



TGUP Project Details

Large-scale Latrines Construction Project

Various Schools, Nyeri, Kenya



Shining Star Latrines Before



Shining Star Latrines After

Project Summary

The Global Uplift Project will build a set of five latrines for five schools in Kenya. Each set of latrines will have four stalls, two for boys and two for girls. A single stall will cost \$1,500, or \$6,000 for a set of four stalls. Thus, the cost for the 20 stalls of the entire project will be \$30,000. Construction will be carried out by TGUP's Kenya partner, the Kiini Sustainable Initiative (KISI). KISI has been building latrines for TGUP in Kenya since 2011. It has completed a total of 29 projects for TGUP including classrooms, latrines, playgrounds, and other essential educational infrastructure. The project will commence as soon as financing is secured. It will require approximately one month for each set of latrines, or an estimated six months from beginning to end.

Background

Latrines are not glamorous. They are not fashionable or exotic or chic. But they are as essential to safe social life as anything else in the world.

In the wild, people can poop in the bushes. It is diffuse and quickly decomposes into inert elements. In social settings, however, when the poop is both concentrated and constantly renewed, it doesn't have time to decompose. So, it builds up toxic bacteria including E.coli and others deadly pathogens. The results are cholera, dysentery, diphtheria and other ineradicable diseases that enervate entire communities.



Latrines also serve another important social function besides helping eliminate disease. They are the private place where menstruating women can change the sanitary supplies that allow them to manage their period so they can carry on a normal life, even during menstruation. Without such places, without such privacy, women cannot effectively manage their period, so do not venture out into public places, including schools.

This is uniquely insidious and damaging to females, especially those who are still of school age. If they cannot manage their periods—which requires the private places provided by latrines—they routinely miss a week of school a month. They inescapably fall behind boys in academic achievement. In many cases, they eventually drop out. That is the moment when they become second-class citizens, because they will forever after have less education than the boys. This is one of the reasons—just one, but an important one—that women in the developing world earn 40% of what men do.

Latrines are a very-low level technology with an extremely low cost per-person serviced per-year. They are essentially a deep hole in the ground into which the poop is deposited/excreted and contained against dissemination. TGUP's experience building hundreds of stalls of latrines, documented below, show that we can make a safe, private, sanitary latrine stall available to school students for around \$.30 (30 cents) per student per year. There may not be any other generally available technology that is equally cost-effective in making education possible for all students, regardless of race, regardless of gender.

Economic Models

Immediately below, is the highest-level economic model guiding this enterprise. It distills our experience with multiple similar projects undertaken in the past three years. It shows costs per stall for 3-, 4-, and 6-stall latrine sets. Assuming an expected life for the pit of 20 years, it shows that the average price per stall per student per year is \$.32 (32 cents). This is the starting basis for the entire process.



Summary of Recent Latrines Built by TGUP in Kenya

Location	# Students	# staff	Price	# stalls	Price/stall
Gikumbo	386	23	\$5,000	4 stalls and 1 urinal	\$1,250
Ngungu boys	141	12	\$5,000	4 stalls and 2 urinals	\$1,250
Ngungu girls	141	12	\$5,952	4 stalls	\$1,488
Ngungu staff	141	12	\$5,053	3 stalls	\$1,684
Shining Star	269	15	\$7,725	6 stalls	\$1,288
Total	1078			Average	\$1,392
Average	216			Price per stall per student	\$6.44
				Expected duration per pit in years	20
				Price per stall per student per year	\$0.32

We look in greater detail at how the costs are composed. Over the cases analyzed above, labor, which includes both excavation of the pit, and building the super-structure on top, comes out to about 68% of the total costs. The other components are broken out below.

Ngungu Girls' Latrines	Kenya Shillings (KSH)	US Dollars (\$)
Excavation 2 double units, 45 cu feet each	104,000	\$1,040
Ant Termite Poison 1 Litre	3,000	30
Ballast 10 tonnes	19,000	190
Quarry stones 300 cu ft	18,000	180
Sand 10 tonnes	22,000	220
Cement 40 bags @ 750ksh	30,000	300
Stones 450 cu ft	36,000	360
Timber 6*1 - 430ft @ 49ksh	21,070	210.7
15, D-10 ground bars @1060	15,900	159
Barbed wire Roll @5000	5,000	50
Timber 3*2 – 500ft @ 51ksh	25,500	255
Nails 15kg @ 250ksh	3750	38
Iron sheets 21 @ 3M each @ 900ksh	21,900	220
10 kgs Binding wires @300	3,000	30
Doors 4 @ 5765ksh	23,060	230.6
Paint	18,450	184.5
Transportation	28,000	280
Labor	95,700	1595
Plans, Permits, Inspection, misc	37,900	379
Totals	531,230	\$5,952

We use the set of latrines built at the Ngungu school in 2019 as the paradigm by which to estimate the costs for the present project. It is the most similar in nature (4 stalls) and reasonably close in time. Note that these four stalls cost more than the 4 stalls and 2 urinals

for the boys' latrines at the same school. That is because the boys' set were built 2 years earlier, thus reflecting the inflation occurring in labor and materials cost.

