Population- Environment- Settlement (POP-ENVIS)

Aparajita Chattopadhyay

International Institute for Population Sciences

Mumbai

About the Institute

- The International Institute for Population Sciences (IIPS) serves as a regional Institute for Training and Research in Population Studies for the ESCAP region. It was established in Mumbai in July 1956.

- Besides teaching and research activities, the Institute also provides consultancy to the Government and Non-Government organizations and other academic institutions. Over the years, the Institute has helped in building a nucleus of professionals in the field of population and health in various countries of the ESCAP region. During the past 53 years, students from 42 different countries

POP- ENVIS objectives

- Compilation of research article, abstract of published paper, environment related news, book reviews related to environment and population.
- Three – four newsletters to be published in a year compiling information of POP- ENVIS research and activities.
- Organizing workshop for capacity building for researchers where experts can be invited to deliver lectures.

POP- ENVIS objectives

- To create community level awareness
- Generating data environmental health through surveys.
- Usual updating of the web site with relevant data and information. Also creating web site in regional language.
- Answering to the queries through e mail.

POP- ENVIS: Activities at a glance

2013 May- 2014 March

Ministry granted fund (carry forward)

Recruitment of staff (1 IT staff)

Publication of bulletin (2 bulletins)

Development of Web page

Policy brief (2)

2014 April- 2015 January

Workshops (4)

Purchase of hardware and staff recruitment

Publication of 3 bulletins

Policy brief (3) – special issue on environment (1)

Programme with slum dwellers (3 events- 1 ongoing)

HWS survey: ongoing

Web development

Major activity 2014-15

Objective	Work Done
Compilation of research article, abstract of published paper, environment related news, short notes, photos, essays, book reviews related to environment and population	• Published five research articles. (See point IV) • Constant updating of website with published research articles and news. • Received three essays on competition related to population and environment (Under process of publication). • Flashing conference detail, environmental news in bulletin.
Three – four newsletters to be published in a year compiling information, POP- ENVIS research and activities.	• In 2014-15 published two bulletins each having 28 pages.
Usual updating of the web site with relevant data and information. Also creating web site in regional language.	Subject area, news article with sources, kids section, publication: Newsletter, policy brief designing etc are done and uploaded on website.

Organizing workshop for Capacity building

(Organized by Dr. Aparajita C with support of Ramnayan Chandrakala)

- **Organized 4 workshops**

Theme	Experts
➢ **Workshop on Environmental Sustainability and Modeling. (Dated: 13th -15th May 2014)**	Dr.Amiya Kumar Sahu Dr. D.B. Naik Dr. T Jayaraman Dr.Samapti Guha Dr. Faujdar Ram
➢ **Workshop on GIS and its Applications (Dated: 16th -22nd July 2014)**	Mrs. Sudha G
➢ **Workshop on Gender, Development & Environment (Dated: 11th -14nd August 2014)**	Dr. Anuja Gulati Dr. T.K. Roy Dr. Ilina Sen Dr. P. Bindhulakshmi Dr. Subhadra Mandalika Dr. Srijit Mishra
➢ **Training of trainer workshop and de-briefing related to housing, water and sanitation survey of Mumbai slums (Dated: 21st – 22nd January 2015, 30th January 2015, 9th February 2015)**	Dr. Aparajita C

To create community level awareness (Organised by POP-ENVIS with support of IIPS students)	• **Environment day celebration.** (nearby Municipal-private schools) (Dated: 19th June 2014) • **Community Based Orientation Programme in Mumbai Slum** (Deonar area) (Dated: 21st – 22nd November 2013) • **Knowledge dissemination-literacy, Environmental health and Medical Check up** (Mankhurd) (Dated: Started from 15th January 2015 onwards) • **Swachh Bharat Abhiyaan 2014** (in and around IIPS) (Dated: October- December 2014) • **Air quality monitoring** (Dated: December 2013 onwards)

Generating data on Population and environmental health through surveys

(Conceptualised and proposed by Dr. Aparajita and implemented by POP-Envis staff R Chandrakala and G Sudha)

1. Housing, water and sanitation (HWS) Survey in Mumbai Slums.(1400 household data)

- Main objectives of the research work are:
- To investigate the housing, drinking water and sanitation facility available in the slums of Mumbai.
- To analyse the quality of drinking water at source and sanitation in different slums of Mumbai.
- To study cleanliness and associated issues of hygiene related to drinking water, sanitation and fuel use.
- To explore the suggestive measures of slum dwellers above issues.

