The Leprosy Concern by Hong Kong South Rotary Club in 2016

Butuo Water Project in Liangshan, Sichuan

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Today is the last Sunday of January---the World Leprosy Day. Many people believe that leprosy is just a disease of ancient times that was occasionally mentioned in the Bible. But the reality, for many millions, is that it is still a devasting disease of today. Leprosy was said to be first recognized in the ancient civilizations of China, Egypt, and India, according to the World Health Organization (WHO). Leprosy, also known as Hansen's disease, was officially eliminated at the national level in China by 1982, meaning prevalence is lower than 1 in 100,000. Though leprosy has been brought under control in general, the situation in some areas is worsening, according to China's Ministry of Health. In the past, leprosy sufferers were ostracized by their communities as the disease was incurable, disfiguring, and wrongly thought to be highly infectious.

There are estimates show that 200,000 people in China today who have recovered from the disease but more than half (110,000) are disabled due to the disease, with conditions ranging from blindness to disfigurement. Although these former leprosy sufferers were cured in the last 50 years, many of them still suffer serious pain and difficulties because of these disabilities/deformities and the stigma. This social stigma has become the main problem in leprosy diagnosis and treatment today. Mostly, cases of infection remain in impoverished parts in the southwestern provinces of Yunnan (雲南), Guizhou (貴州), and Sichuan (四川), and Tibet (西藏) in the west and Hunan (湖南) in the south. Other provinces/municipalities affected on a smaller scale, are Anhui (安徽), Qinghai (青海), Chongqing (重慶), Guangdong (廣東), and Shaanxi (陝西).

Rotary Concern on Leprosy

The global concern on leprosy by Rotary can be dated back to the 1920s. Over the decades, many Rotary clubs in various countries had conducted projects towards the betterment for the leprosy sufferers.

In China, several Shanghai (上海) Rotarians led by Dr. Fong Foo-Sec (鄺富灼博士) (Rotary International Director 1933-1934) had initiated the formation of the first Chinese Mission to Lepers (中華麻瘋救濟會) in 1926. Former Kunming (昆明) Rotarian Dr. Alexander James Watson (華德生醫師), and Hangchow (杭州) Rotarian Dr. Stephen Douglas Sturton (蘇達立醫師) were both British superintendents of the local Anglican Church leper hospitals in the 1930s-1940s. Dr. Lim Boon-Keng (林文慶醫師), President 1935-1936 of Amoy Rotary Club (廈門扶輪社), was one of the founders and a director of the Amoy Leprosy Clinic under the auspices of the Rotary Club. The

former Canton Rotary Club (廣州扶輪社) had also sponsored relief projects to the leper settlements located in the very remote hilly areas of Ch'ing Yuen (*Qingyuan*) (清遠) and Pak Hoi (*Beihai*) (北海) within Kwangtung (*Guangdong*) Province (廣東省). In 1987, Japanese Rotary clubs, in cooperation with Rotarians in Hong Kong (香港) and Taiwan (臺灣), and the Rotary Club of Cebu-Fuente, The Philippines, had begun a program to eliminate leprosy in Cebu of the Philippines, with the help of Special Grant from The Rotary Foundation. The list may be longer in the last century.

In this new millennium, in the mountains of southern Sichuan (四川), China, 400 people with leprosy and their families are receiving medical vocational services through the "Liangshan Leprosy Project" (涼山州麻風病綜合防治項目). An initiative launched by the Rotary Club of Hong Kong South (香港南區扶輪社) in the last two decades, it maintains 9 centers with a full time staff of doctors, nurses, and community development officers. Patients' relatives receiving training in trades such as beekeeping, pig farming, and embroidery.

Barrister Nicholas Pirie, a hands-on-service insisting Rotarian, a past president in 2008 of the Hong Kong South Rotary Club, is the key leader of the leprosy concern initiative. He took his first trip to Sichuan in 2000 to see first-hand the living conditions of the people affected by leprosy and has visited numerous times since then. In view that Rotary Club(s) cannot be qualified legally to be the practical operator of the 9 centers in the Liangshan Leprosy Project, it is in turn to incorporate in the Hong Kong SAR a limited liability company in 2007 as approved by the local bureaus of Civil Affairs (民政局) and Public Security (公安局)---"The Leprosy Project Ltd. 清風福康計劃" (TLP).

