department of Survey of Sri Lanka）が、作成している 50,000 分の 1 の地図（地図番号 08 と 09）のデジタル情報を入手
- ② 上記の地図が内戦が激化する前の 1987 年に作成されたものであることから、現地踏査を行い最新の情報を GPS（Global Positioning System）にてデータ化した。
- ③ 測量局からのデジタル地図を GPS から得られた情報を補完して、最新の地図を作成した。

資料 6-9 測量業務結果

本事業の概略設計を行うための測量を行い、既設の取水施設・浄水施設用地、高架水槽建設予定地（セントラルカレッジ高架水槽及びパラントン高架水槽）の地盤の標高、現況地形、既設及び近隣構造物の配置等を測量してデジタル図面化した。

また、送水管及び配水管路線についても、計画路線の地盤の標高、現況地形、近隣構造物の配置等を把握するための測量を行った。

表-A6-5-1 測量調査数量

項目	内容
平面測量	取水施設・浄水場：約 8,300 m ² セントラルカレッジ高架水槽用地：約 3,700 m ² パラントン高架水槽用地：約 500 m ²
縦断測量	送水管：L=約 14.9 km 配水管：L=約 36.7 km 測点は 20 m 間隔を基本とし、橋梁、カルバート等の地形変換点を測量した。 縮尺 H=1/1000、V=1/200

資料 6-10 地質調査結果

本事業の水道施設の概略設計を行うための地質調査を行い、既設の取水施設・浄水施設用地、高架水槽建設予定地（パランタン高架水槽）の地質状況を調査し、その結果を分析して水道施設を計画・設計した。

表-A6-6-1 地質調査概要

項目	内容
取水施設・浄水施設用地	調査地点：3カ所（取水施設1カ所、浄水場2カ所） <ul style="list-style-type: none">- ボーリング深 = 12.4 m ～16.6 m- 標準貫入試験：35回実施（10回 + 12回 + 13回）- それぞれの地点でN値50以上の粘板岩の支持層確認- 調査深さ以深で硬岩の支持層確認
パランタン高架水槽予定地	調査地点：1カ所 <ul style="list-style-type: none">- ボーリング深 = 10.4 m- 標準貫入試験：9回実施- 6.5 m 以深でN値50以上の粘板岩の支持層確認- 10.4 m 以深で硬岩の支持層確認

資料 6-11 水質調査結果

本事業において復旧する水道施設の概略設計を行うため水質調査を行い、その結果に基づき既存施設の浄水方法を評価するとともに、新たな方式の付加の必要性を検討した。

表-A6-7-1 水質調査概要

調査箇所	内容
キリノッチ浄水場取水地点 (Dry Aru 貯水池)	調査回数：2回 1回目採水日：2011年3月8日 2回目採水日：2011年6月2日 検査項目：色度、臭い、味、pH、電気伝導度、塩素イオン濃度、アルカリ度、アンモニア、硝酸性窒素、亜硝酸性窒素、蒸発残留物、総硬度、鉄、硫酸イオン、リン酸、濁度、フッ素、マグネシウム、銅、マンガン、COD、BOD、農薬（MCPA）、農薬（Glyphosate）、ヒ素、カドミウム、シアン、鉛、亜鉛、水銀、クロム、大腸菌群数、生物(藻類)試験

資料 6-12 主要資機材仕様書

M-1. 取水ポンプ (Intake Pump)

Purpose: To pump raw water from the intake tank to the receiving well.

Quantity: 2sets

Type: Submersible mixed flow pump

Rated: 2.85m³/min x 13.0m, IP68

Motor: 11kW-3phase, 400V, 50Hz, IP68

Material Casing: Cast iron or equivalent
Impeller: Stainless steel casting or equivalent
Main shaft: Stainless steel or equivalent

Standard accessories: Detachable unit: 1 lot
Guide pipes: 1 lot
Lifting chain: 1 lot (7m)
Pressure gauge: 1 lot
Bolts & nuts: 1 lot (SUS304)
Others

M-2. 取水ポンプ吊上機 (Lifting Device for Intake Pump)

Purpose: To lift up the intake pumps for maintenance.

