

Assessing environmental health risks in India

Missing pieces of the puzzle?

Or

The missing puzzle?

Kalpana Balakrishnan, Sankar Sambandam, P.Jayachandran

R. Padmavathi, V. Thanasekaraan

SRMC & RI, Chennai

Ground reality !



Copyright © 1999 United Feature Syndicate, Inc.
Redistribution in whole or in part prohibited

Areas of focus

- **Environmental quality assessments (65%)**
- **Exposure assessments(20%)**
- **Health outcome assessments with exposure indicators / “exposure proxy”s (10%)**
- **Toxicology (<5%)**
- **Health impact assessments (<5%)**
- **Primary environmental epidemiology (<5%)**
- **Environmental health economics(<1%)**
- **Environmental genomics and molecular epidemiology (<1%)**

Risks addressed

- Outdoor (criteria pollutants)(60%)
- Indoor (PM) (15%)
- Occupational (PM, fibers) (15%)
- Select air toxics (10%)

Nature of study outputs

- Descriptive
- Analytical
- Conclusive

	% foreign citation
India	87%
US	37%
Pakistan	96%

University 25% of all but over 80% of all peer reviewed publications

Others including 70% of all but less than 20% peer reviewed publications

National Research
Organisations

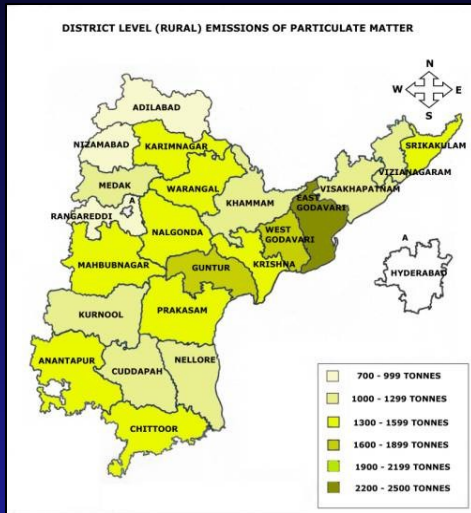
Results from select studies (Environmental quality)

- More than 50 studies describing status of ambient air quality
- Most describe yearly or monthly city wide averages with a few describing temporal and spatial variations/ distributions
- Very few organised to allow time –series analyses
- Fewer organised to allow easy importation across investigators and/or statistical packages
- MOEF CRA study among the few multi-centric ones

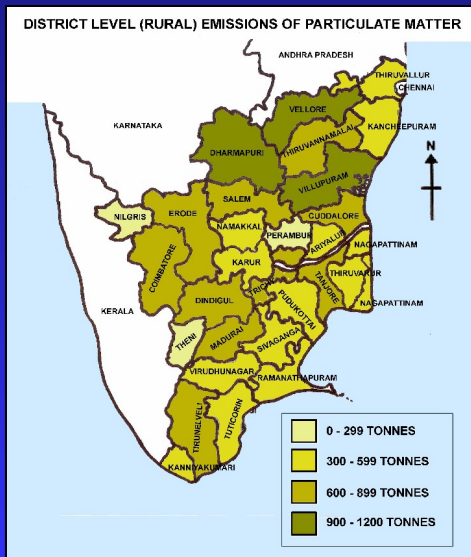
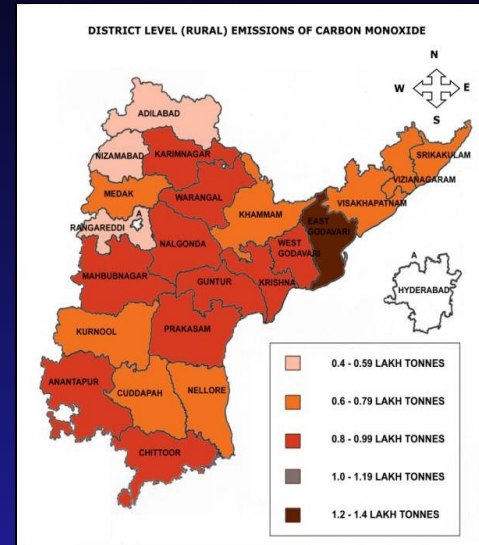
Results from select studies (Exposure Assessment)

