

MABATI BULB PILOT PROJECT EVALUATION: NOV. 2014

In January 2014, Give A Child Life launched the innovative Mabati Bulb project in the Kiandutu slum near Thika, Kenya (*Mabati is Swahili for iron sheet*).

With about 20,000 people, Kiandutu is a maze of rusted iron sheet and mud huts separated by fences made of sticks and cactus. Unemployment is high and diseases and infections are frequent.

Weekly incomes average around 1000 shillings (about \$10). Most people work as casual laborers, meaning that they take work wherever they can find it and are paid on a piecemeal basis. Many sell small foodstuffs, such as tomatoes, or other items like shoes imported from China. Or they sell hard boiled eggs or cups of hot coffee.

The poorest wash clothes. Many have trouble making rent payments, with the average family skipping two to three payments a year. Many families move at least once a year.

A third of the residents eat, on average, one meal a day. In a recent GCL survey of 95 residents, 92% reported that their children were hungry and 26% had lost at least one child under the age of five to a preventable disease such as pneumonia or diarrhea. About 20% had at least one family member with HIV/AIDS. Over a third of the adults never attended school.

Most families live in single small rooms, 10 x 10 or less. Over half have no window, only a door to let in light during the day. Fewer than 30% have electricity and even if a family does, many never turn on the lights because they can't afford the monthly bill. Imagine living in darkness all day and all night. Some families are so desperate for light, they make holes in the walls, then suffer from cold all winter.

Adapted from lights developed by Brazilian mechanic Alfredo Moser in 2002, Mabati Bulbs are an inexpensive way to light up poverty-level homes during the day. Made from recycled two-liter soda bottles filled with water and a little bleach, they are glued into a home's roof and bring in as much light as a 55-watt bulb...without costing a penny.



From January through October 2014, Give A Child Life installed approximately 260 Mabati Bulbs at 114 sites in Kiandutu. Bulbs were installed in more than 69 homes and five schools. The number installed per site ranged from 1 to 18, with an average of 2.3 per site.

SITE	NUMBER
Home	69
School	5
Office	1
Shop	1
GCL compound	1

Installations targeted the poorest families in Kiandutu, particularly those with children age 5 and under. The average family that received Mabati Bulbs had 2.1 children age six or under. Preschools were also prioritized, as were the homes of village elders and community health workers. GCL worked with the local government health center to identify families affected by tuberculosis who could benefit, as the head doctor said the lights would help reduce transmission rates within families. All together, 182 adults and 536 children, including 208 children under 5, benefited from the Mabati Bulbs.



Here are the needs addressed by Mabati Bulbs and the project objectives that can be achieved:

LIVING IN DARKNESS: NEEDS	LIVING WITH MABATI BULBS: PROJECT OBJECTIVES
Children can't see to read or study inside	Children's development is promoted because they can see to read and study; they can play with toys and see each other's faces inside.
Mothers can't see dirt, bugs, rats and other hazards	Houses are cleaner and children are sick less often. They have better school attendance.
No one can see hot cooking pots on the floor.	Falls and accidents are reduced because children and adults can see inside.
Germs flourish, especially tuberculosis.	Houses are healthier because UV (sun) light kills germs.
Mothers have trouble working inside their homes because they can't see; they are afraid to count their coins because they have to open the door.	Working is easier when a home has light inside.
Families sleep longer because they can't tell the difference between day and night.	It's easier for children to wake up and get ready for school.
Families get frustrated because they can't find things like clothes in the dark.	Children and parents are happier because it's easy to find things.



Before receiving the Bulbs, each family completed a pre survey. Families were lighting their homes with:

Light Source	Percent
Opening the door	94%
Opening a window	50%
Paraffin lamp	32%

A few families used flashlights or candles.

Once the Bulbs had been installed, GCL staff returned a month or so later to complete post survey. All of the pre/post changes were highly statistically significant ($p \leq .0001$).

During the day, how hard is it in the room to....

Recognize a face?	Pre Number	Pre Percent	Post Number	Post Percent
1 Easy			58	98%
2 Not hard	8	9%	1	2%
3 Hard	44	51%		
4 Very hard	34	40%		
Grand Total	86		59	
Average	3.3		1.0	

Find things?	Pre Number	Pre Percent	Post Number	Post Percent
1 Easy			58	98%
2 Not hard	10	12%	1	2%
3 Hard	42	51%		
4 Very hard	30	37%		
Grand Total	82		59	
Average	3.3		1.0	

Prepare food?	Pre Number	Pre Percent	Post Number	Post Percent
1 Easy			45	100%
2 Not hard	5	6%		
3 Hard	46	60%		
4 Very hard	27	34%		
Grand Total	78		45	
Average	3.2		1.0	

Clean?	Pre Number	Pre Percent	Post Number	Post Percent
1 Easy			57	98%
2 Not hard	7	8%	1	2%
3 Hard	47	55%		
4 Very hard	31	37%		
Grand Total	85		58	
Average	3.3		1.0	



How much of a problem are...

Burns from cooking pots?	Pre Number	Pre Percent	Post Number	Post Percent
1 No problem	4	6%	44	94%
2 Problem	48	70%	3	6%
3 Big problem	16	24%		
Grand Total	68		47	
Average	2.1		1.1	

Falls and other accidents	Pre Number	Pre Percent	Post Number	Post Percent
1 <i>No problem</i>	6	8%	54	96%
2 <i>Problem</i>	50	68%	2	4%
3 <i>Big problem</i>	18	24%		
Grand Total	74		56	
Average	2.1		1.0	

Finally, we asked people how happy they were before and after getting the light.

How happy are you?	Pre Number	Pre Percent	Post Number	Post Percent
1 <i>Low</i>	20	24%	0	
2 <i>Medium</i>	28	33%	1	2%
3 <i>High</i>	36	43%	54	98%
Grand Total	84		55	
Average	2.2		3.0	

When asked how having light during the day changed their lives, the most frequent responses were in order:

1. The house is clean. (26 responses)
2. It added light. (22)
3. Life is better, happier. (16)
4. We save money on the electric bill and kerosene. (15)
5. We can find things. (12)
6. Work is easier. (6)
7. We wake up earlier. (4)

When asked how the light changed their children's lives, responses were that the children:

1. Can study and do homework inside. (17 responses)
2. Can read inside. (14)
3. Are happier. (14)
4. Wake up earlier. (9)
5. Can find things. (8)

Other responses included that the homes were neater; children found it easier to get ready for school; children can play with toys, and family members had fewer falls and accidents.