In addition to the Hong Kong South Rotary Club committee led by Nicholas Pirie, there are also Rotarians from Quarry Bay Rotary Club (鰂魚涌扶輪社) to join the TLP governance: Anthony Leung (梁德安) (*Organic cotton terry products manufacturer*); Swee Hock Chew (*Accountant*); John Bowden (*Architect*); plus several volunteers from various professionals of the Hong Kong community.

The Leprosy Project (TLP) (a NGO by limited liability)

The Leprosy Project aims to help prevent and treat leprosy, as well as provide support for those afflicted. The strategy of TLP is to run a comprehensive set of programs developed in full consultation of the village communities in order to not only address medical issues of those afflicted, but also to address economic, infrastructure, education and nutritional issues. The Project arranges medical visits and trains local doctors and villagers about the disease, and has helped build irrigation systems. The Leprosy Project currently serves 16 villages in the mountainous south-eastern area of rural Sichuan province. Many of the people TLP works with are ethnic minorities.

The organization has managed to prevent any new cases of leprosy occurring in all of the villages in which it operates, in addition to many other achievements, including a massive reduction in ulcer cases, provision of over 1,000 pairs of shoes, prosthetics, bursaries for children to attend school, and the arrangement of 25-30 eye surgeries each year. The effort was supported by the Kadoorie Charitable Foundation (嘉道理基金會), and also Swire Trust (太古集團慈善信託基金) in Hong Kong.

In 2016, TLP completed their Water Project Program, which with the financial assistance of Rotary Clubs around the world, as well as the Rotary Foundation of Rotary International, built an extensive irrigation system in the area of Butuo County.

Butuo Water Project in Liangshan, Sichuan

Project Location

Butuo County (布拖縣) is located in the eastern side of Liangshan (涼山彝族自治州), Sichuan Province (四川省), China. The leper village was built in 1966 on a mountain accessible only by unpaved footpaths on very deep slopes. It spans on wide height range, rising from 500 meters above sea level to 1,500 meters. It takes 3 hours to walk from the village to the nearest market.

The population was about 106 in 60 households of whom were ethnic Yi nationality (彝族). About 46 people affected by leprosy, among them 29 with visible disabilities. Villagers live in 4 clusters and work on a total of 580 acres of arable land. The soil is rocky and the productivity is slow. Villagers live on subsistence level and earn their income mainly from selling corn. Most of them raise some pigs and chickens for their own consumption during celebrations and festivals.

Partial power supply was generated by a micro hydro-generator made by the villagers. Communal water taps were installed in all of the four groups. Villagers live in old, poorly ventilated rammed earth houses. There were no medical facilities.

There was one primary school, which was built in 2005. There were 2 teachers and 42 students. Only one class was opened in each school year.

The Need – Improving the water supply for the villages of Butuo

The villages of Butuo have experienced worsening drought conditions over the last decade. For half of the year little rain falls and little water was available to the communities. What water they could gather was poorly collected with little water storage available. Lack of water has reduced crops and made hygiene maintenance difficult. Whole crops have been lost in the past 2 years through drought. Diarrhea and similar hygiene-related conditions, together with malnourishment, and poor disease resistance were commonplace and could be fatal. Improving the supply and use of water in the communities could save lives and improve the community's health and opportunities.

Butuo is a cluster of 4 villages. The clusters are located in a deep valley above the Xixi River (西溪河/西澤河). Villages 3 and 4 are at 3,800 feet and villages 1 and 2 are higher at 4,800 feet. It is a two-hour hike between the two groups. The clusters' main buildings, school and clinic are at the higher elevation and serve all the villages. Villagers keep livestock and tend terraced fields. They irrigate some for paddy fields at the lower villages only. Water is from natural springs some distance from the villages and is reduced by 80% and more in the winter months. There is one shared source for villages 1 and 2. Villages 3 and 4 each have their own source. Each village has a concrete collection tank to hold water but these are not well placed for additional field irrigation.