Quantity: 1 set

Type: Manual chain block with I-beam and post

Rated: 0.5ton, H=4m

M-3. 送水ポンプ (Transmission Pump)

Purpose: To pump clear water from the clear water reservoir to the water tower-1.

Quantity: 2 sets

Type: Horizontal centrifugal pump, indoor type

Rated: 2.64m³/min x 41.0m

Motor: 30kW-3phase, 400V, 50Hz, IP44

Material Casing: Cast iron or equivalent
Impeller: Browns or equivalent
Main shaft: Steel (S35C) or equivalent

Standard accessories: Common base: 1 lot
Foot valve: 1 lot
Coupling cover: 1 lot
Pressure gauge: 1 lot
Bolts & nuts: 1 lot (SUS304)
Others

Level: Clear water reservoir: LWL: +17.20
HWL: +19.80
Pump room floor: FL: +20.30

Standard accessories: 1 lot

E-1. 低圧受電盤 (LV Incoming Panel)

Purpose: To receive power from the incoming pole at 400V, 3-phase and 50 Hz with an interlock mechanism, metering and protection devices.

Quantity: 1 set

Type: Indoor, self-supporting, metal-clad switchgear IP42

Rated insulation voltage: AC600V

Rated current: 600A

Control circuit voltage: AC 230V

Main breaker: MCCB 4P 225AF with mechanical interlock

Current transformer (CT): 3 sets, Molded type

Voltage transformer (VT): 2 sets, Molded type

Measuring instrument As shown on the drawings

Protective relay As shown on the drawings

Indications: 1 lot

Standard accessories: 1 lot

E-2. 自家発電盤 (DG Incoming Panel)

Purpose: To receive power from the stand-by generator at 415V, 3-phase and 50 Hz with an interlock mechanism, metering and protection devices.

Quantity: 1 set

Type: Indoor, self-supporting, metal-clad switchgear IP42

Rated insulation voltage: AC600V

Rated current: 600A

Control circuit voltage: AC 230V

Main breaker: MCCB 4P 225AF with mechanical interlock

Current transformer (CT): 3 sets, Molded type

Voltage transformer (VT): 2 sets, Molded type

Measuring instrument As shown on the drawings

Protective relay As shown on the drawings

Indications: 1 lot

Standard accessories: 1 lot

E-3. 低圧配電盤 (LV Distribution Panel)

Purpose: To distribute power to pump starter panels and other DBs at 400V, 3-phase and 230V, single phase with protection devices.

Quantity: 1 set

Type: Indoor, self-supporting, metal-clad switchgear IP42

Rated insulation voltage: AC600V

Rated current: 600A

Control circuit voltage:	AC 230V
Main breaker:	As shown on the drawings
Measuring instrument	As shown on the drawings
Protective relay	As shown on the drawings
Indications:	1 lot
Standard accessories:	1 lot

E-4. 取水ポンプ始動盤 (Intake Pump Starter Panel)

Purpose: To startup and control for the intake pump

Quantity: 2 sets

Type: Indoor, self-supporting, metal enclosed IP42

Rated insulation voltage: AC600V

Rated current: 200A

Control circuit voltage: AC 230V

Starter: VVVF (Variable voltage and variable frequency drive) with DOL bypass x1set

Type: Multi level voltage source inverter and PWM converter

Adapted motor: 11kWx1 submersible motor [KM-IP-1]

Main breaker: As shown on the drawings

Measuring instrument: As shown on the drawings

Control switch: As shown on the drawings

Protective relay As shown on the drawings

Indications: 1 lot

Standard accessories: 1 lot

E-5. 送水ポンプ始動盤 (Transmission Pump Starter Panel)