- ❖ Focus of many recent indoor studies
- ❖ State level exposure atlas generation in progress in TN, AP (Lead by SRMC under UNDP Cap21, World Bank, USEPA funded projects)
- ❖ Links with health assessments in many states (IGIDR under UNDP Cap 21; TERI/SRMC under the “HEED” project)
- ❖ Has allowed “intervention effectiveness” assessments in AP (SRMC/ TERI under USEPA funding)
- ❖ Considerable pool of expertise in large scale field intensive assessments
- ❖ Recent urban studies also addressing indoor and other exposure contributions

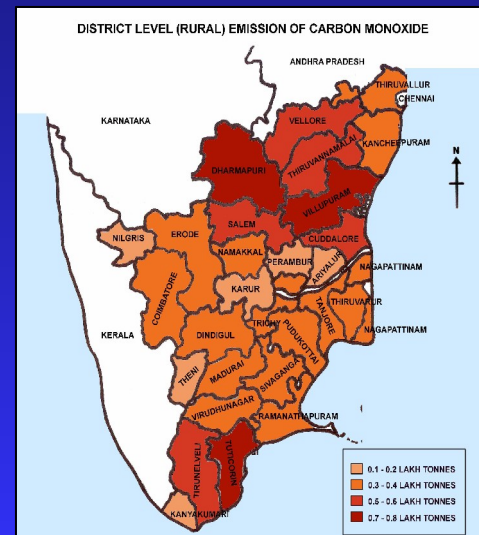
District level emissions of health damaging pollutants from household fuel use (SRMC/TERI study funded by USEPA)