2. Health problems of Slum dwellers (Ongoing)

- Disseminating knowledge on environmental health to slum dwellers
- Medical checkup by qualified doctors once in a week
- Collecting basic information in background and health issues

Site Suitability analysis on solid waste disposal in Mumbai	**Work in progress. Maps generated are uploaded in web page** **Analysis is done using toposheet (2011) and satellite images.**
Short Film	On Mumbai Slums: success stories (Yati).
Newspaper coverage on Envis	CO2 emission by urban households 16 times more than rural ones: Report (Dated: April 11, 2014 Indian Express)

Detailed information on publication

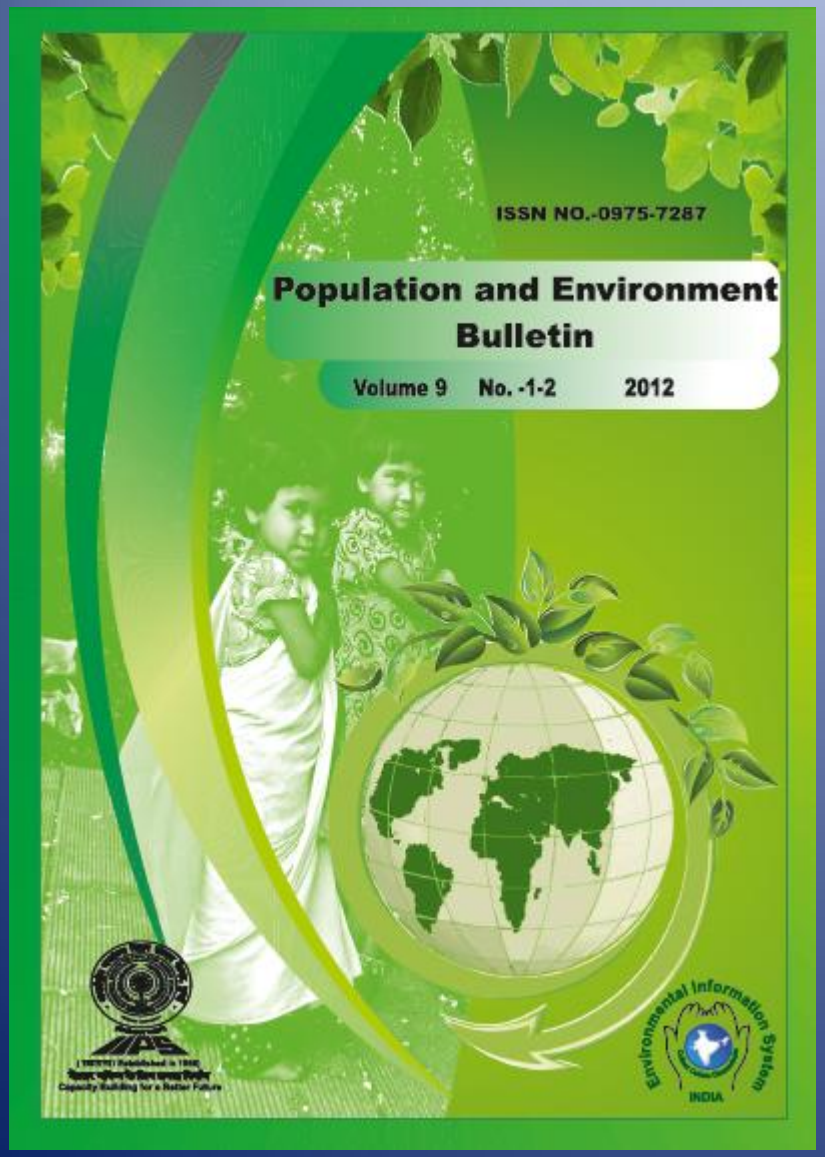
Publications 2014-15(print)

