



REPORT ON LOTAN WATER SUPPLY

Herein is a photographic report on the Lotan water supply project.

Repairs were undertaken to the water inlet box, which is located a 2 hour hike up some quite steep hills:



Before & after photos. Lid correctly placed, white pipe joiner clamped over large hole that was allowing leaves etc to enter, and lots of holes drilled into the yellow pipe to allow water entry (but no leaves). The holes in the pipe had closed over due to mineral deposit build up.



*The in line filter cleaned out of much rubbish of leaves & twigs.
(The filter is contained under the large bronze nut indicated by the arrow)*

Several pipe breaks were repaired in the 2" galvanized water pipe. Typical issue:



Before and after shots.

There were seven breaks along the 2" pipe.



Typical issue: major leak - pipes not correctly aligned; joint broken; rubber innertube binding not effective.

Cutting or repairing the pipe threads with a large thread cutter:



Hard work, but they worked well together. Syska supervising.

Following the initial repairs, the large water tank was inspected – but no water was flowing in. So, we inspected back along a separate track for the 1 ½" pipe for about 1.5km, and 8 more breaks were located and repaired.

Next day, a further 11 breaks were repaired.



Failed barrel union. All old union components removed, pipe threads repaired, new fittings and pipe installed.



Near-vertical section of hill, pipes not correctly aligned; joint broken, pipes slid apart.



No wonder this joint broke, with the angle of the pipes and hence the strain on the joint.



A joint repaired and supported.



The initial work team in the hills.

Water now flowing into the big tank! But ...



This is the exit pipe network from big tank. Note two of the gate valve tap-heads are broken.

We hoped to use the tap-head from the new gate valves (visible on the ground), but the tap-head sizes were different. We ended up scavenging one tap-head from an unused section of the big tank, and Rino took the other tap-head to Maliana and had it bronze welded



Water pouring out of gate valve with broken tap-head.



Attempting to install the welded tap-head. Water shooting out of the gate valve – proof the big tank was filling.



Welded tap-head installed – no leaks!



*Supply pipe from big tank located and opened at barrel union (joiner).
Note the degree of dirt coming from the pipe.*



Very low flow coming from the pipe further towards village, due to scale and build up in pipe. Intermediate barrel unions could not be accessed and/or opened due to the depth on one, and some 4 tonnes of gravel over another.

There was a very low flow from the existing 1 ½" gal pipe, so the decision was made to run new 50mm poly pipe (pipe and fittings were already held at Belola container) from near the large tank to the village, and new 32mm pipe (pipe purchased; most fittings held) run through the village to the aerial ropeway and further through the village.

Location for the aerial ropeway was chosen, and agreed with the Chefé.



Support structure on the eastern bank raised and inserted into holes ready for concreting. (Legs are 100mm diameter x 6m long steel pipes.) Steel wire rope ready-run through top pulley.



The ropeway erected, with poly pipe attached below it. 5m (+) above river bed.



The poly pipe suspended below the steel wire rope.



The western bank anchorage.

*The reflective tape was applied as the anchorage protruded into the little-used "roadway".
Rocks also placed around the anchorage to keep vehicles away.*



Old pipe on western bank – exposed and torn apart by flooded river. This was the only section found in the 600m from the aerial ropeway! (Red ovals show ends of the pipe)

This required us to install 600m of new 32mm poly pipe from the aerial ropeway to the first section we could locate of the old pipe.



32mm poly pipe encased in a gal pipe for strength, and suspended well above a creek on the western bank.



First tap installed in the village. We had not even finished installing it, and it was already being used. Happy villagers! Mario showing the workers how to install the fittings.



We had a "handover" ceremony under the sacred banyan tree in the village. The chefé and I both spoke via Rino. The chefé presented me with a lovely "tai". We then had lunch provided by the village.



I presented the chefé with two pipe wrenches. I said we had provided the materials, and his people had done the work repairing the pipes and installing new pipes and taps. And now the village had to maintain the system – so we were giving him the tools to help the village maintain it all.

Financials:

The budget for the Lotan project was \$US 4,386, which included the Contingency sum.

Actual expenditure was \$US 4,276.

Some of the unexpected works included:

- 19 breaks in the gal pipe from the spring to the large tank. This took three days to locate & repair all the breaks, plus the materials. (Length of time taken was due to the distances and steep hills involved.) Each break required 2 poly fittings and at times 2 gal fittings to be installed on the gal pipe ends, plus the section of poly pipe. Additionally, most breaks required the ends of the gal pipe to have the thread re-cut, or at least repaired, with a pipe threader (which was quite hard on the 2" gal pipe with a manual pipe threader).
- Initial connection to the existing pipe on the western bank was located approx. 600m downstream – due to the significant length of old pipe washed away during floods. New 32mm pipe & fittings were purchased

- For a new pipe connection to the group of chefe's houses on eastern bank, new 20mm pipe & fittings were purchased
- Difficulty (and time) in locating, excavating for, and opening buried barrel joints along dual pipes from large tank – to flush out dirt, debris and lime scale in the gal pipes.
- One rusted pipe broke when we tried to open it, and needed a 6m section of 50mm poly pipe plus fittings, which were sourced from B5CC.
- Very low flow from the existing 1 ½" gal pipe was noted, so the decision was made to run 50mm poly pipe (pipe and fittings already held at Belola container) from near the large tank to the village, and new 32mm pipe (pipe purchased; most fittings held) through village to aerial ropeway.

Installed Works:



Legend of installed works:

Central section of village marked by yellow pin at centre left of photo.

Blue circle - big tank

Yellow – new 50mm poly pipe installed, due to mineral build up in the old gal pipe preventing effective water flow.

Blue – new 32mm poly pipe to connect from 50mm pipe to small old water tank (which will supply west Lotan)(total approx. 900m).

Pale blue triangles – approx. location of the 11 stand-pipes and taps installed through the village.

Red – aerial ropeway to carry 32mm poly pipe over river (approx. 64m long)

White – small 20mm line to chefé's area (approx. 300m long)

Black circle – small tank

North point – bottom right of photo

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