Both village groups rely on natural spring water sourced several kilometres from the point of use. Water travels in small, flexible pipes across rough terrain to the tanks or to standpipes on which villagers rely. In the months from October until April water from the springs is reduced by up to 80% and in drought years can stop completely. Most winters the water supply is just sufficient for personal use---drinking, cooking and basic cleaning and livestock---but completely insufficient for any form of irrigation. Consequently little can be grown in the winter months and

nutrition levels drop well below WHO (World Health Organization) standards and sanitation issues lead to increased illness within the communities.

In addition, the pipework infrastructure was not robust enough and damage to pipes occured with great frequency. When water was abundant the pressure over long distances of small-bore piping broke seals between pipe-sections. Pipes were crushed or separated by rock falls and landslides in this highly mountainous area that was subject to seismic movement almost every day. With access to the pipeline extremely difficult repairing the system was often slow and hazardous. Villagers estimated that they suffered complete loss of water supply from pipe damage once every three weeks on average.

Proposed Solution

After reviewing the on-site situation and having in-depth discussions with the village representatives and residents, the proposed solution was to largely replace the existing pipework in areas most damaged, to provide better fixings of the pipe system either by tie-backs to stable rock faces or by submerging the pipes into the soil reducing exposure generally. By using stronger and more flexible pipe materials and manufacturer recommended jointing details between pipework sections, it was expected that the system could be made more durable and could deliver the maximum water volume to the villages.

In addition, the intent was to add water outlets to each household, giving greater distribution within the villages for domestic use and to add irrigation points and stored-water holding tanks that would increase the area of fields that could be irrigated year round, and to allow for additional 'gardens' to be cultivated close to homes. Sprinkler irrigation points fed from stored water tanks and direct pipe connections would enormously improve field irrigation on a daily basis, allowing for a wider variety of crop growth which would in turn alleviate chronic malnutrition.

It was proposed that although the supply of water at source would not increase, the amount that reached the communities and which could be stored and utilized by them would increase over 100%.

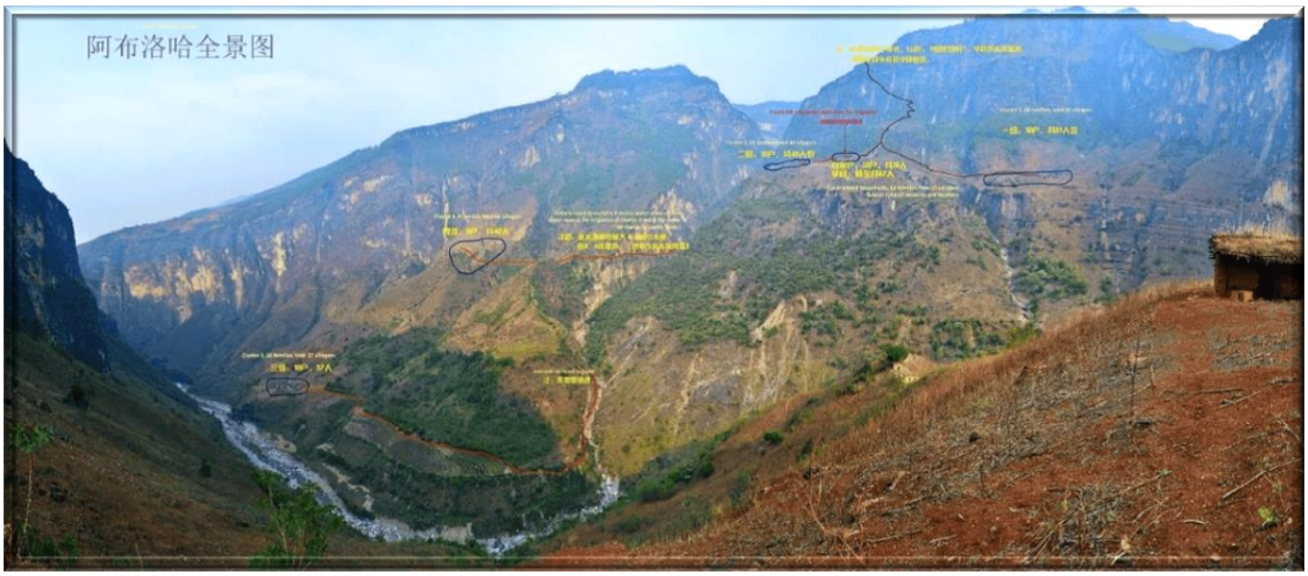
It was proposed that the intended works would provide the following improvements:

