Himalayan Project

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9. February 2014

For Junbesi Water and Sewage Network Committee!

Now I am ready to take the initial steps for this water and sewage project. Therefore I am now opening up for your further and strong activities and decisions in Junbesi. I will not take the next step before you have taken the first step as described here below.

- You shall start a series of meetings leading to clear and unified decisions.
- You shall make minute from each meeting mentioning all agreements, but also all disagreements, with mentioning the names of those agreeing and disagreeing.
- It is important that major stakeholders shall take part and agree in all the decisions. Most important are Serlo Gompa and Junbesi School. But also all the hotels are important. And also Zhung Gompa needs to involve even their mass meetings are rare.
- You shall read through carefully this Project Proposal to give feed-back to Himalayan Project on the very content of the writing and on the project as a whole.
- Himalayan Project will on the basis of your comments produce a revised Project Proposal with which we will go to experts and probable contractors and donors.
- You shall start preparing the initial draft of "Rules and Regulations of Junbesi Water and Sewage Network" as described in this Project Proposal.

When we have seen you taking the above mentioned steps we will move forward with the project. But don't delay the process, because we are not ready to stay alert forever. If you want this project we will have to walk together. When you take one step, we will take the next, and then we expect you to take the following … and so on. But standing still on the spot will terminate my patience and my participation of the project.

I believe that this project is very important for Junbesi and I hope that you have the same belief. If a significant part of the people of Junbesi doesn't think it is so important, then please inform me so I can stop my work before embarrassing myself on approaching big companies and big donors. And especially Serlo Gompa and the Junbesi School have to show, that they find it very important for them to run this project.

I am looking very much forward to have your reactions and progressive decisions.

Yours Papa Kurt Lomborg

Project Manager of Himalayan Project

Himalayan Project

A Nepali-Danish NGO dealing with Development Aid in Nepal

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Project Proposal
Junbesi Water, Sewage and Fertilizer Project
February 2014
by Kurt Lomborg

Junbesi Village is a very special, beautiful and peaceful place as it is situated there in Junbesi Valley, Beni VDC, Solukhumbu District, North-Eastern part of Nepal close to Mount Everest and just below Mount Numbur close to 7.000 m high.

Junbesi Valley was settled by the Sharwa people, who immigrated from Kham in Tibet into the Northern part of Nepal in the 17. century and probably settled in Upper Solu in the 18. century. They are the dominant inhabitants of the valley under the names of Sherpa and Lama. They are originally businesspeople and cattle-farmers but nowadays mainly occupied with tourism and agriculture. In many households they are supported in the daily work by people of Bishwakarma caste, who gradually settled in the valley when the Sherpa came in need of land workers, blacksmiths and manure handling. There are several religious important places in the valley following the Nyingmapa tradition of the Tibetan Buddhism. Inside Junbesi village is Zhung Gompa where several important religious festivals take place, especially the Dhumje festival in spring where many hundred people are gathering for several days. Above the village is the old Tegangdo

Gompa where regular local ceremonies are celebrated. And further up is Serlo Gompa situated. During the last decades it has developed into a recognized convent school with 75-80 monk students and 7-8 teachers and staff. Inside the village is the local central school receiving 220 students from all the primary schools in the valley and having 15 teachers. It was built by late Sir Edmund Hillary half a century ago.

Junbesi is a tourism centre, as the old access way to Khumbu and Mount Everest is going through the village giving employment to a half hundred persons in nine hotels and three minor lodges. Nowadays this business is decreasing as more and more tourists are utilizing the airborne access to Lhukla and Phaplu Airstrip. The latter is also the easy access to Junbesi if visitors wish to avoid the 4-5 days bus and walk in from west.

Besides these public places there are 23 private homes in the very village and nearby surroundings, inhabited by 75-80 persons and/or by 24 teachers and health staff who live there for rent. In between Junbesi and Serlo Gompa there are one lodge, a Police Station, a Porter Lodge without service and 3 private homes.

Out of direct interest in this project proposal, but anyhow of indirect interest is the Tibetan monastery, Tubten Choling Gompa, up the valley inhabited by 800 monks and nuns. And 4 hours down the valley is the Phaplu Airstrip with almost daily flight for Kathmandu, some hotels and Phaplu Hospital which can provide basic service. One hour further down is the district headquarter and market town of Salleri.