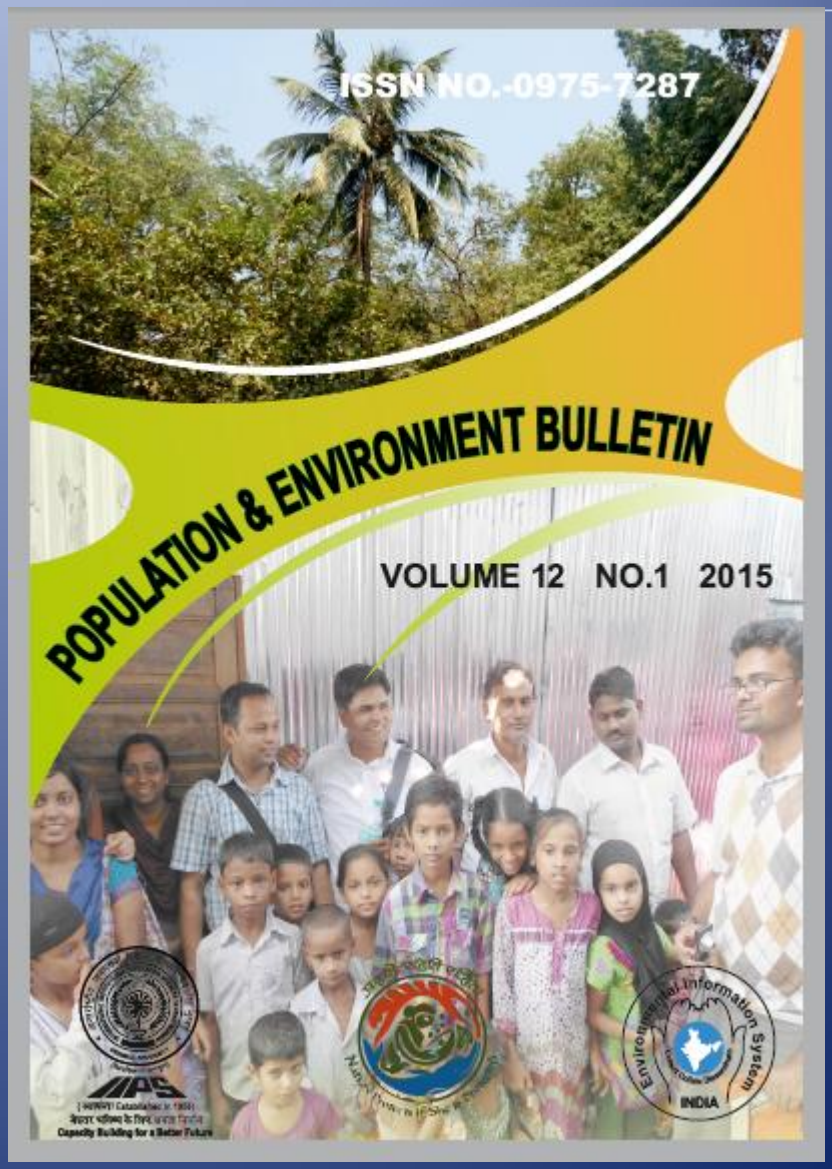
Quarter/ Volume/ Issue/ Theme	Main Articles	Number of copies printed and circulated
Volume 9 No. 1-2, 2012	• (Extra copies are printed as demanded by ENVIS)	Additional 70 copies
Volume 10 No.1, 2013	• (Extra copies are printed as demanded by ENVIS)	Additional 70 copies
Volume 10 No. 2, 2013	• **Increasing Population and Challenges to Sustainable Development.** • **Smart Cities for India.** • **Mumbai Mangroves – Dwindling Natural Resource.** • **Environmental Kuznets Curve of Selected Indicators 1980-2018.** • **Workshop on Environmental Sustainability and Modeling.** • **Environment Day Celebration.**	300 copies
Volume 11 No. 1-2, 2014	• (Extra copies are printed as demanded by ENVIS)	Additional 70 copies