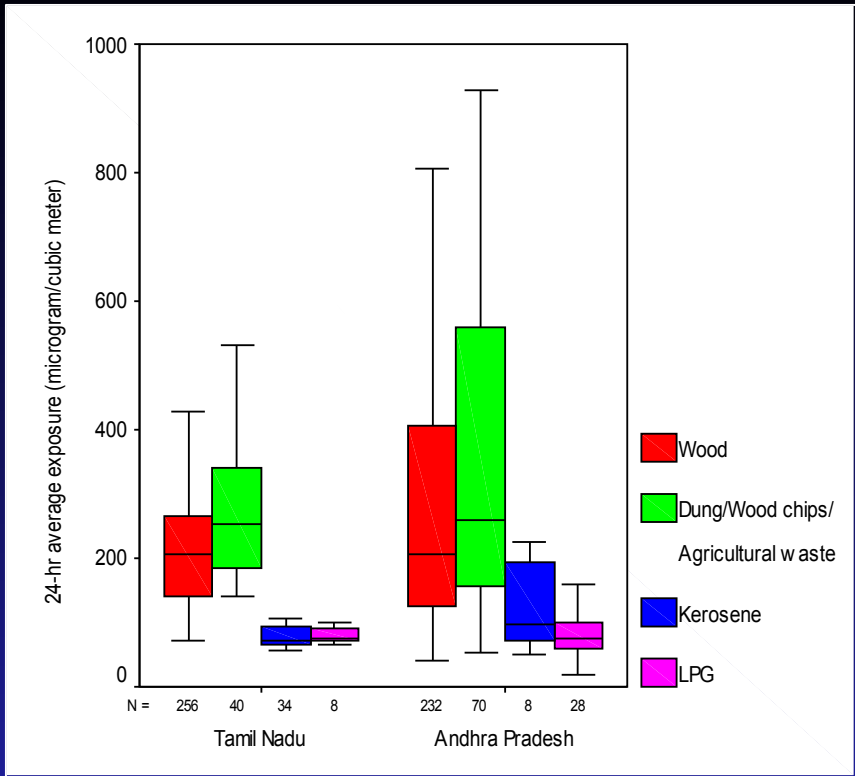


Andhra Pradesh

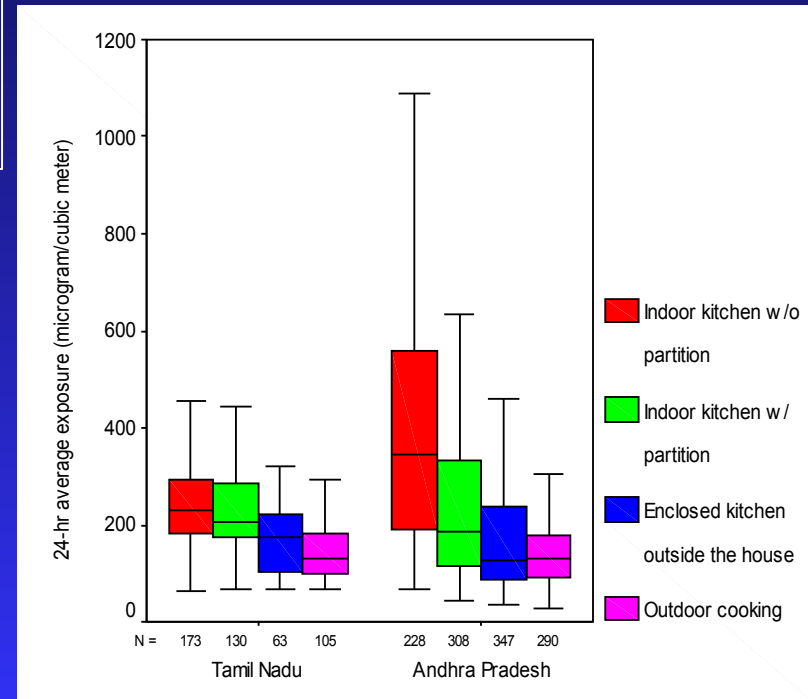


Tamil Nadu

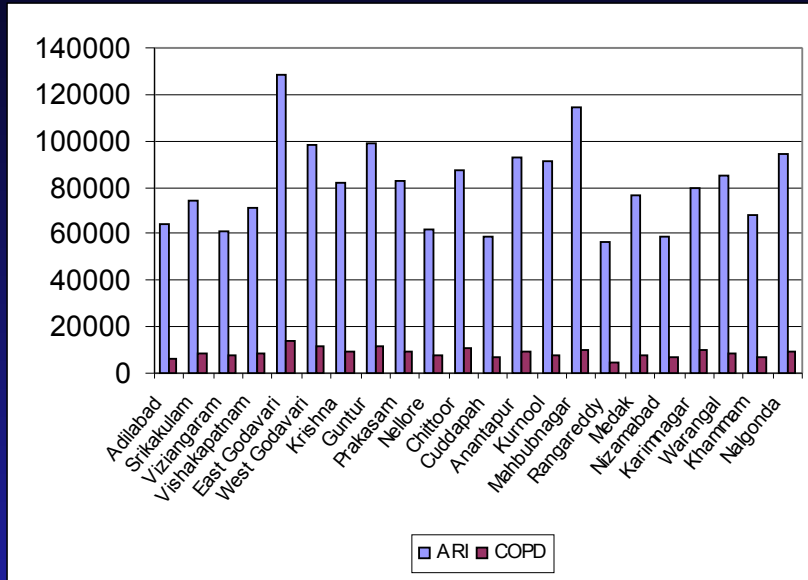




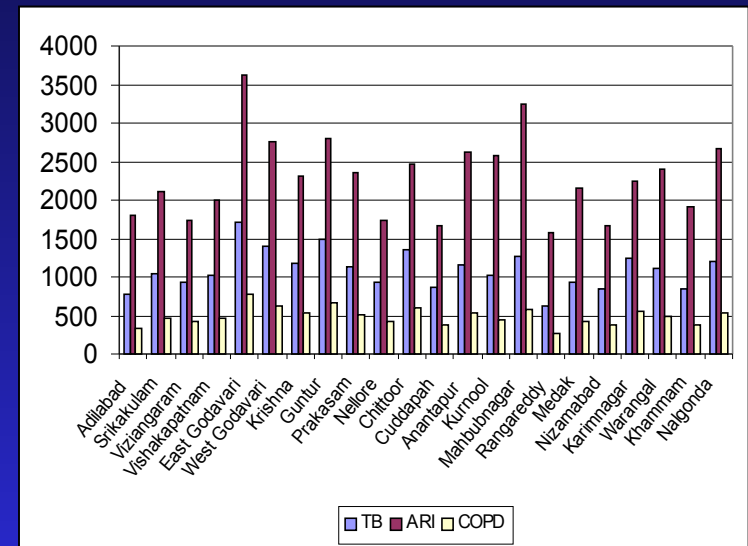
Daily average exposures stratified across exposure determinants in rural households of AP and TN
Balakrishnan et. al. 2002