- Provide drinking water directly to all households;
- Provide sufficient water for livestock and allow for livestock increase in future;
- To provide direct and stored water to existing and new fields;
- To provide water storage against future drought conditions;
- To provide sprinkler irrigation systems to better distribute irrigation to existing and to extended fields;
- Increase total irrigated paddy area to 5 hectares in Butuo with potential to harvest two crops per year;
- To enable a 3X expansion of community vegetable growing, and to enable individual household vegetable gardens for child nutrition improvement;
- Add irrigation to 7 hectares of existing farmland in Butuo to increase yield;
- Develop and spot-irrigate a further 9 hectares in Butuo of currently dry, unused land to grow fruit and walnut trees for nutrition improvement and for trade.

Community Involvement

The Leprosy Project team did not believe in simply providing a complete and alien solution to a local problem. TPL has spent considerable time with the villagers in surveying the existing water supply points and distribution systems. TPL held community meetings to understand their concerns and to gather local knowledge. Together with them TPL have developed a realistic and affordable solution that includes significant community involvement.

The proposals for funding were entirely for materials, technical support and transportation. It was intended and agreed with the communities that all labour to install the new systems would be provided by the communities themselves. Given the relatively small size of the communities and their obligations through the year for basic subsistence, this was a significant responsibility to place onto them. They have without exception, however, helped to develop and have agreed to the proposals noted in this report. They recognized that they could achieve these ends on their own but that they also have a responsibility to build success.



Abuluoha --- A panoramic view of the project site

Rotary's Helping Hands

The Butuo Water Project proposal was brought to the attention of the Rotary Club of Hong Kong South. Fund raising appeal was then organized:

Host Club: The Rotary Club of Hong Kong South (香港南區扶輪社), Hong Kong SAR, China

International funding contributors:

(1) The Rotary Foundation of Rotary International
(2) Rotary Club of Bicester, England
(3) Rotary Club di Todi, Italy
(4) Rotary Club of Washington, USA
(5) Rotary Club of Willowdale, Canada
(6) Rotary Club of Happy Valley (快活谷扶輪社), Hong Kong SAR, China

(7) Rotary Club of Quarry Bay (鰂魚涌扶輪社), Hong Kong SAR, China
(8) Rotary Club of Shouson Hill (壽臣山扶輪社), Hong Kong SAR, China
(9) Rotary District 3450 (Hong Kong/Macao/Mongolia)
(10) Rotary District 3520 (Taipei, Taiwan)
(11) Rotary District 5040 (British Columbia, Canada)
Executive Unit: The Leprosy Project Limited (steering by Rotarians)

Project Implementation

Summary

It took TPL 9 months to survey the landscape of the villages and design the layout for the water tanks and pipes. The final design and plan of the Butuo Water Project (BWP) was confirmed in November 2015. In December, TPL staff members and the villagers began the first stage of work, clearing obstacles along the path where the water pipes would be laid. The project was aimed to be completed by October 2016.

The total estimated cost for the BWP was RMB624,324. The Global Grant from the Rotary Foundation was US$ 99,979. Due to the depreciation of the Chinese Yuan in 2015, TPL was able to remit a total of RMB644,497 resulting in a small surplus that would be used for the maintenance of the pipes.