5 Latrines @ \$5,952 each	Kenya Shillings	US Dollars
Excavation 2 double units, 45 cu feet each	520,000	\$5,200
Ant Termite Poison 1 Litre	15,000	\$150
Ballast 10 tonnes	95,000	\$950
Quarry stones 300 cu ft	90,000	\$900
Sand 10 tonnes	110,000	\$1,100
Cement 40 bags @ 750ksh	150,000	\$1,500
Stones 450 cu ft	180,000	\$1,800
Timber 6*1 - 430ft @ 49ksh	105,350	\$1,054
15, D-10 ground bars @1060	79,500	\$795
Barbed wire Roll @5000	25,000	\$250
Timber 3*2 – 500ft @ 51ksh	127,500	\$1,275
Nails 15kg @ 250ksh	18,750	\$190
Iron sheets 21 @ 3M each @ 900ksh	109,500	\$1,100
10 kgs Binding wires @300	15,000	\$150
Doors 4 @ 5765ksh	115,300	\$1,153
Paint	92,250	\$923
Transportation	140,000	\$1,400
Labor	478,500	\$7,975
Plans, Permits, Inspection, misc	189,500	\$1,895
<u>Totals</u>	<u>2,656,150</u>	<u>\$29,759</u>

Commercial construction prices have continued to rise since 2019. But we are expecting that with 5 projects, we will secure economies of scale in both labor and materials, such that we can contain the costs per set of latrines to under \$1,500 per stall, or \$6,000 per installed set of latrines. This is the basis for the cost of the entire project being \$30,000.

Target location specifics

All of the latrines will be built at public schools in Nyeri or nearby Kirinyaga county. All of the schools are well known to KISI, and all of the schools' administrations have agreed to work with KISI in the completion of the project. All of the school communities are contributing to the costs of the project, mainly through the provision of in-kind labor.

Kihuyo Day Secondary School



Kihuyo Day Secondary School in Nyeri county has 10 staff and 170 students. The staff share a single latrine, which is almost saturated. There is desperate need for latrines for girls as well. The local population is made up of casual workers who find seasonal work at the Diocese of Nyeri. The school also needs another classroom, electricity, and water harvesting for feeding the school garden which is grown to feed the students.

Gaciongo Mixed Day Secondary School



Gaciongo Mixed Say Secondary School is located in Ngariama location, Kirinyaga East district, Kirinyaga county. The school has 10 teachers and 139 students. It has 5 classrooms which define the upper limit of its attendance population. With more facilities, it could greatly expand the number of students it handles. In addition to needing latrines it needs electricity, water harvesting and play equipment.

Kiandai Mixed Day Secondary School



Kiandai Mixed Day Secondary School is based in the Baraghwi location, Gichugu constituency, of Kirinyaga county. It has 10 teaching staff and 107 students; 53 boys and 54 girls. It has 4 classrooms that are expected to be insufficient when primary school students, numbering an additional 50 students over current levels, matriculate over coming years. The latrines are leaking and labeled a hazard by the county health authorities.

Mucagara Mixed Day Secondary School



Mucagara Mixed Day Secondary School is the largest school in the target population. It is in the Ngariama location, Kirinyaga East, in Kirinyaga country. Most of the families are squatters who do not own their own homes, and do not pay rent to any entity. It has 180 students and 23 teachers/staff. There are 9 classrooms. Latrines are separated between girls, boys, and teachers. New latrines would be devoted first to students, then to teachers. The school also needs electricity and water harvesting.

Kiangi Primary School



TGUP, in partnership with Kiini Sustainable Initiative, will build a block of latrines with 4 stalls exclusively for the girls at Kiangi Primary School in Mathira, Nyeri county. It currently has 13 teaching staff and 220 students. There are 8 classrooms but 5 have been condemned, so two grades are taught offsite.

Summary and Recommendation

We rate this a high-priority project based on the following factors:

- In all cases the existing facilities are inadequate, bordering on dangerous
- In all cases the new facilities will be utilized immediately
- New facilities will enable expansion of school populations for all schools
- \$.32 /student/year is extremely low cost to improve school attendance
- They will increase attendance by adolescent girls who skip school some weeks
- TGUP and KISI have extensive experience building latrines in the Nyeri area
- KISI has good relations with all of the school administrations
- All of the latrines meet local health department and national educational standards
- Building all of the units in a single project will enable economies of scale that cannot be realized by building the units one at a time