



# HANDPUMP SUSTAINABILITY STUDY

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# PROJECT PURPOSE

- Improve handpump design
- Increase reliability of handpumps
- Help provide access to clean water



# WHY?

Pumps experience failure as early as 3 months after installation

36% - 68% of handpumps across Africa are nonfunctional

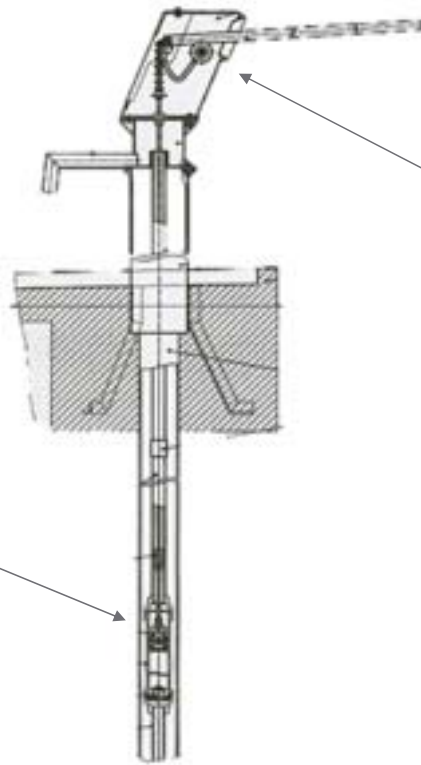
Over 3 million people die every year from drinking unsanitary water

