





## Project Usiru http://bit.ly/UsiruBLR Smart Policy thru Rich Data : Largest Crowd Sourced Local Experiments

# www.iotforindia.org/usiru

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## SangEnnovate



Devic

Earth

Pulsed

weak

radio waves

PureSkies

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# Air Quality Index (AQI)

### Passive

- Polluters are Industrial actors
- Emission norms on Cars, Industry
  - Polluter pay
- Monitor Compliance

#### Issues

- What if not just Industrial actors
  - Indonesian Forest Fire → Smog in Singapore
  - Thar Desert sand particles in Delhi
  - Construction Dust
  - Crop Burning
  - Chula in Villages?
- What if AQI is not improving

Can Communities do anything except wait for Regulators?



#### **Bangalore Estimates: CAP**



## **Air Pollution: Volatile indicators**

#### PMI varies up to 100% a day. PMI varies up to 800% across seasons



- Current sophisticated, expensive ambient air pollution monitoring technology is not economically sustainable as the sole approach and cannot keep up with current needs, specifically new monitoring networks and special purpose monitoring.
- US EPA: New Generation Air Monitoring Roadmap 2013

## PDCA for AQI

- Currently very few measurements of AQI
- Not easy to "prove" cause or showcase improvement
- Lots of guess work in AQI causes and emission norms and charges
- Difficult to establish ROI on Interventions
  - Filter & Scrubbing, CityTree, UrbanForest

## Our approach

- Re Imagine the data collection
- Improve the science
- Help communities take charge



## **Gallery of Interventions 15-30% reduction?**

Dan Roosegaarde

Smog Free

bicycle,

S. Korea proposes rain project with China to clean Seoul air





World's largest air purifier is undergoing testing and will soon start operating in China

Written by TheCivilEngineer.org Published in News on Projects / Industry

An "urban curtain", it captures CO2 from the atmosphere and stores it in real-time: 16.2X7 meters photobioreactor module. Approximately one kilo of CO2 per day, equivalent to that of 20 large trees Photo Synthetica.



**3M** Smogreducing Granules . Sun No<sub>x</sub>





Devic Earth PureSkies Pulsed weak radio waves

## **Plan: Sensor Cloud**

- 6-20 high cost fixed location PMI + VOC (Volatile Organic gases). Regulatory grade Gold class
- 30-100 medium cost fixed location Commercial grade Silver
- 1,500-2,000 low cost fixed location Commodity grade Bronze class.
- 300-800 low cost mobile location Bronze grade
- 10-25 weather stations for wind, precipitation, sunshine, temperature. Mixture from community, companies and government.
- 20-50 vibration and noise sensors to detect usage of Diesel gensets
- 8-15 location based hourly photographs of view from road junctions, airport, metro and bus stations etc
- 80 stations of KSNDMC (Karnataka State National Disaster Management Centre) providing data on water precipitation and rainfall
- Use the new C-40 Air Pollution Control Command Room
- Special custom vans with high cost sensors for calibration of Bronze grade sensors in use





# The Blog: www.iotforindia.org/usiru

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Smart Policy thru Rich Data : Largest Crowd Sourced Local Experiments

- Suggest Device providers, residents using AIQ measurements to join. Collaborate form at website
- Volunteer for Usiru
  - Outreach,
  - Sponsorship,
  - Data Science,
  - communities wanting to experiment