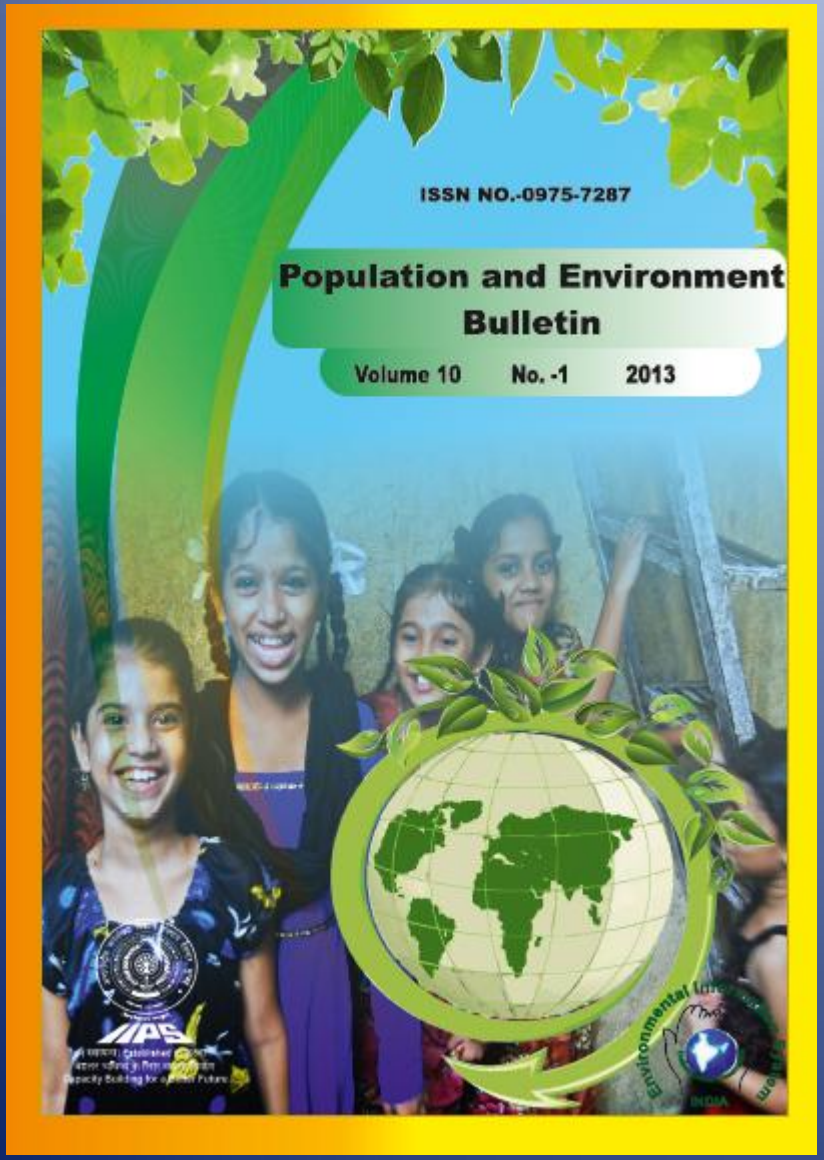
Volume 12 No. 1, 2015	• **Learning from a Community Based Orientation Programme in Mumbai Slum: Some Suggestive Measures.** • **Poem and Sketches.** • **Aren't we ready for riddance of inequalities in our social?** • **Swachh Bharat Abhiyaan.** • **Workshop on GIS and its Applications.** • **Data Generation on State of drinking water and sanitation in Mumbai slums.**	**300 copies**
Volume 12 No.2, 2015	• Under process of editing	300 copies

