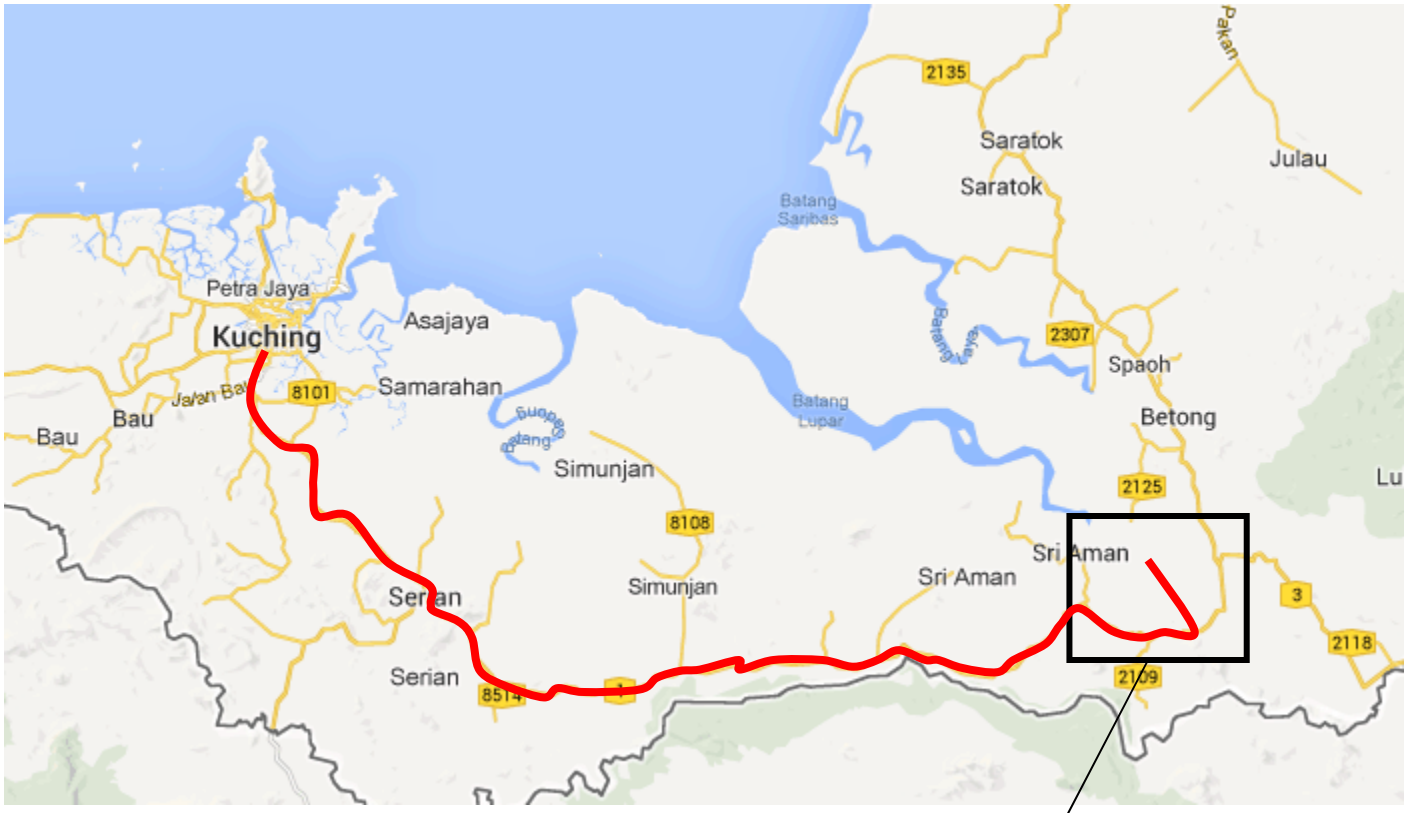
Community Service Rumah Amut of Langkang Ili

Background

Rumah Amut in Langkang Ili is a 15-door Iban long house that was established in the early 1900. It lies on the left bank of Batang Lupar, about 25km downstream from the Engkilili town. It is located in the Engkilili District, Sri Aman Division, Sarawak in the midst of an Oil Palm Plantation. The 225km journey from Kuching is mainly on the Pan Borneo highway, a single carriageway that links most of Sarawak main towns. The last 20km is by gravel road through the oil palm plantation and accessible by 4-wheel drive vehicles. The journey each way is slightly under 4 hours from Kuching.