# SURFACE VS WELL WATER



# OUR SOLUTION: REDESIGN

Poppet Valve



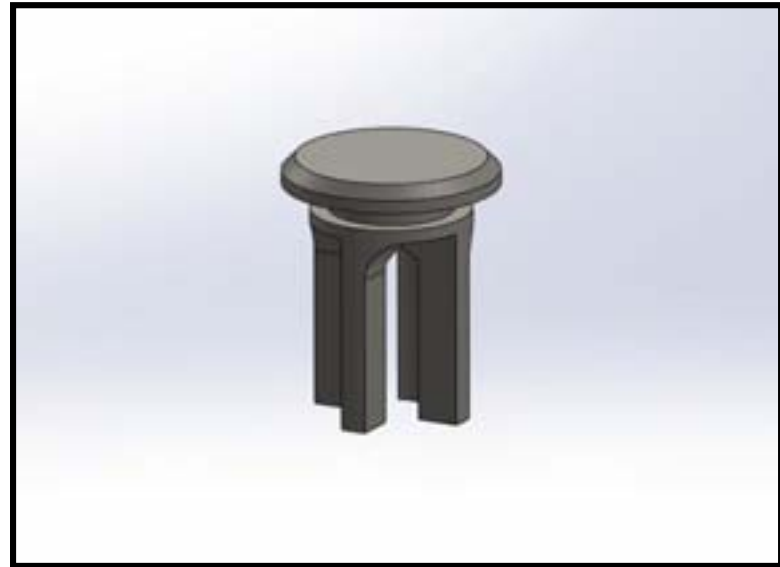
Ball Bearings

# REDESIGN: POPPET VALVE

Cast Stainless Steel

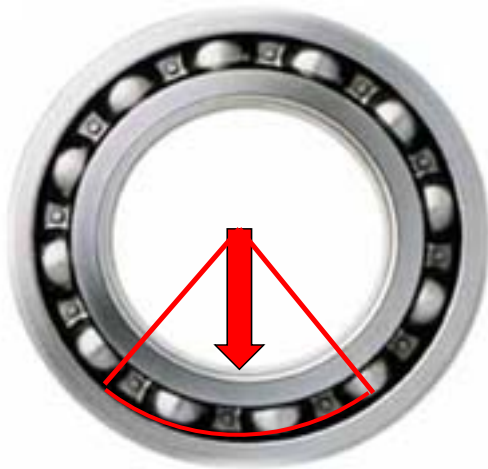


Machined Stainless Steel



# REDESIGN: BALL BEARING

## Deformed Ball



# OIL-IMPREGNATED BRONZE BUSHING





# OIL-IMPREGNATED IRON BUSHING



# ANTICIPATED IMPROVEMENT

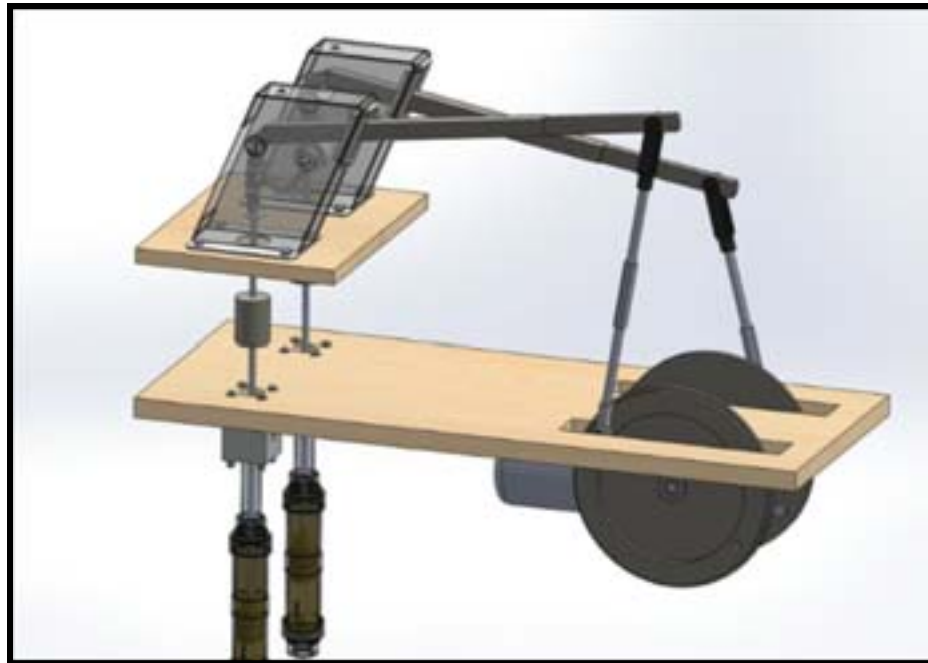