A road is now under construction. It has already reached Junbesi and is now extending up the valley for Tubten Choling. It is still not to be used for normal vehicles, but it is a matter of time. At the moment construction materials and machines can reach the village.

Due to the relative wealth of the village and due to the internal competition and dominance among the hotels, there are difficulties among the inhabitants to organize and unite about new developments. Furthermore the village is quite spoilt by well-intentioned donors, who feel so very comfortable in this amazing place, and leaves money for various projects, so the villagers doesn't need to work hard for the donations. They can just wait for the next. And finally there has been a tendency among the comfortable classes to migrate first for Kathmandu and when possible abroad. There is a tendency to cut the nose of those who show it off.

Domestic water

The main domestic water source of Junbesi is the Menjung Khola in the gorge north of the village. It carries water all year. In the rainy season it is a rumbling torrent, but in the dry season of the spring it is just a small stream. A little up the khola a small and simple dam is build, which regularly is ruined during the rainy season. From there only one main tube is draining the collected water. The inlet of the tube is regularly, daily in the rainy season, blocked by leaves, which has to be removed by hand. This regularly creates disputes, who to do. The water from the main tube is divided for the households via a number of drums, which is also decreasing the water pressure. In many households they just let the water run all time, mostly due to malfunction of the tap, which regularly is chosen as cheapest equipment. Proper equipment is not readily available in the local market in Salleri. Of this reason some households in the lower end of the line is regularly going dry during the dry season leading to further disputes. Animals, especially yak and cows, are grazing above the source even up to very high altitude. Herders and people with errands in the pastures are using the stream for their defecation and cleaning afterwards. That is probably why diarrhoea is common in the village, and in some cases it is quite severe and some are difficult to treat. Four teachers and some students have recently had jaundice.

Some few households (3-4) have water from own clean source on their own land above the village from the very small streams running from small springs.

At a place called Porache, 1-2 km away, there is said to be plenty of clean water, and a little higher is a fine spring.

Water discharge and sewage

Only 5-6 households still use the old-time human waste management on open field, which is actually rarely on full open field, but rather around the same quite polluted spot.

Around 20 households have the simple compost latrine where human waste is mixed with straw and leaves and finally dug out and distributed over the latrine owner's fields.

3-4 four households have functioning septic tank, among them 1-2 hotels. But some claim to have septic tanks, but overflow shows that the tanks are too small or they are full. This is especially the case with some hotels.

Most hotels have flushing toilets because of the comfort demanded by tourists. And in most cases the toilets are flushing into the small stream which is running through the village more or less covered with stone slates changing it into a regular sewer. In some cases this stream also receives the overflow from septic tanks or basins. This is the case with for instance some of the toilets of the school, while the rest of the school toilets are delivering directly for the river. It also happens when many people are gathered for the ceremonies in the monasteries. During the water rich periods of the year this doesn't give noticeable inconveniences, but during the dry season the waste is accumulating in this more or less open sewer giving a foul smell all over the village, which is worsening year by year. Especially during the spring tourist season it is

giving this beautiful village a dramatic set-back. But even in the rainy season it goes wrong when children, students and others throw plastic, bottles, clothes, shoes or others which end up in the channel and regularly blocking it. Or some use stones, straw, paper, pages of copybook or newspaper to clean themselves after defecation and this also ends up somewhere as a blockage.