A site visit to the longhouse on September 1, 2013 was undertaken by 7 RCKC Rotarians led by PE Louis Yong and Community Service Chair, Richard Wong together with family members. Technical specialists for solar power and plumbing also joined us for this site visit.

The 3 maps below showed the location of Rumah Amut of Langkang Ili in increasing enlargement with a fourth map showing long houses in surrounding areas.


Kuching
Petra Jaya
Asajaya
Samarahan
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Jalan Ba
8101
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Serian
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Batang Sanibas
Batang Lupar
Saratok
Saratok
2135
Julau
Pakan
2307
Spaoh
Betong
2125
Sri Aman
Sri Aman
3
2118
2109


Rumah Amut, Langkang Ili
20km Plantation Road
Main Road
Sri Aman
Taman Tiara
Taman Wawasan
Taman Vistagro
Taman Sentosa Indah
Kampung STC
Taman Gainang Height
2105
Jalan Pulis
Tebarong
Pentik
Spalan
Secarat Baru
Secarat Salin
Jelukong
Engkilili
Kampung Bayai
Kampung Nanga Klasin
Kampung Guntong Hulu
Kampung Guntong Tengah
Sungai Antu
2109
Sengang Hulu
Sengkuang Hilir
Kampung Empadi Tengah
Empadin Batu Anchau
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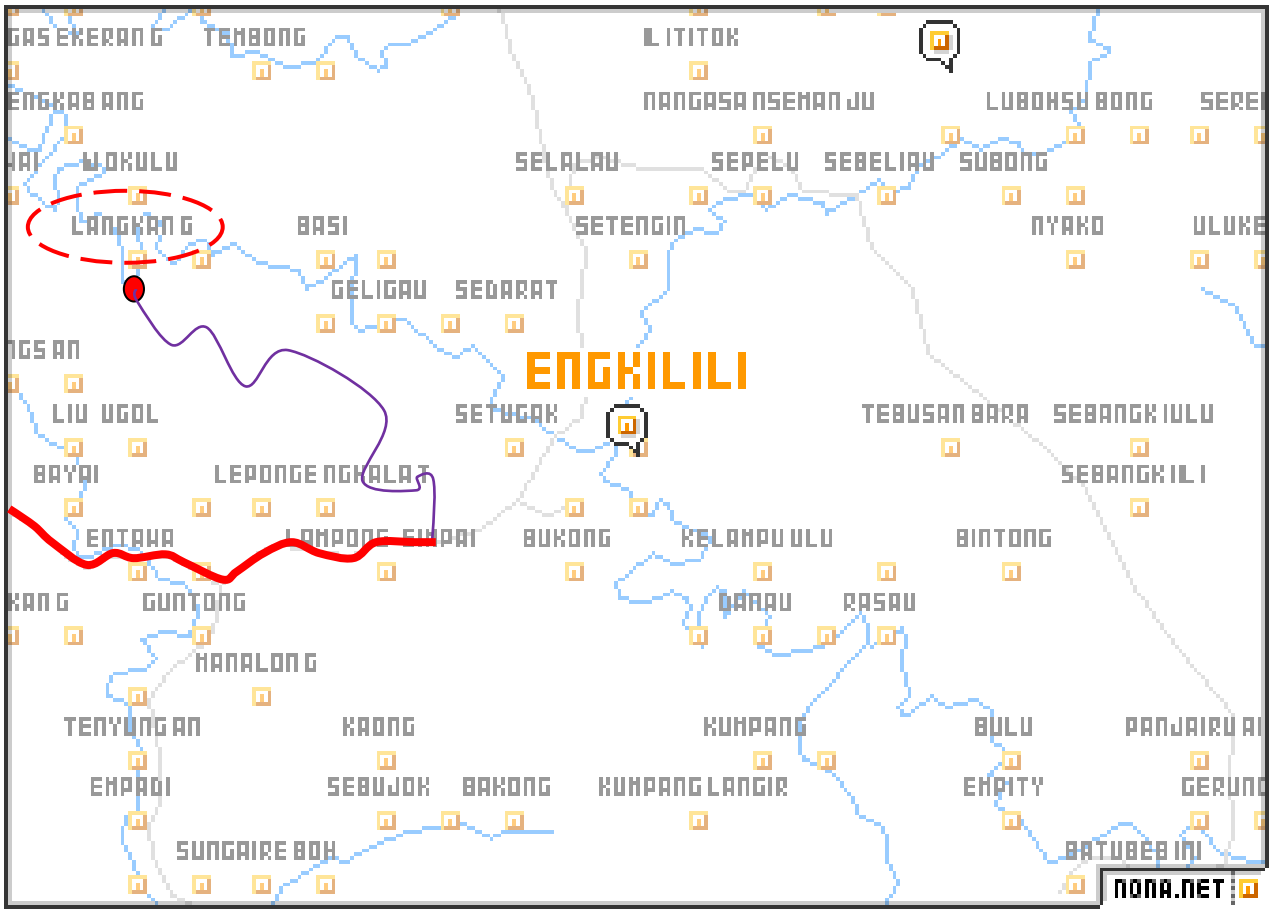
ENGKILILI DISTRICT, SARAWAK - LOCATION OF LARGER LONGHOUSES