1 Year

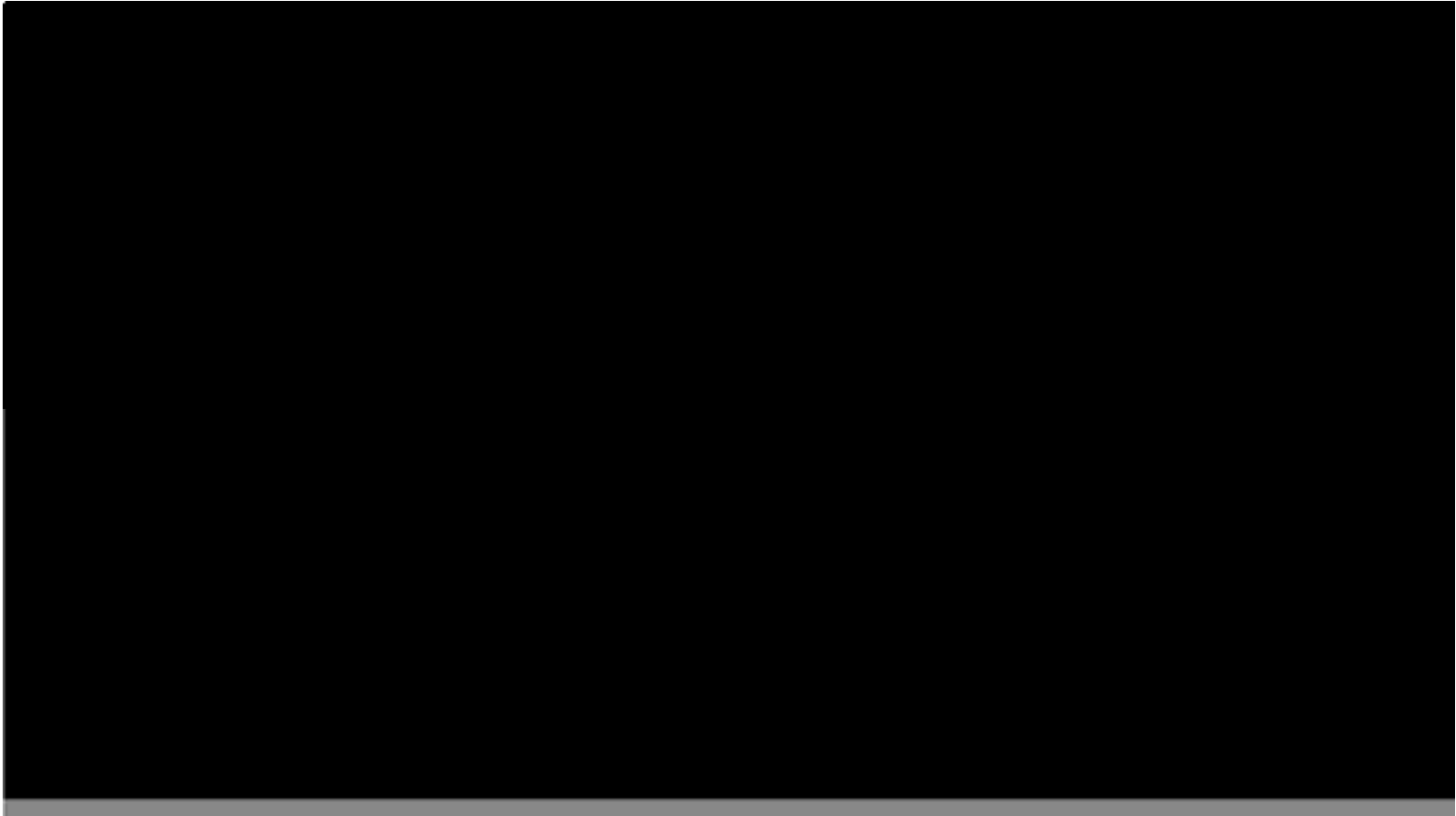


3 Years



# TESTING BENCH





# CONSTRUCTING THE TESTBENCH



# FINISHED TESTBENCH

Safety Box



Paddle Switch

# DESIGN OUTREACH LIFE PUMP

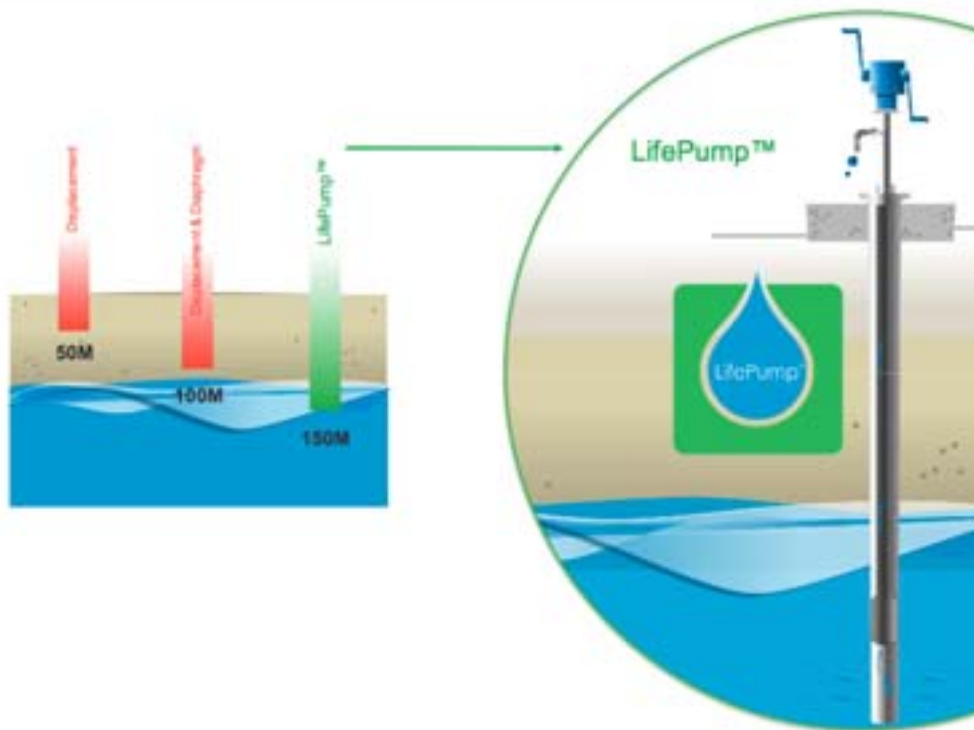


# PROGRESSIVE CAVITY PUMP





# REACHING DEEP WATER



# ACKNOWLEDGEMENTS

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QUESTIONS?