The entire project involved more than 2,000 work trips by the villagers. Critical to the long-term success of the BWP was the 'participatory approach' which required the villagers to be involved in the planning of the project as well as providing the labour. Eleven GRP sectional water storage tanks with concrete platforms and 5 concrete sediment tanks were built; 19,360 meters of PE water pipes in sizes between 20mm and 160mm were laid.

More than 80% of the farm land in the villages are now covered by the new water system, totaling approximately 700mu. Two hundred sixty (260) villagers from the 67 households, the five-guaranteed households, the village school, and the clinic are connected to new water taps. This is the largest water project that The Leprosy Project Limited has ever implemented.

Conditions at the construction site

Access to the village is via steep rocky paths. The delivery of the water pipes, panels for the water tanks and the other heavy equipment to the site was difficult and dangerous. Heavy pipes requiring more than 10 truckloads were off loaded at the top of the cliff above the village. Part of the construction involved laying pipes from the water source down a cliff side with a 100 meter drop, followed by anchoring winding pipes 800 meters down the mountain side. All the pipes and equipment had to be carried by the villagers on their backs.

Beneficiaries

All villagers from the 4 clusters of Abuluoha Village (Butuo) benefited from the BWP which now provides a supply of water for drinking, irrigation and livestock year around.

Technical involvement

GRP Sectional Tanks were chosen for the BWP because they are durable, flexible and they come in panels that can be assembled on site. With these tanks TLP was able to install the size of tank

needed in each location. There were, however, many challenges in delivering the panels to the sites. With instruction and guidance from the tank supplier's technician, the villagers learned to assemble the tanks themselves. This is important for the future maintenance of the tanks.

Water pipe connection and installation:

The supplier of the water pipes also trained and advised the villagers on how to weld the pipes together. The villagers often worked in dangerous terrain, sometimes hanging from the cliff to connect the pipes. All work was approved by a qualified engineer sent by the supplier.

Water pressure and sediment filter system:

Because of the 800 meter vertical drop from the water source to Cluster 2, it was crucial to control the pressure of the water coming from the top of the mountain. The water pipes were connected with pressure valves and several tanks were constructed control the water pressure and prevent the pipes from breaking. These tanks were also used as sedimentation tanks.

Drip irrigation system:

Drip irrigation was a new concept introduced to the villagers by a TLP board member who is an agricultural expert. Although some villagers were initially skeptical of the system, 3 sets of drip irrigation systems were installed in Clusters 1, 3, and at the school's vegetable field. The results were remarkable and the villagers were able to witness the effect of the system. They are now eager to install more of these systems in the coming months.

Input and beneficiaries of the Butuo Water Project

Total Investment: RMB624,324

GRP Sectional Water Tanks 11, Total storage of 198 Cubic Meter

160mm PE Pipes	980M
140mm PE Pipes	3,280M
110mm PE Pipes	2,800M
63mm PE Pipes	2,400M
32mm PE Pipes	2,400M
20mm PE Pipes	7,500M
Labour Input:	More than 2,000 work trips by villagers

Results and beneficiaries:

All 260 villagers from 67 village households, 5-guaranteed households, school and the clinic are covered with the water system.

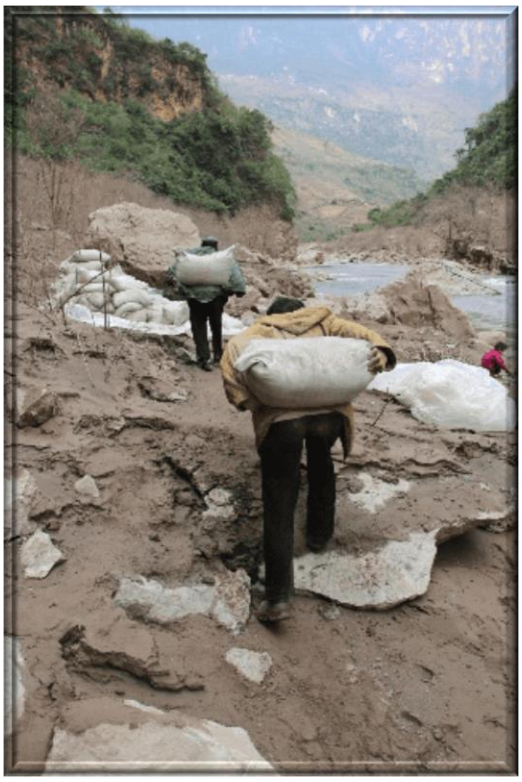
- 100% of households installed with water taps at home.
- Total 580mu (85%) of dry land can be irrigated.
- 50mu (100%) of paddy fields can be irrigated.
- 100% of family vegetable fields are covered.
- Overall more than 80% of farming land is covered with the new irrigation system.