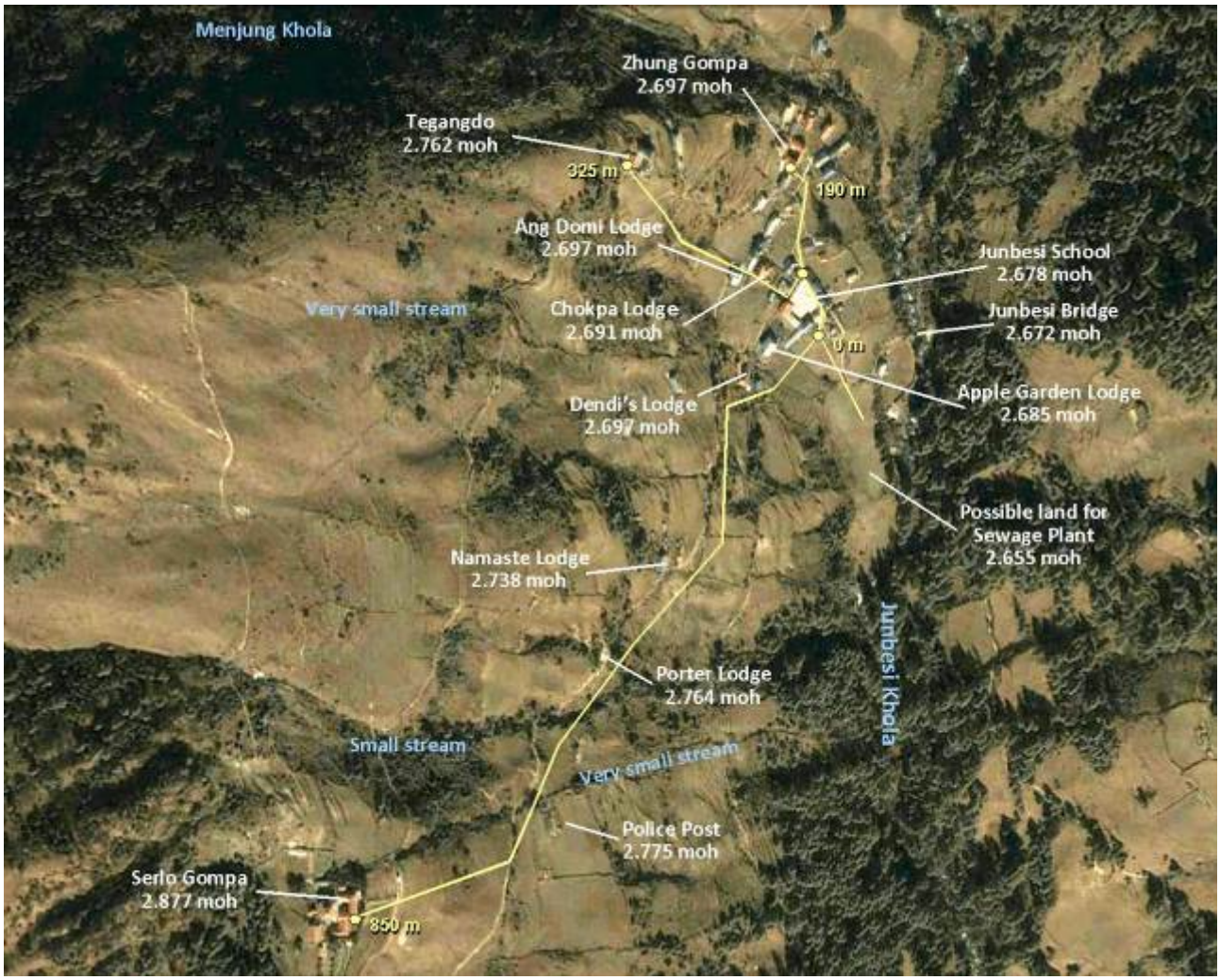
The convent school at Serlo Gompa is increasing the number of students and their waste problems are increasing with it. They are dealing with the problem, but again and again their efforts are not sufficient, so they are looking for an efficient and long lasting solution.

The religious ceremonies inside the village are in some cases changing into a disgusting obstacle jump between smelly waste heaps.

Finally a great portion of the waste runs untreated into Junbesi Khola. One generation ago the water of this river was directly drinkable and swimmable, but nowadays the locals regard the river as disgusting and deeply polluted. As later mentioned, the waste is not only from Junbesi.

Fertilizer

Only the before mentioned field defecators and the owners of compost latrines are utilizing the human waste products as fertilizer. No one will probably ever touch the septic tanks even if they are left to dry. The overflowing tanks are anyhow fertilizing some soil, but this is rather over-fertilized and not in productive use. And the sewer channel is only fertilizing the river, which finally end up in the previous brown Ganges River in India, which is now changing slowly into green. It is easy to see which fields are owned by compost people and which are owned by sewer people. The fields of the last are now changing into light clay colour.



SOLUTION

To protect inhabitants and visitors (tourists) against diseases and to secure proper distribution of clean water to all households there is a need to establish a protected source. Protected from any faecal contamination and from detritus blocking the tubes. There should be more than one primary tube or a proper size collection tank to secure stable delivery of water to all households.

In addition to domestic water supply there should be set up Emergency Water Tanks several places in the village for fire extinction. There are several old inestimable historical buildings in and around Junbesi. Especially the two old gompas. An outbreak of fire would be a cultural and personal disaster. Junbesi has a very basic Fire Brigade which would be much more in position if they had something to work with.