Purpose: To startup and control for the transmission pump

Quantity: 2 sets

Type: Indoor, self-supporting, metal-clad switchgear IP42

Rated insulation voltage: AC600V

Rated current: 200A

Control circuit voltage: AC 230V

Starter: Soft-starter with DOL bypass x1set

Adapted motor: 30kWx1 squirrel-cage motor [KM-TP-1]

Main breaker: As shown on the drawings

Measuring instrument: As shown on the drawings

Control switch: As shown on the drawings

Protective relay As shown on the drawings

Indications: 1 lot

Standard accessories: 1 lot

E-6. 非常用自家発電設備 (Stand-by Diesel Generator Set)

Purpose: To supply power as back-up

Quantity: 1 lot

Base rating: Prime

Output capacity: 100 kVA

Diesel engine: 1 set

Type: 4-cycle, turbocharged, radiator cooling

Capacity: 90kW or over for each set

Governing system: Electronic control

Engine silencer: 85 dB at 1m away

Radiator silencer: 85 dB at 1m away

Alternator: 1 sets

Type: Brushless, 4 pole, synchronous alternator

Output: 400V, 50Hz, 3 phase, 100kVA

Insulation: Class F

Housing: Acoustic enclosure, 85 dB at 1m away

Control pane: 1 set

Type: Indoor, self-supporting, metal enclosed, IP42

Rated voltage: AC 400V

System highest voltage: AC 600V

Measuring instrument: As shown on the drawings

Protective relay: As shown on the drawings

Control switch: 1 lot

Indication lamp: 1 lot

Day fuel tanks: 1 lot

Capacity: Capable for 24 hours continuous running at full loads

Accessories: Hand pump, Mechanical level indicator

Air intake filters: 1 lot, with sound attenuators

Standard accessories: 1 lot

E-7. 無停電電源裝置 (UPS)

Purpose: To distribute UPS power for instrumentations and monitoring equipment.

Quantity: 1 set

Type: Indoor, self-standing, metal enclosed, IP21

Input voltage: 230V \pm 10%

Output voltage: 230V \pm 2%

Capacity: 5kVA with 30 minutes backup

Battery: Sealed lead acid, Maintenance-free type

Charger: Silicon controlled automatic rectifier type for continuous use, 30A

Distribution board: MCCB30A, MCB x5

Protective relay: As shown on the drawings and the general specifications

Mounted device: As shown on the drawings

Indications As shown on the drawings

Standard accessories: 1 lot

E-8. 取水ポンプ現場盤 (Intake Pump Local Panel)

Purpose: To control the intake pumps by manual at the site

Quantity: 1 set

Type: Metal enclosed, with stanchion, Outdoor use, IP54

Rated insulation voltage: AC 600V

Control circuit voltage: AC 230V

Protective relay: As shown on the drawings

Mounted device: As shown on the drawings

Indications As shown on the drawings

Standard accessories: 1 lot

E-9. 送水ポンプ現場盤 (Transmission Pump Local Panel)

Purpose: To control the transmission pumps by manual at the site

Quantity: 1 set

Type: Metal enclosed, with stanchion, Outdoor use, IP54

Rated insulation voltage: AC 600V

Control circuit voltage: AC 230V

Protective relay: As shown on the drawings

Mounted device: As shown on the drawings

Indications As shown on the drawings

Standard accessories: 1 lot

E-10. 取水ピット水位計 (Intake Sump Level)

Purpose: To detect pump pit level for the intake pump control

Quantity: 1 set

Type: Electrode Type Level Switch

Measurement liquid: Raw water

Number of electrode: 3 pieces

Material of electrode: Stainless steel, type 304

Protection pipe: 1 lot

Mounting device and accessories: 1 lot

Standard accessories: 1 lot

E-11. 取水流量計 (Intake Flow)

Purpose: To measure and monitor intake flow

Quantity: 1 set

Type: Electromagnetic Flow Meter

Sensor

Fully submersible type, IP 68
Flange connection: ISO PN10
Material: body and flange: Stainless steel 304 or equivalent
Electrodes: Stainless steel 316 or equivalent
Size (diameter): 200A