Langkang Ili is 25km downstream from Engkilili town & 20km via gravel road (in purple) through oil palm plantation land from Pan Borneo Main Road turnoff.



Site Conditions

Langkang Ili Longhouse Frontage with subsistence farming in compound

Batang Lupar flowing in front of Longhouse (infested with crocodiles & polluted by fertilizers)

Rudimentary Jetty (piece of log with cut out steps) for river water collection & river transport access

Longhouse rear view

Typical Washroom

Typical Kitchen

Typical Dining room

Typical Bedrooms

Typical Living room

Common Corridor

Outdoor Verandah

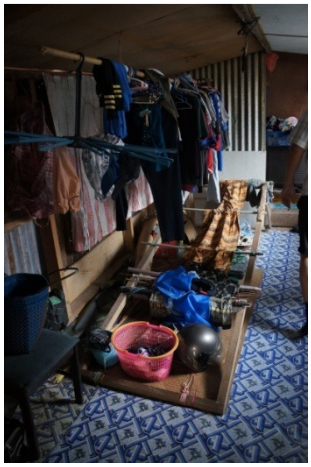
Headman Amut ak Joan

Biscuits gifts for longhouse residents

Gifts presentation by Community Service Chair

Consultation with Residents

Weaving Loom



Bamboo Chicken

Visiting Rotarian Family members

Main Water Source in nearby hill

PVC pipe deliver water to Longhouse

Residents & Living Conditions

There are 17 families residing in this longhouse headed by Tuai Rumah Amut ak Joan. 10 families comprising 46 family members are full time residents while the remaining 7 families with 59 members reside & work in neighboring towns and returned to the longhouse during festive seasons, school & public holidays. All full time residents are subsistence farmers working on small plots of land surrounding the longhouse. Income is supplemented from daily paid work at the surrounding oil palm plantation at US$5.00 per day.

The plight of the longhouse residents was brought to the attention of RCKC by one of its residents, Mr Ruekeith Jampong. The longhouse does not have electricity supply ever since their generator set broke down about 10 years ago. Even when it was operating normally, the generator set was used sparingly due to limited funds for purchase of diesel fuel. Basic lighting is now derived from low lumens kerosene lamps.

The residents used to have piped water from a natural reservoir in the nearby hills a few kilometers away. However, the PVC water supply pipes were repeatedly damaged by heavy machineries when the surrounding oil palm plantation started land clearing in 2007. At the beginning of 2013, water supply slowed to a trickle after the arrival of contractual Indonesian laborers at the Oil Palm

Plantation started competing for water from the same source. Drinking & cooking water is now sourced from ad hoc rainfall collection while that for bathing and toilet flushing are obtained from the river.

Water collection from the river is a risky affair with the ever vigilant watch for crocodiles. The rudimentary "jetty" to the water edge comprises a small log with cut out steps as shown in the photo above. The residents opined that water from the river is contaminated with fertilizers runoff from the neighboring oil palm plantation. They have refrained from drinking it or cooking / washing their utensils with it. In times of prolonged drought, bottled water is used but sparingly.

We have collected water samples for laboratory testing in Kuching and await its results. If feasible, a manual water filtration solution will be implemented.