There is an increasing need of regulating the discharge of toilet waste and uncontrolled surface pollution of human faeces. Serlo Gompa could develop their own sewage system, but the village needs a common solution, which Serlo should also connect to. It has to be a system based on individual lavatory pans with outlet trap where unwanted contaminants can be caught and removed backwards. Especially this shall be sharply considered at the school, where special bowls could be in demand as well as regular information to the students on how to utilize the toilet. Especially to those students coming from the surrounding area. There should be a compulsory duty for all villagers and institutions to connect to the sewage system. Maybe those who are using compost latrine could be omitted as their waste solution is actual almost natural but at least ideal.

From the lavatories the waste shall be led by dug down, proper quality, closed and safely joined plastic pipes. Digging down is a problem, as bedrock and huge stones will be in the way. At some places it can be avoided, but in other places they will reveal in any depth under the surface. At the altitude of Junbesi at 2.600-2.762 meter above sea level and Serlo at 2.977 meter, there can be snowfall and heavy frost during winter, but rarely for long time. Usually the temperature will crawl up to 5-10^{o} during daytime even though it was minus 15^{o} at nighttime. Hard frozen soil is rare even just 10-20 cm below surface, as sun is having great power during daytime. The dropping slope is high. From Serlo to Junbesi 20-25%. From Tegangdo to Junbesi the same. From Zhung Gompa to the mid village around 10%. And the same inside the village. How far there shall be a continuous flow of water from the starting points of the pipes to prevent blocking by drying waste, shall be up to an evaluation by experts.

Below the village and just above the river there is a very flat land about ½-1 hectare with a deviation of few meters which can be regulated by relatively simple digging. Here two or more basins can be established where the waste and silt can be changed into useable fertilizer.

The fertilizer is in high demand by land owners. Usually Sherpa doesn't like to touch faecal manure and especially if it produced by humans. But Bishwakarma doesn't mind as long as it doesn't smell and appear like faeces. Manure has a price in Junbesi. One basket, which is around 100-150 litre, cost 50 rupees including transportation, but not for spreading. Probably human fertilizer could be stronger and therefore sold at higher prices. 75-100 Rupees is suggested. The daily wages of landworkers in Junbesi is 350 to 500 Rupees. So handling of manure could be a considerable income source for those who want to do the job.

How far surface water should have its own treatment or just follow the old streams to the river should be considered. If all faeces are regulated the surface are not that contaminated with others than natural surface detritus. So probably the cost-benefit will not indicate a regulated rain water discharge.

This solution can with one step re-establish Junbesi as the paradise on earth, which it was before.

- Clean and sufficient potable water.
- Clean and fresh environment.
- Less infectious diseases.

- An almost eliminated pollution of the main river from this village.
- Recycling by producing manure.
- Creating direct income to those handling the manure.
- Creating indirect income by fertilizing the soil.
- Stronger organization of the Fire Brigade.
- Stronger organization and unity in the whole village.

Population data

The total population of the very village of Junbesi is 150 to 190 of who 25 is going to school in Junbesi. Humans produce roughly 500 litres of urine/year (1⅓ litre/day) and a Nepali vegetarian produces around 100 kg faeces/year (⅓ kg/day), which corresponds 4 kg of nitrogen, 1 kg of potassium and ½ kg of phosphorous. 70% of the nutrients are excreted by the urine fraction. Some of this excretion is delivered outside the village during the day, and some tourists excrete less, so the results below are probably a little high end.

Junbesi Village:

	L Urine	Kg Faeces
Hotels: 8 big or bigger and 3 small:		
40-45 grown up persons living there all year	20.000 l	4.000 kg
Tourists: 25% staying 2 days and 5% staying 3 days or more		
High seasons 2000 persons per year	4.000 l	1.000 kg
Low seasons 250 day-persons/year	500 l	150 kg
Nepali tourist guides and porters: 25% staying 2 days and 5% staying 3 days or more		
High seasons 2500 persons per year (if they use lavatory)	5.000 l	1.200 kg
Low seasons 250 persons per year (if they use lavatory)	500 l	150 kg
Nepali guests: 50% stay 2 days or more and 10% stay for 1 week		
1000 persons in a year	3.500 l	1.000 kg
People working with projects staying 1-2 days: 40-50 persons/year	100 l	25 kg
23 Private homes: some houses empty 75-80 persons living all year	37.000 l	7.500 kg
Junbesi School: 220 students and 15 teachers (½ day 6 days a week)	50.000 l	10.000 kg
Teachers and Health Staff for rent: 24 persons 75% of the year (½ day)	5.000 l	1.000 kg
Monks: 20-25 on normal days and 50 on Saturday passing by (½ day)	3.500 l	700 kg
Zhung Gompa: Dumji 1500 people 2-3(-5) days	6.000 l	1.200 kg
3-4 smaller ceremonies with 7-8 persons 1 day	40 l	10 kg
Marriage once a year with 15-20 persons in 2-3 days	80 l	20 kg
Funeral 1-2 times a year with 100-150 people for 2-3 days	300 l	75 kg
Serlo to Junbesi:		
Serlo Gompa: 75-80 students plus 7-8 staff almost all time	40.000 l	8.000 kg
every second year ceremony for 10-15 people 1-2 days	15 l	5 kg
Namaste Lodge: 5 persons all year and 350 tourists per year	3.500 l	700 kg
Police Station: 7 people (½ day)	1.500 l	350 kg
4 houses with 8 people	3.000 l	500 kg
In TOTAL:	**180.000 l**	**36.000 kg**

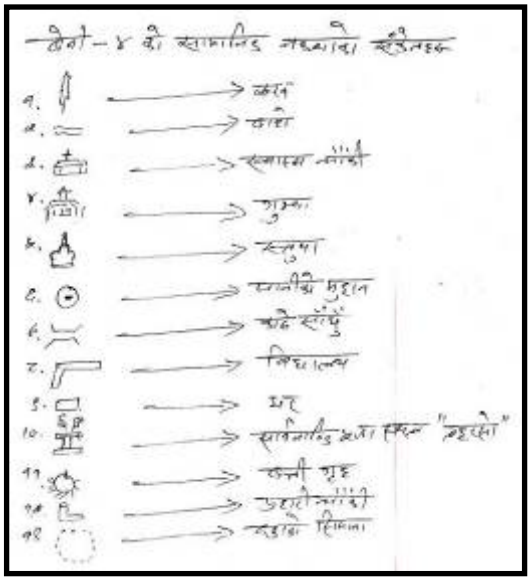
which corresponds 1.500 kg nitrogen, 360 kg potassium and 175 kg phosphorus.

Local support

The initiator of this project is Pasang Lama, who is running Ang Chokpa Lodge on rent. He is the son of the great Lama Tenzing of Junbesi, and he is an honest and sincere man, who is very concerned about the moral and practical function of his town. He is ready to remain the head of committee work and decision processes, but he is also ready to hand over the job for anybody else that could be elected or selected. But he is anyhow the immediate anchor of the project.