Transmitter

Remotely installed from sensor, IP 54
Power: AC230V (UPS)
Indicator: Inbuilt flow rate and total flow display
Output: Isolated analog 4~20mA DC
Overall accuracy: better than +- 0.5%

Standard accessories: 1 lot

E-12. 取水濁度計 (Intake Turbidity)

Purpose: To measure and monitor intake turbidity
Quantity: 1 set
Type: Scattered laser type, LED and photo-diode receiver
Power: AC230V
Output: Isolated analog 4~20mA DC
Overall accuracy: better than +- 2.0%
Standard accessories: 1 lot

E-13. 浄水池水位計 (Clear Water Reservoir Level)

Purpose: To detect and monitor pump pit level for the transmission pump control
Quantity: 1 set
Type: Submersible type level meter
Measurement liquid: Clear water
Power: AC230V (UPS)
Output: Isolated analog 4~20mA DC
Overall accuracy: better than +- 1.0%
Protection pipe: 1 lot
Mounting device and accessories: 1 lot
Standard accessories: 1 lot

E-14. 送水圧力計 (Transmission Pressure)

Purpose: To detect and monitor for the transmission pressure
Quantity: 1 set
Type: Pressure gauge transmitter
Measurement liquid: Clear water
Power: AC230V (UPS)
Output: Isolated analog 4~20mA DC

Overall accuracy: better than +- 1.0%
Protection pipe: 1 lot
Mounting device and accessories: 1 lot
Standard accessories: 1 lot

E-15. 送水流量計 (Transmission Flow)

Purpose: To measure and monitor transmission flow

Quantity: 1 set

Type: Electromagnetic Flow Meter

Sensor

Fully submersible type, IP 68

Flange connection: ISO PN10

Material: body and flange: Stainless steel 304 or equivalent

Electrodes: Stainless steel 316 or equivalent

Size (diameter): 100A

Transmitter

Remotely installed from sensor, IP 54

Power: AC230V (UPS)

Indicator: Inbuilt flow rate and total flow display

Output: Isolated analog 4~20mA DC

Overall accuracy: better than +- 0.5%

Standard accessories: 1 lot

E-16. 計裝盤 (Instrumentation Panel)

Purpose: To accommodate devices for instrumentation and to monitor value of those.

Quantity: 1 set

Type: Indoor, self-standing, metal enclosed, IP42

Mounted device: As shown on the drawings

Indication: As shown on the drawings

Main components: PLC, Integrating flow recorder, GSM modem

Standard accessories : 1 lot

Note: The flow data shall be transmittable from the flow recorder by a removable device with CSV data format.

E-17. 監視盤 (Monitoring Panel)

Purpose: To monitor the process values and alarms at the monitoring room

Quantity: 1 set

Type: Indoor, wall-mounted, metal enclosed, IP22

Graphics: Acrylic board with printing screen type

Mounted device: As shown on the drawings

Indication lamp: As shown on the drawings

Standard accessories: 1 lot

E-18. 高架水槽水位計 (Water Tower Level)

Purpose: To detect and monitor water tower level for the transmission pump control

Quantity: 1 set

Type: Submersible type level meter

Measurement liquid: Clear water

Power: AC230V (UPS)

Output: Isolated analog 4~20mA DC

Overall accuracy: better than +- 1.0%

Protection pipe: 1 lot

Mounting device and accessories: 1 lot

Standard accessories: 1 lot

E-19. GSM モデム (GSM Modem)

Purpose: To collect the water level signal and send alarm signals to the instrumentation panel in WTP by GSM network.