Building the concrete platforms for eleven GRP sectional water tanks

The eleven concrete platforms were completed in January 2016. Since it was dry season in Abuluoha, the water level of the Xixi River was too low to allow villagers to use boats to carry the construction materials to the village. The villagers delivered all the materials by carrying them across the icy water of the Xixi River.

There was road construction throughout the southern part of Liangshan Prefecture, making it difficult to contract truck drivers to deliver materials to the village. As a result, there was an increase in the transportation costs.

Since boats could not be used to carry construction materials to the village, staff and villagers had to walk across three sections of the icy river, holding a rope for safety.



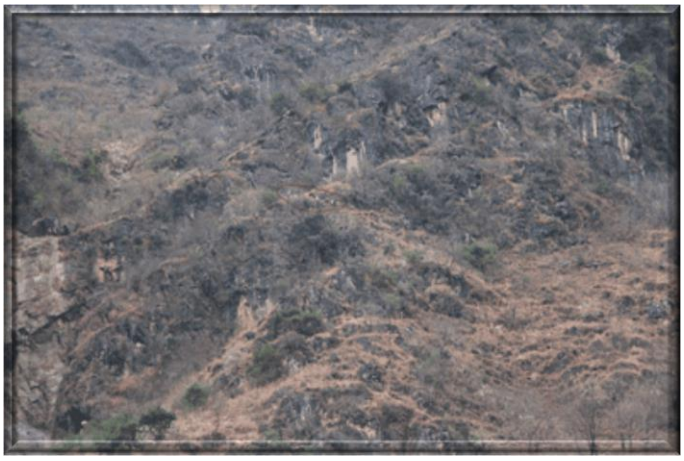
The villagers transported all the materials to the construction site on feet and shoulders.

Connection of the pipes from the water source to Clusters 1 and 2

The connection of the pipes from the water source above the cliffs in Clusters 1 and 2 commenced in February right after the Lunar New Year. Villagers overcame the vertical drop of 800 meters from the top of the cliff to the village. It was dangerous to work. The construction site was too far away from the village so it was impractical for villagers to commute to the site on a daily basis. They used an abandoned house as their base. They laid more than 3,000 meters of pipe to connect from the water source to Clusters 1 and 2.



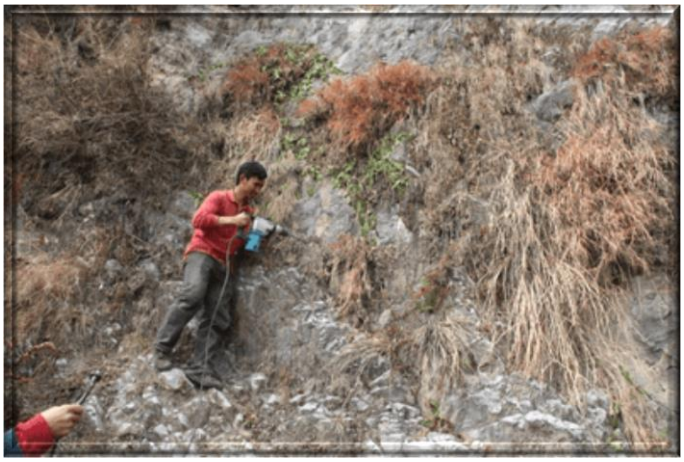

This heavy generator had to be carried to the various construction sites for welding.