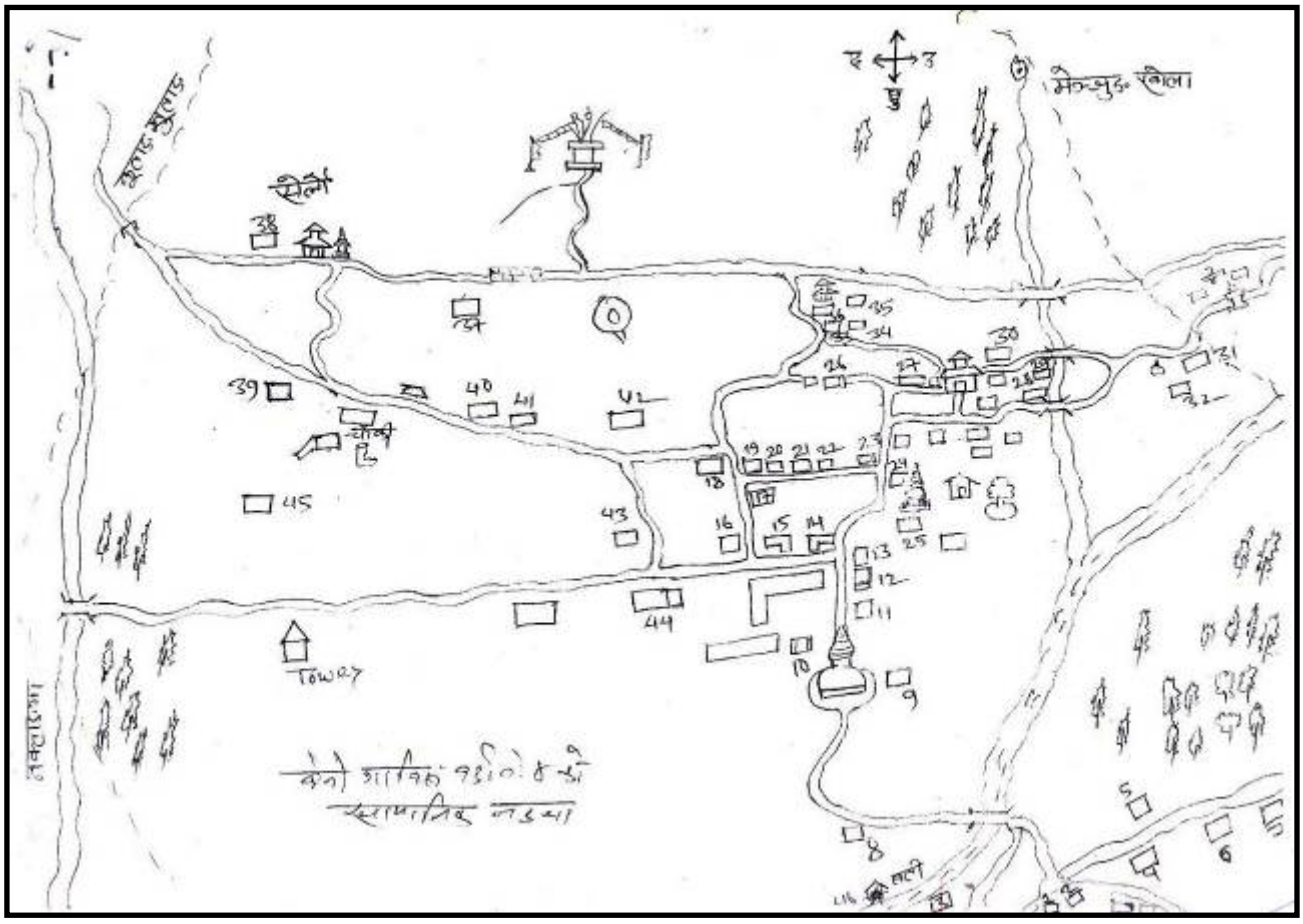
At a preliminary meeting in Junbesi in 2012 about the sewage project 39 persons attended the meeting. They were asked three questions. All replied YES when they were asked how far this project is relevant or not, and how far they were interested in the project. Asked how far they would make use of the fertilizer produced by the project, 32 replied YES and 7 said NO. Some of the people attending the meeting have no land, but there was also a few who said no although they have land, but it isn't specified why. And finally when asked how far they would be member of the sewage system and contribute for it coming into existence, 27 said YES while 12 said NO. A few attended the meeting even they live outside the affected area. One was very old and couldn't decide. Some have compost latrine and don't feel the need to connect. Some are too poor to dare involving further. And finally a few was just in opposition.

It depends on the design of the pipeline, how complicated it is to connect later on, how far all households shall be forced to connect from the beginning or how far they can wait. It is also a decision of the village how far they will accept some staying outside the solidarity or not. It is also important to have the consent from major institutions like Serlo Gompa and Junbesi School. And Zhung Gompa shall be ready to establish sufficient facilities even they will only be rarely in use.



When people give their approval for the project, they probably only imagine the pipeline. They can't imagine the basins for changing excretes into fertilizer, as this kind of facilities doesn't exist in Nepal.

It was not asked specifically what people would contribute when asked that question. Most people probably imagined supporting with money, but no one



expressed how much. But some expressed that they would contribute with labour, but not specifically how far it was volunteer or for payment. Some would give permission to dig down the pipe in their land. In the money matter it will be very difficult to fix an amount to pay, as some really don't have money worth counting, while others are quite rich. But there will be a dispute about equal share against paying according to wealth. Some of the wealthy even don't live in Junbesi, but are giving their hotel in others hand for rent.

The people are reluctant to ask religious institutions for support, but Serlo Gompa is running well having income from many sources, so substantial economic support from this side must be expected. The school is having limited funds, but it is regularly having donations from occasional and regular visitors, so it should be possible to apply for support for this necessary project too. Furthermore the school could collect support from the parents of students coming from the catchment area. It is estimated that only 6-7 households (hotels) can pay 10.000 Rs or more, but probably no one will pay 50.000 Rs (100 Rs/US$ ≈ 17,5 Rs/DKR). But many can contribute with volunteer labour.