Dialogue Session

A dialogue session was subsequently held with Headman Amut & the rest of residents to seek their views and feedback on their requirements. Common themes can be summarized as follows :

- regular supply of uncontaminated water for drinking, cooking & washing
- mitigate risk of crocodile attacks when sourcing river water for bathing & water closet sanitation use
- a few hours of lightings in the evenings to enhance time for handicraft work to supplement income & for communal bonding
- compound illumination at night for safe passage between main longhouse and independent household extensions nearby
- power to charge cellular phones to enable regular communications with love ones studying in Boarding Schools or working in urban areas
- the availability of regular water supply and basic lighting will improve quality of life and encourage non-residents to spend more time at the longhouse

Proposed Clean water & regular water Solutions

A - Rainwater channeled to each household

It is observed that the longhouse has a newer section in the front portion with good & even plane roof structure, ideal catchment for systematic collection of rain water. This section was re-build in 2000 after a fire destroyed a major portion of the longhouse in 1997.

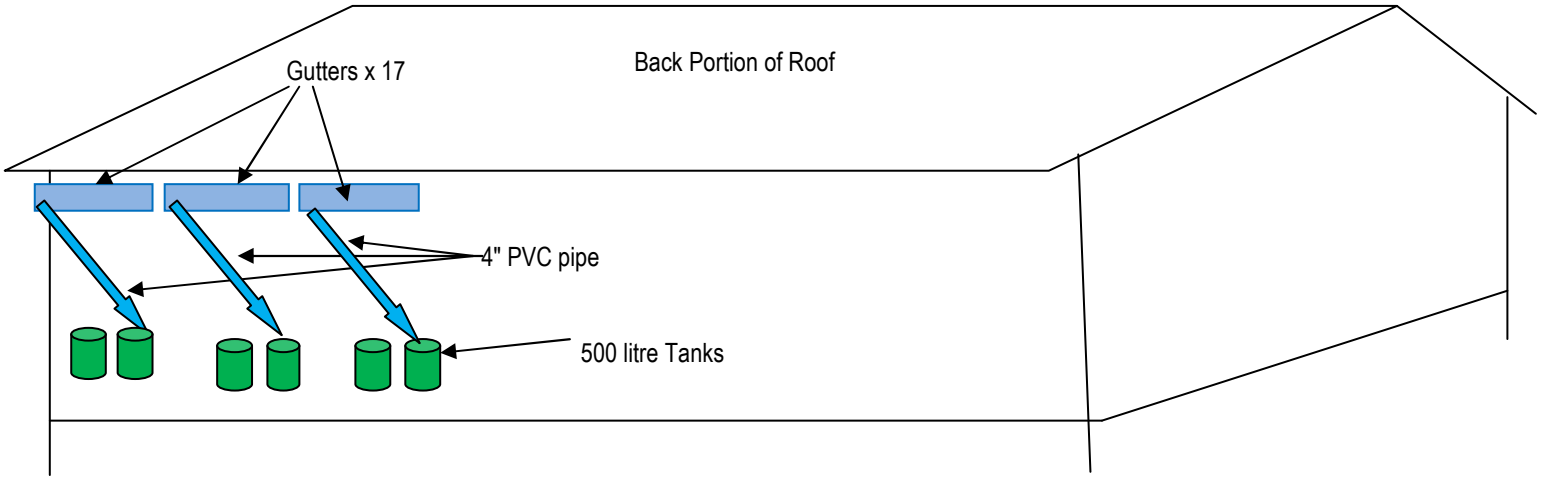
It is proposed that each household will have its own length of gutter at each section of their longhouse back roof of the new section to direct water to their respective washroom and toilet area.

Each household section of roof catchment area measures about 45m2. An inch or 25mm of rainfall will be sufficient to fill up 1000 litres tank capacity, even at 85% water collection.

PVC gutters with its accompanying clips materials will be sourced from Suppliers and provided to the longhouse residents to be installed along the edge of roof eaves that is made of belian wood . The residents will affix the gutters themselves as a communal undertaking. 2 x 500 litres sturdy PE water containers will be provided for water storage for each household.

The gutters will be installed by the longhouse residents on a joint communal basis with some allowances for food and drinks. It is estimated to take about 5 working days to installed all 17 set of gutters for the 17 families.