Villagers delivering pipes and materials to water source for Clusters 1 and 2.


Villagers working on channel at the water source to collect water in the sediment tanks before entering the pipes.



Connecting the pipes and fixing the pipes onto the wall of the cliff.


This was where the villagers slept and ate their meals during the construction.

Installation of the main water pipes from the water source & sedimentation tanks to Clusters 3 and 4

A total of 4,800 meters of PE140 and PE160 water pipes, together with GRP sectional tanks were manually delivered to the villages in March. The distance was such that villagers could only get from the top of the mountain down to the basin of the valley where Clusters 3 and 4 are located two times a day. Due to the size and length of the pipes, they could not use horses or mules. Villagers carried all the pipes and panels on their backs.

Due to the lack of electricity and the primitive working conditions at the construction sites, it took 37 days to complete the installation of the water tanks, more than double the time estimated.

The connection of irrigation pipes in Clusters 3 and 4 started in April 2016

The delivery of the big water pipes to the construction sites began at the same time. These pipes were for the delivery of water from the ravine to the water tanks and from there to individual households and irrigated areas. The location of the water source is difficult to access and the big water pipes are very heavy making the installation work extremely difficult. Despite the challenges, the villagers finished the work in early July.


Villagers had to carry 160mm PE Pipes with the length of 4M manually up to the water source.

One of the water sources for Clusters 3 and 4.

Villagers connecting the water pipes.


Villagers had to work under extremely dangerous conditions.


Building of the sedimentation tank

GRP Sectional Water Tanks

When the GRP Sectional Water Tanks were first proposed by TLP water experts, the villagers had no idea what they were. Traditionally they have used concrete to build the tanks. This has many disadvantages with regard to durability and flexibility. As the tanks were constructed, villagers could see their advantages. They were enthusiastic about being able to assemble the tanks themselves.





Delivering water tank components to the village and moving them to the construction sites.

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Installation of the water tanks (10 pictures)


Drinking water pipes and irrigation system

Once all the tanks and pipes connected to the water sources were in place, drinking water pipes and irrigation pipes were then connected to every household, the school and the clinic. Three demo farms with drip irrigation systems have been set up for of home vegetable gardening with very positive results.




Connecting irrigation pipes and drip system for the demo farms


Vegetables grown with the new irrigation systems.


Connecting pipes from water tanks to every household.


Every home was installed with tap water for drinking and cleaning.

Future plans

Now that the first phase was completed, the work would continue as follows:

- Promotion of a drip irrigation systems so that all family vegetable gardens can be irrigated this way;
- Transformation of dry land into a paddy field. TLP expect to create a new 30-40mu paddy field over the next 3 three years;
- Installation of drip irrigation for 9,600 walnut trees planted by the government and 1,080 fruit trees including bananas, pomegranates, pears, peaches and others, provided by The Leprosy Project. These are currently irrigated by hand. The produce from the trees will improve the nutrition of the villagers as well as provide extra income.

Income & Expenditure Description

Income

Funds from Global Grants of the Rotary Foundation of Rotary International US$ 99,979

Funds disbursed to the Water Project in 3 installments RMB 644,497

Gain on Exchange RMB 19,632

There was a gain on the exchange rate due to the depreciation of the RMB. The surplus would be kept as reserve for the maintenance and management of the water system.

Expenditure

Insurance for volunteer labouers RMB 3,200

Trip Expenses RMB 25,624

Visits by project staff from Xichang and Hong Kong, Directors of TLP, Rotarians and Consultants, including air tickets, car rental, fuel, tolls, and accomodations.

11 GRP Sectional Water Tanks and Sedimentation tanks RMB 135,141

PE Water Pipes and Accessories RMB 370,939

20 mm to 160 mm PE Pipes, connectors, valves etc.

Construction Tools and Equipment RMB 29,828

Including safety belts, gloves, diesel power generators, welding machines, diesel, concrete mixer, reinforced steel, etc.