Local Discussion

There can be no doubt that Junbesi need to solve the threefold problem with water supply, sewage management and natural fertilizer. And there can be no doubt that all three solutions will benefit all villagers and all users.

How far the fertilizer part of the project will be effective will depend on how far the treatment plant will come to work in a proper way, so the produced fertilizer will not appear and smell like faeces. If it will appear like compost it will definitely be utilized. Therefore we will need real experts to design this part of the project.

But there could be some problems in giving the people the right awareness about the project and its sustainability. Just giving water and sewer for free and without demands will lead to carelessness and disputes. There must be a strong sanitary committee, not only in the construction period, but even more important in the following running period, which can take care of the rules and regulations and the maintenance. There should be an employed to look after and act on the practical part. Therefore there need to be a yearly subscription fee from all members and users to pay for this salary and maintenance. There also have to be rules of compulsion which is forcing the whole society to become subscribers unless the reasons are clear and good, and with no option to leave this public network after admission. And that this subscription follows the property and not the person. Therefore there shall be clear and strong actions to be taken towards those who act against the society with asocial behaviour.

It shall be a demand that "Rules and Regulations of Junbesi Water and Sewage Network" shall be established before the project can start. And it shall be a demand that the inhabitants and owners of all properties, tenements and institutions of Junbesi shall pay their admission fee and subscription fee of the network before the project can start.

How far there shall be more individual substantial initial payments for the establishing of the network shall depend on the contractor undertaking the project. It will depend on how much external support there can be established, but also on an evaluation of how great the wish and demand of the villagers are. Everyone can say yes to something given for free, but only those who understand the real necessity of the project and its sustainability are ready to give their personal support.

If the Junbesi society wishes to have this project running, they shall be aware that the offer of supporting the project will not run for ever. The society has to unite and act in very near future. It is right now that the offer exists, and it will disappear again if not kept alive. Therefore one of the first steps shall be producing a draft of the rules and regulations to be given to Himalayan Project for our review and proposals.

General Discussion

Only few years back there were no problems like this in rural Nepal. All were defecating in the free on the fields or they had compost latrine. But with the urbanization development of more dense settlements it was no longer possible and more or less primitive sewer systems has developed like above mentioned. Further up the valley at Tubten Choling Gompa with 800 monks and nuns the system is disgusting. A huge common latrine is receiving the waste in a huge basin from where it is over floating down to the small stream and further down to Junbesi Khola. Down the valley in the district main town of Salleri there are some sewer systems in a covered stream in the street, but it is ending up in the small streams crossing the long single street lined town. The same is the case with the smaller town of Phaplu.

There are no proper solutions in rural Nepal to my knowledge, but it is very necessary to develop a new concept to solve the problem. And it is a growing and urgent need to find local solutions. It is also in the awareness of the local authorities that both the human and natural environment need a solution on the problem. The Government of Nepal has started implementing "Open Defecation Free Area Program" (ODF) all over Nepal where all households shall have a solution on human waste management so defecation in the free can be avoided. This is mainly solved by making individual septic tanks, but also simple compost latrines. Until now the development of optimized composting techniques has not spread in the hilly areas. Therefore the fields will now be deprived of huge quantities of natural fertilizer. And in the urban settlements this is even in a worse situation, as the solution even doesn't implement septic tanks.

The reason of choosing Junbesi for the pilot location for the "Water, Sewage and Fertilizer Project" is that Junbesi has a limited extension and population, but it is though big enough to give a proper functionality. Furthermore there are economic interests in creating a proper solution, which can promote the success of the project.

It can be expected that this pilot project can be run with the extensive support from Nepali authorities and from several INGOs operating in Nepal and dealing with water quality, disease control, hygiene, sanitation and environment. And it can furthermore be expected that even the follow-up projects in mentioned places can run with same support. Danida for instance has several programs which could cover this project. So for a company like Hedeselskabet going into this project, it can be both a business activity and a public charity act towards the involved societies and for Nepal as a whole. The project in Junbesi could be the schooling example for others to follow.

Himalayan Project Danmark and Himalayan Project Nepal can provide the local knowledge and supervision to the project in the initial phase, and we can provide the monitoring of the progress during the establishing phase, as well as we can revise and monitor the accounting and payments. After the completion of the construction we can provide supervision to the society at least for an initial period.

Completed in Kjeldbjerg, Danmark on 9. February 2014

by Kurt Lomborg
Project Manager of Himalayan Project Danmark