Quantity: 1 set

Type: GSM telemetry data transmitter, IP67

Power: AC230V (UPS) with battery backup

Transmission data: HH, H, M, L, LL and power failure

資料-7 その他の資料・情報（収集資料リスト）

調査名：スリランカ国キリノッチ上水道復旧計画準備調査

番号	名 称	形態 図書・ビデオ 地図・写真等	オリジナル・コピー	発行機関	発行年
1	MAHINDA CHINTANA / Vision for the Future 国家開発方針	図書	コピー	財務計画省 国家計画局	2010.8
2	要請書の根拠資料	図書	コピー	上下水道省 国家上下水道公社	2010.8
3	上下水道事業進捗一覧	図書	コピー	上下水道省 国家上下水道公社	2010.11
4	北部州キリノッチ及び周辺地区地下水開発機械 購入及びキリノッチ上水道施設緊急改善計画書 (2KR 見返り資金活用要請書)	図書	コピー	上下水道省 国家上下水道公社	2011.2
5	キリノッチ県水道開発計画	図書	コピー	上下水道省 国家上下水道公社	2003.2
6	キリノッチジェネラル病院及び軍駐屯地汚水処理 見積計画書	図書	コピー	上下水道省 国家上下水道公社	2011.5
7	ジャフナ半島給水計画に関するイラナマドゥ貯水 池分水協議同意書	図書	コピー	灌漑局及び国家上下水道公社	2007.9
8	RATES 2011	図書	コピー	上下水道省 国家上下水道公社	2011.4
9	RATES 2010	図書	コピー	上下水道省 国家上下水道公社	2010.4
10	RATES 2009	図書	コピー	上下水道省 国家上下水道公社	2009.4
11	RATES 2008	図書	コピー	上下水道省 国家上下水道公社	2008.4
12	DESIGN MANUAL (RURAL WATER SUPPLY)	図書	コピー	上下水道省 国家上下水道公社	1988.8
13	DESIGN MANUAL (URBAN WATER SUPPLY AND SANITATION)	図書	コピー	上下水道省 国家上下水道公社	1989.3
14	DESIGN MANUAL (WATER QUALITY AND TREATMENT)	図書	コピー	上下水道省 国家上下水道公社	1989.3
15	DESIGN MANUAL (GROUND WATER)	図書	コピー	上下水道省 国家上下水道公社	1989.3
16	DESIGN MANUAL (MECHANICAL ELECTRICAL AND INSTRUMENTATION ASPECTS OF WATER SUPPLY DESIGN)	図書	コピー	上下水道省 国家上下水道公社	1988.8

番号	名 称	形態 図書・ビデオ 地図・写真等	オリジナル・コピー	発行機関	発行年
17	DESIGN MANUAL (GUIDELINES FOR LATRINE SELECTION AND CONSTRUCTION)	図書	コピー	上下水道省 国家上下水道公社	1988.5
18	DESIGN MANUAL (WASTEWATER TREATMENT)	図書	コピー	上下水道省 国家上下水道公社	1989.3
19	DESIGN MANUAL (WATER SERVICE CONNECTIONS)	図書	コピー	上下水道省 国家上下水道公社	1989.3
20	DESIGN MANUAL (PLUMBING CODE)	図書	コピー	上下水道省 国家上下水道公社	1989.7
21	道路舗装及び埋設標準図	書類	コピー	道路開発庁 (RDA)	—
22	Statistical Handbook 2010	図書	コピー	キリノッチ郡	2010
23	District Coordinating Committee Meeting Report	書類	コピー	キリノッチ郡	2011.4
24	The Gazette of the Democratic Socialist Republic of Sri Lanka/1534/18-Friday 2008.02.01 PART1: SECTION (1) – GENERAL Government Notifications NATIONAL ENVIRONMENTAL ACT, No.47 OF 1980		コピー	スリランカ国政府	2008.2
25	IMSMA Completion Survey (Water Intake, WTP Site)	書類	コピー	UNDP Regional Mine Action Office (North)	2011.09.08
26	IMSMA Completion Survey (Killinochchi Central College Water Tower Site)	書類	コピー	UNDP Regional Mine Action Office (North)	2011.09.08
27	IMSMA Completion Survey (Paranthan Water Tower Site)	書類	コピー	UNDP Regional Mine Action Office (North)	2011.09.08