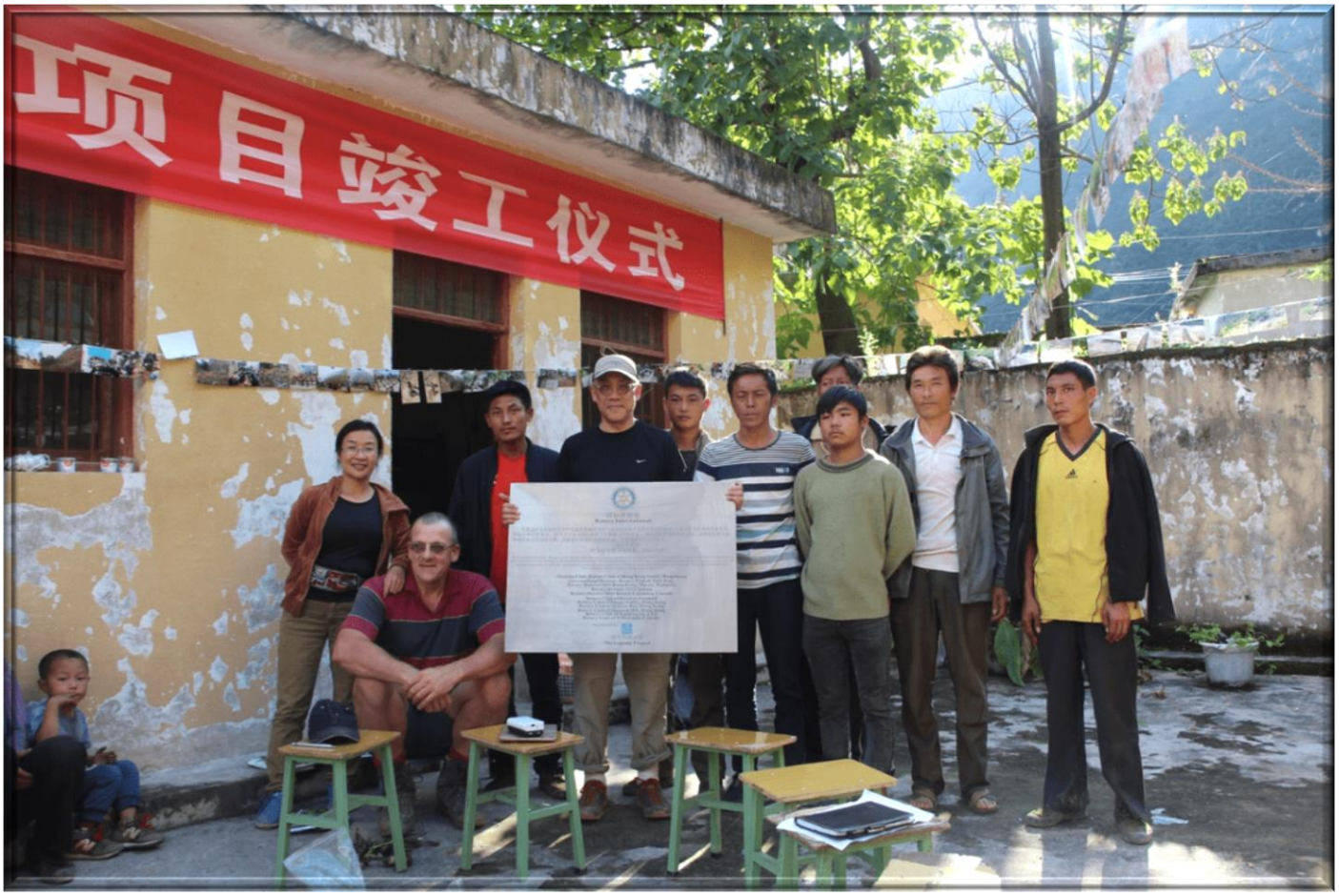
Delivery Cost RMB 40,060

Transportation of water pipes, tanks and other parts from factory to Xichang then to village

Technician Fees RMB 19,532

For water tank and water pipe technicians to stay in the village, including meals, transportation and accommodation

Total Expenses: RMB 624,324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