

# Safety and Quality as Overlooked Aspects of Rural Development

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## Background

- Safety is too often an after thought, sometimes too late
- Quality installation is critical for project success
- SmartVillage has made Safety and Quality (Standards and Reliability) additional pillars of its projects

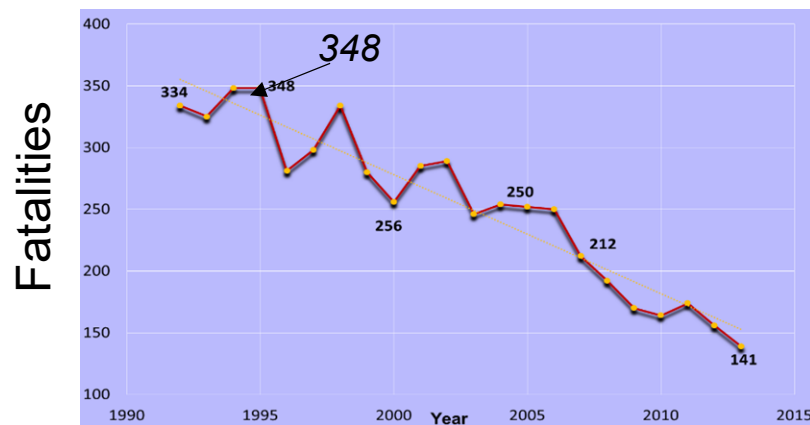


*Photo credit: C. Satish*

## Background: Safety, tale of two situations

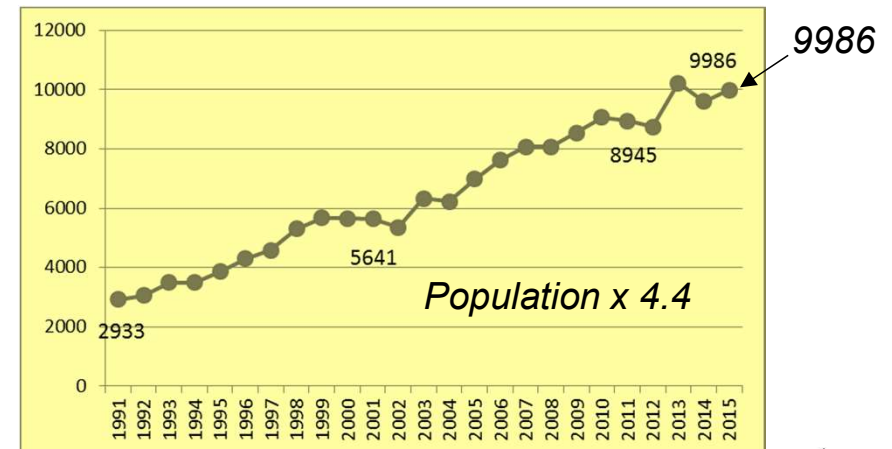
- Developed countries learned the hard way; Numbers now going down despite larger populations and increased use of electricity
- Development does not have to follow the same pattern

### Fatal Work-Related Electrical Injuries in the U.S. , 1992-2013



Source: "Occupational Injuries from Electrical Shock and Arc Flash Events", R.B. Campbell, ScD. (2015)

### Fatal Electrocutions in India, 1991-2015 (reported by NCRB)



Source: C. Satish, Conference on Electrical Safety, India, 2017

# What is quality?

- In the context of an ISVx project:
- Quality is a catch-all term for several interconnected features:
  - Good specs
  - Performance verification
  - Standards:
    - To ensure product compatibility with country location
    - Product uniformity and compatibility
- Purpose:
  - Quality product means reliable installation
  - Less maintenance increases ROI (return on investment)
  - Happy entrepreneur, happy customers spread the word on benefit of technology
  - Less maintenance, proper grounding, etc, means safer installation



Shock-resistant  
pump starter  
(C. Satish)

## Examples: Safety improvements in rural India

- Field study by C. Satish in India (2010's) revealed:
  - Majority of electrical accidents not in urban or factory settings
  - Major sources were in rural India with:
    - Down powerlines
    - Faulty equipment



Source: "Awareness and Prevention of Electrical Accidents",  
[ieef.tv](http://ieef.tv)

## Down powerlines: Solutions

- 1) Better design and maintenance (utility responsibility)
- 2) Education and awareness: Everyone's responsibility



Source: "Awareness and Prevention of Electrical Accidents",  
[iee.tv](http://iee.tv)

## Quality : Pump-motor grounding

- Many farmers in rural India use pumps for irrigation
- Pumps are driven by induction motors with a soft starter
- Lack or improper grounding, metallic enclosure, etc, lead to:
  - Equipment failure
  - Farmers attempting to fix problem themselves



Source: "Awareness and Prevention of Electrical Accidents",  
[ieeetv.org](http://ieeetv.org)

## What is SmartVillage doing?

- Include quality and safety as part of the application process
  - Raises awareness of issue
  - Improves project success potential
- Gather data on these subjects from on-going projects
  - Improves understanding of critical issues
- Develop information suited to rural / developing areas
  - Modeled after C. Satish's work and movie on safety for rural India:  
<https://ieeetv.ieee.org/ieeetv-specials/awareness-and-prevention-of-electrical-accidents>
- Participate in conferences and workshops (educate the educators/engineers):
  - Electrical Safety Workshops in India, Brazil, Costa-Rica
  - PowerAfrica Conference (panels, keynotes, tutorials)



## Conclusion

- SmartVillage and generally electrification efforts can learn from past mistakes of development
- Number one solution: Awareness and education
  - Emphasize quality as beneficial long term
  - Raise awareness of safety issues
- Spread the word!