Sketch of individual household water collection



Estimated Budget (A)

Description	Unit Price (M$)	Quantity	Total (M$)
5m PVC Gutters, couplings & Clippings + 10m PVC 4" pipes	RM 400.00	17	RM 6,800.00
500 litre water containers	RM 200.00	34	RM 6,800.00
Transportation	RM 1,000.00	1	RM 1,000.00
Installation Costs by residents (food allowances-days)	RM 200.00	5	RM 1,000.00
			RM 15,600.00

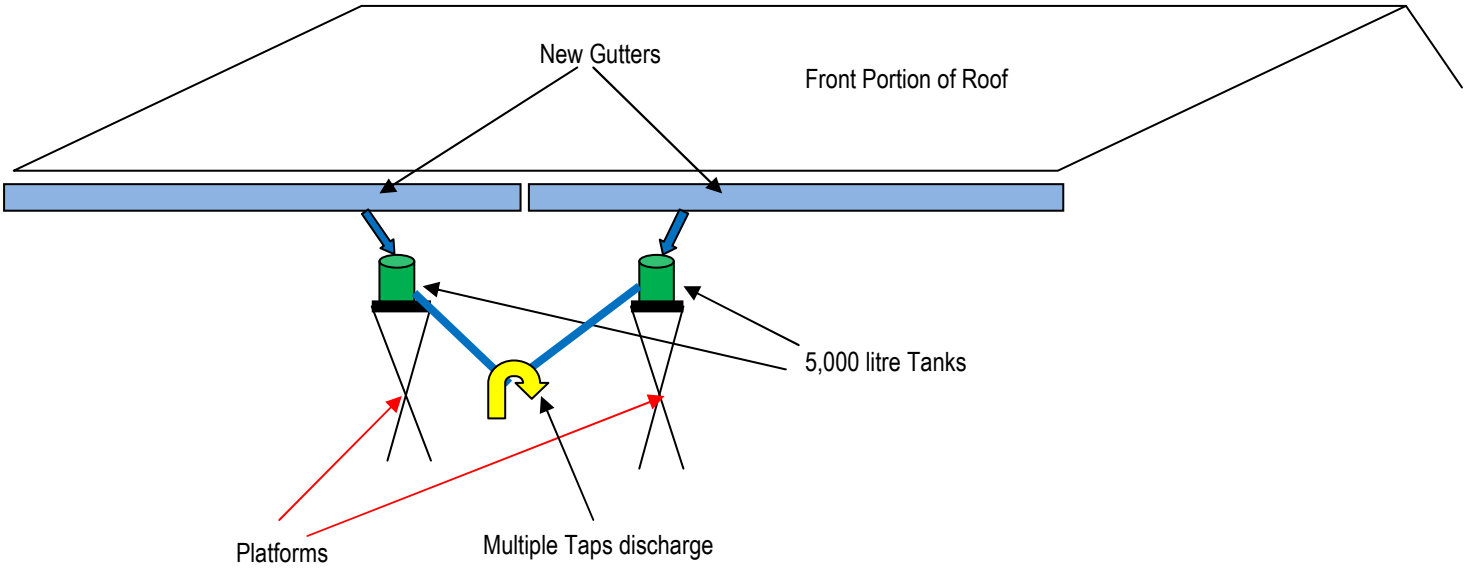
B - Rainwater Collection for Communal Usage

Similarly, the 45 metre long front portion of the longhouse roof can be additionally used to increase rainwater collection for communal use. Gutters can be affixed to the edge of the front roof wood eaves with rainwater collected piped to a couple of large water storage tanks (5,000 litres).

Larger new water tanks (5000 litres) have to be placed on platforms of about 2.5 metres height to allow for gravity fed water supply to its discharging taps for communal use in front compound. The raised water tanks also serves as protection against year-end rainy season flooding that may contaminate water stored in these tanks.

These gutters and pipes will also be installed by the longhouse residents with some expenses for food and drinks.

Sketch of Communal water collection



Budget (B)

Description	Unit Price (M$)	Quantity	Total (M$)
50m Gutters, couplings & Clippings + PVC 4" pipe	RM 4,000.00	1	RM 4,000.00
5000 litre Polystor HDPE Storage tanks	RM 3,000.00	2	RM 6,000.00
Stainless steel Taps, accessories & fittings	RM 500.00	6	RM 3,000.00
Steel fabricated platforms	RM 3,000.00	2	RM 6,000.00
Transportation	RM 2,000.00	1	RM 2,000.00
Installation Costs by residents (food allowances)	RM 200.00	5	RM 1,000.00
			RM 22,000.00

C - Sourcing Water from River

It is proposed that river water be pumped via 2" UPVC pipes to a third communal water tank located near the front of the longhouse. This is to reduced risk associated with wadding into crocodile infested waters as well as providing sufficient water for bathing and sanitary uses during prolong spells without rain.