BOD attributable to IAP across districts (SRMC/TERI study funded by USEPA)

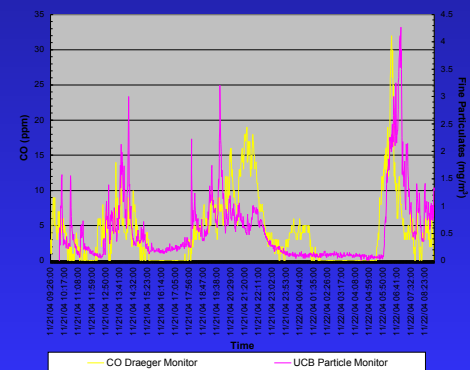
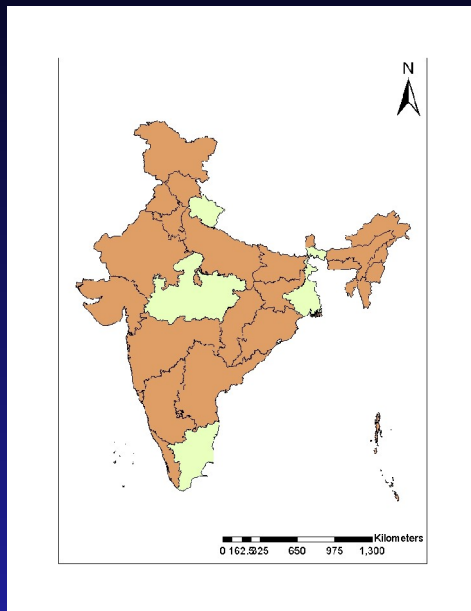


DALYS



DEATHS

TERI/ SRMC/ UCB/University of Maryland study funded by NIH)



Results from select studies (Health impact assessments)

Chennai (W. Bank 1992)	Rs.275/person
Chennai – Manali (SRMC/IGIDR 2002)	Rs.1626/person
Chennai (W. Bank 2002)	Rs125/person
Bombay (W. Bank 1992)	Rs.734/person
Bombay(URBAIR, W. Bank)	Rs.1840/person

Results from select studies (Epidemiology)

- ❖ HEI special report cites 15 studies including 1 time series study prior to PAPA
- ❖ MOEF CRA nine city study under compilation
- ❖ 3 time series studies underway
- ❖ Several indoor air studies on respiratory morbidity, TB, cataract associated with solid fuel smoke exposure underway
- ❖ Indo –US consortium on occupational and environmental health has a special focus on environmental epidemiology

Results from select studies (Molecular Epidemiology)

- ❖ Biomarker studies in Delhi and Calcutta (CCI)
- ❖ Recent new mechanistic studies on endocrine disruption associated with community exposures to pesticides (reported by NIOH)
- ❖ Single-nucleotide polymorphisms being examined for lead (SRMC/Fogarty; ITRC), PAHs (ITRC), Arsenic (ROC)
- ❖ Infra-structure for toxico-genomics and high throughput genomic analyses available at several centres but not widely used for environmental genomics applications

Important considerations for next steps

- Engaging in QA audits for data quality
- Setting up accessible databases for pooled analyses
- Specifying a research agenda
- Setting realistic budgets
- Establishing a strong peer-review mechanism for outputs generated from funded projects

Choices of paradigms?

- **More evidence for policy vs. more policy for evidence?**
- **Regulate and monitor vs. monitor and regulate?**
- **Model to fit or fit to models?**
- **Numbers for credibility vs. credibility for numbers?**

Feasible

Realistic
target setting
makes the feasible
more effective

vs.

Holistic
capacity building
makes the effective
more feasible

Effective