The tank will be sited on a suspended concrete slab to facilitate open air bathing activities and be placed on a low steel fabricated platform for gravity feed water effects. A petrol operated pump with efficient fuel consumption will be placed on the platform to draw water from the river. This will allow for open-air bathing without the need to transport water to longhouses individual household washrooms.

Budget (C)

Description	Unit Price (M$)	Quantity	Total (M$)
80m UPVC 2" pipe with couplings & support	RM 3,000.00	1	RM 3,000.00
5000 litre Polystor HDPE Storage tanks	RM 3,000.00	1	RM 3,000.00
Stainless steel taps, accessories & fittings	RM 500.00	4	RM 2,000.00
Petrol operated pump	RM 1,500.00	1	RM 1,500.00
Steel fabricated platforms & housing for pump	RM 3,000.00	1	RM 3,000.00
Suspended concrete with some piling	RM 5,000.00	1	RM 5,000.00
Transportation	RM 2,000.00	1	RM 2,000.00
Installation Costs by residents (food allowances-days)	RM 200.00	5	RM 1,000.00
			RM 20,500.00

Basic Lightings

It is recommended that solar panels system be installed to provide power for basic LED lightings and to charge cellular phones. Each household will have a standalone solar home system that can lit eight 9W T5 LED lights for 4 hours within their own household and common corridor. The solar panels will be mounted on the longhouse roof. For compound illumination, each household will have an outdoor 9W T5 LED light which will lit for 12 hours. These will be placed under the roof eaves, alternating with one in the front outside verandah and the next household in outside back portion of longhouse for both front & back compound illumination.

An additional set of solar panel & its system will be placed at the jetty shed to provide illumination for compound near the river jetty. This should facilitate night river transportation in the event of a medical emergency evacuation.

The longhouse has good cellular phone coverage by all 3 local cellular telecommunications service providers. The ability to regularly charge cellular phones will improve connectivity with loved ones that are working or studying in nearby towns. It will also be most useful in the event of medical or other emergencies.

Solar panel system was selected as power source as it requires very basic maintenance that can be easily imparted with some training by supplier. The operational cost is also virtually zero for the first 5 years with an expected battery change only required every 5 years or so. The German made deep cycle 135Ah 12Volt battery is designed to discharge only up to 50% of its power storage so as to prolong battery life. Both the 135Wp solar panels, made in USA and 200Watt Swiss made inverters have lifespan of over 20 years. The 135 watt solar panels will still have 80% capacity after 20 years. The inverters are over-sized at 200W instead of just above 135W to ensure longer lifespan.

The 9W LED T5 light bulbs costs only US$10.00 each and has a lifespan of up to 30,000 hours or over 10 years based on proposed circuit design. These light tubes can be purchase from any local electrical retail shop and will get progressively cheaper as more LED bulbs are manufactured.

The stand alone solar system for each household ensures that there is no dispute with uneven power usage by each household as compare to that of a communal setting where higher usage by some may deprive others. Each household takes control of their own power supply & power usage. To ensure power is only used at night when intended, photo cells circuits are embedded to activate the battery current only in the late evening when daylight dims.

Budget (Solar system)

Description	Unit Price (M$)	Quantity	Total (M$)
135W stand Alone Solar home system with 200W inverter, 135Ah 12V battery & cabling	RM 7,000.00	18	RM 126,000.00
PV module aluminum mounting track	RM 250.00	18	RM 4,500.00
Night Function inverter with photocell	RM 120.00	18	RM 2,160.00
T5 9W LED lights with housing	RM 35.00	162	RM 5,670.00
Cabling in surface run conduits for LED lights	RM 180.00	18	RM 3,240.00
Installation, testing & Commissioning	RM 300.00	18	RM 5,400.00
Transporting materials to site	RM 2,000.00	1	RM 2,000.00
			RM 148,970.00

Overall Budget Summary

Description	Total (M$)	FX	Total (US$)
Water (A) - Households	RM 15,600.00	3.2000	$ 4,880.00
Water (B) - Communal	RM 22,000.00	3.2000	$ 6,880.00
Water (C) - River	RM 20,500.00	3.2000	$ 6,410.00
Solar Powered Lightings	RM 148,970.00	3.2000	$ 46,550.00
Publicity, Signages	RM 3,500.00	3.2000	$ 1,090.00
Preliminary Site Inspection by Technical specialists	RM 1,000.00	3.2000	$ 310.00
	RM 211,570.00		$ 66,120.00

Funding Sources

Our international partner and sister club, RC Seosan & clubs from District 3620 had committed US$10,000 to this project. DGSC Moon had confirmed that District 3620 will allocate US$10,000 from their DDF. Several clubs in our District 3310 (as listed below) as well as RC Golden Eagle Taipei of District 3480 had indicated their interest in participating. We need District 3310 Grants Committee endorsement and funding from our DDF before application will be submitted to TRF.

SOURCES	US$
RC Kuching Central (local partner), District 3310	$ 2,000.00
RC Bandar Seri Begawan, District 3310	$ 2,000.00
RC Singapore East, District 3310	$ 1,000.00
RC Suntec City, District 3310	$ 1,000.00
RC Singapore E Club, District 3310	$ 1,000.00
RC Tanjong Pagar, District 3310	$ 1,000.00
RC Queenstown, District 3310	$ 1,000.00
RC Golden Eagle Taipei, District 3480	$ 1,000.00
Proposed District 3310 DDF	$ 8,000.00
RC Seosan (International Partner), District 3620	$ 3,000.00
RC Sae-Seosan, District 3620	$ 1,000.00
RC Daesan, District 3620	$ 1,000.00
RC Buseong, District 3620	$ 1,000.00
RC Seosan-Boramae, District 3620	$ 1,000.00
RC Seosan-Seoju, District 3620	$ 1,000.00
RC Seosan-Gookhwa, District 3620	$ 1,000.00
RC Seosan Taesan, District 3620	$ 1,000.00
District 3620 DDF	$ 10,000.00
TRF 100% matching global grant for DDF	$ 18,000.00
TRF 50% matching global grant for Participating Clubs	$ 10,000.00
	$ 66,000.00

Project Sustainability

The project has been designed to ensure long term sustainability with minimal input from end users. Robust materials are selected for durability and basic training for end users will be given by suppliers to ensure optimal use.

The installed roof gutters will facilitate the efficient collection of water with a dedicated 4" PVC pipe directing water to the respective families washrooms. This system has very minimal maintenance with the removal of fallen leaves & debris from the gutters once in awhile. The high grade PVC gutters and pipes are expected to last at least 10 years of normal usage. It is estimated that 2 x 500 litre of water storage container is sufficient to last a family of 5 for a couple of days for normal usage. 500 litre tanks are chosen to mitigate weight loading at washroom areas. The system can be expanded easily with the addition of more containers if higher water storage requirement is needed.

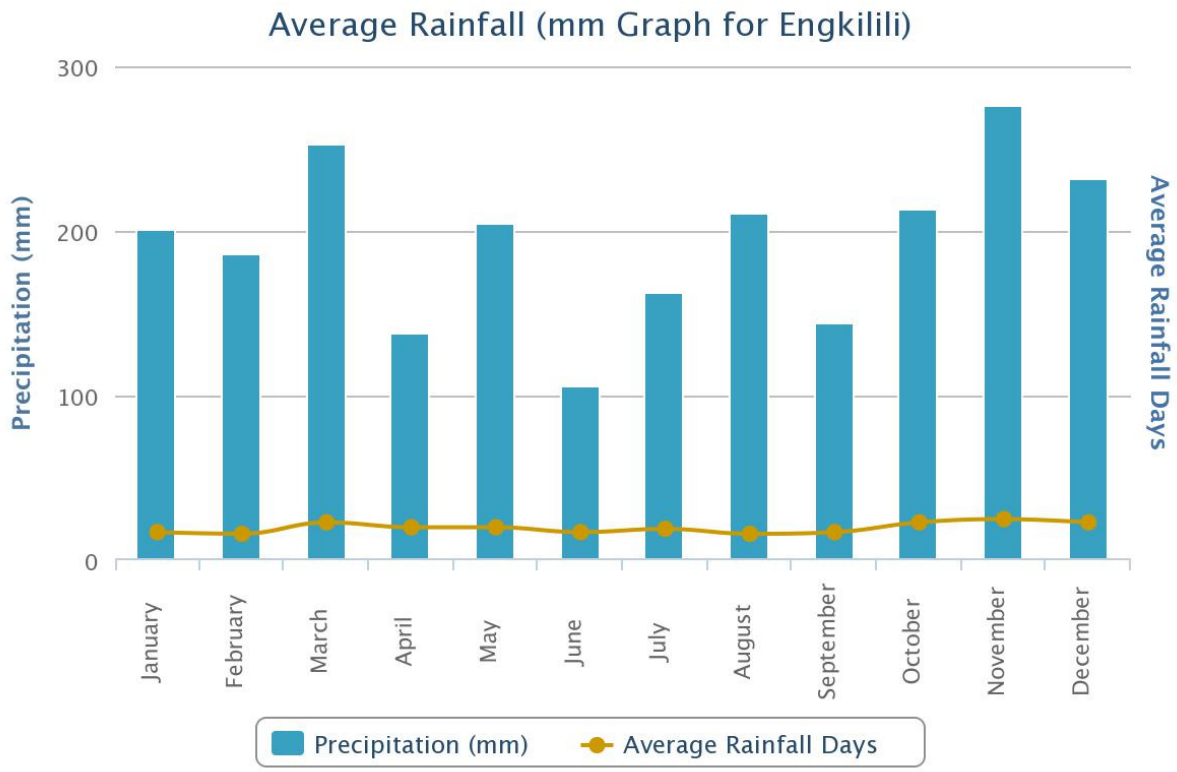
This simple methodology to maximize collection of rainwater from existing structures in Section B and its subsequent storage for future consumption supplements the water collection for household use in Section A. The system is easy to maintain with only removal of debris collected at gutters required periodically. The ultra violet light resistant water storage tanks will prevent the growth of algae inside tanks' stagnant water if there is prolong period of none usage of these stored water. Stainless steel taps and plumbing accessories will be used to prolong lifespan. The system capacity can be expanded with additions of water storage tanks should the need arise. Damaged & worn PVC gutters and pipes can be easily replaced by residents as they are instrumental in its installation. These materials are reasonably priced and readily available in local hardware stores. The high grade UPVC water tanks have a lifespan of more than 30 years.

The petrol pump selected for Section C has very fuel efficient consumption where a tank of 5 litres of petrol gives 2 hours of operating time whilst moving 600 litres of water a minute. It takes less than 10 minutes and about RM1.00 (US$0.30) worth of fuel to fill up a 5,000 litre tank, about a day's worth of water consumption. The residents will be trained on how to operate the simple pump with regular servicing. These pumps are low maintenance off the shelf items and can easily be repaired by pump mechanics in the event of breakdown. The water tank will be fitted with a release valve at the base to periodically discharged river water sediments that have settled down at the base of the tank.

A study of rainfall pattern in the area indicates a minimum of 16 days of rain for each calendar month. Minimum precipitation which occurs in June amounted to more than 100mm, sufficient for residents basic needs. The longhouse is located downstream from a dam reservoir. The large river where water is pumped for bathing and sanitary needs have ample water flows.

Appended below is a table showing precipitation and number of rain days per month in the Engkilii area.

Average Precipitation (mm) & Rainfall Days for Engkilili, Malaysia



Month	Average Rainfall Days
JANUARY	17
FEBRUARY	16
MARCH	23
APRIL	20
MAY	20
JUNE	17
JULY	16
AUGUST	19
SEPTEMBER	17
OCTOBER	23
NOVEMBER	25
DECEMBER	17

Reference : WORLD WEATHER ONLINE
http://www.worldweatheronline.com/Engkilili-weather-averages/Sarawak/MY.aspx

Basic electricity is provided by solar panels with its low maintenance and zero operating costs. LED lights are selected for its life span longevity of about 50,000 hours or over 20 years durability at 6 hours of lighting a day. The solar panels are sourced from United States and have a life span of at least 20 years at not more than 20% degradation. Batteries from Germany are used to store electricity generated. They are slow discharged type with life span of 4-5 years when minimal reserves are set 30% of battery capacity. Training will be given to residents by solar panel specialist installers.

Club Rotarians with expertise in Mechanical and Electrical field has been roped in to assist in designing this project. Implementation will be a hands-on affair with Rotarians sourcing materials directly from suppliers and arranging cost effective logistical requirements. Installation of gutters and construction of platforms to support water tanks will be undertaken by the residents themselves with supervision from Club Rotarians. Financial oversight will be under the purview of a Committee of senior Rotarians headed by the Club President.

The availability of regular clean water supply and basic electricity lighting will improve the quality of living for the 105 residents of Rumah Amut.

This proposal was approved by RC Kuching Central Board of Directors on September 14, 2013. We submit this application for District 3310 Grants Committee evaluation and endorsement. Firm quotations will be sourced from appropriate contractors and suppliers once we have a favorable response from District Grants committee. Thank you.