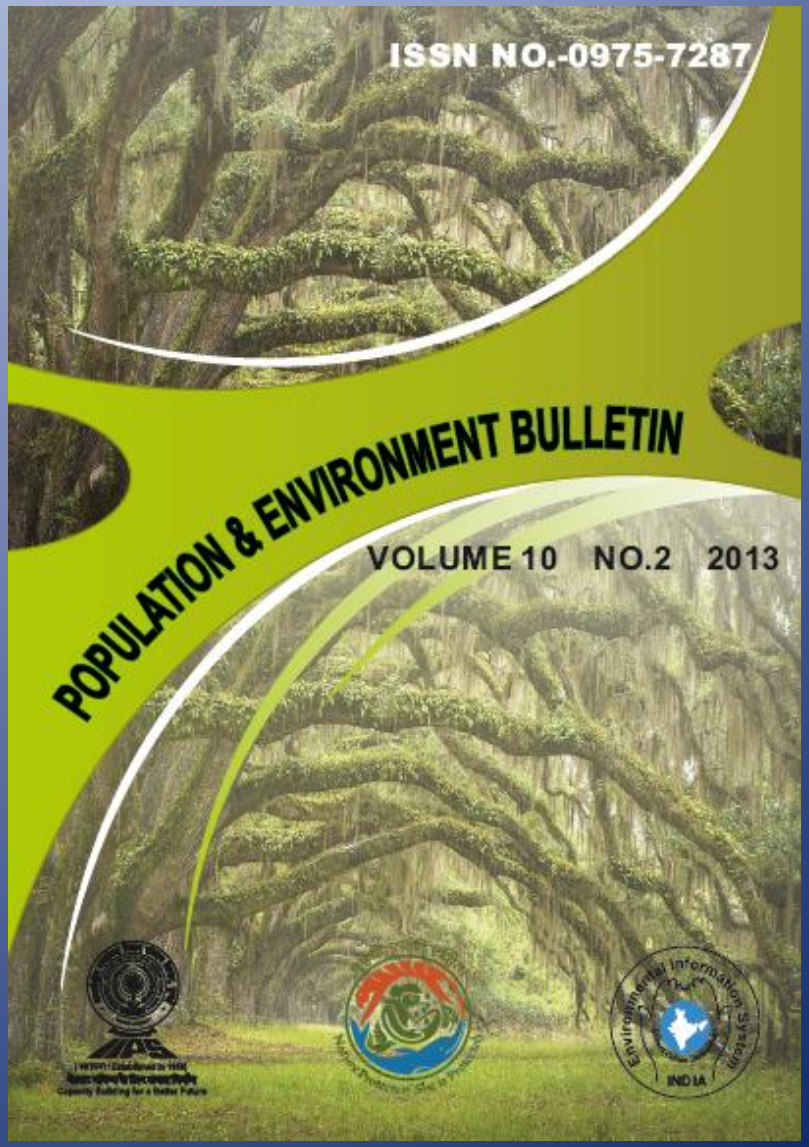
Glimpses of major activity

Publications (print)






ISSN NO.-0975-7287
Population and Environment Bulletin
Volume 10 No. -1 2013


ISSN NO.-0975-7287
POPULATION & ENVIRONMENT BULLETIN
VOLUME 10 NO.2 2013

Policy Briefs : policy briefs (online)

Editorial

Green house effect and global warming are of high priority in today's policy process. In this view, the second issue of policy brief throws light on household energy use in India, culling data from National Sample Survey. A brief result of the fuel use pattern and differentials are portrayed in this issue.

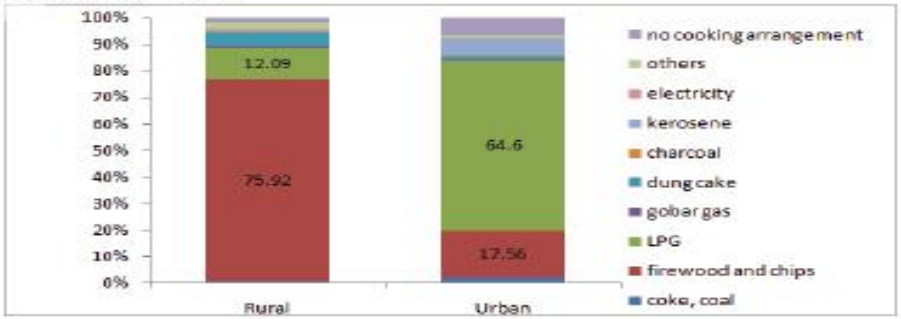
(Aparajita Chattopadhyay)
E mail: popenvis@iips.net
Web site: www.iipsenvis.nic.in
Pop-Envis team
IIPS, Mumbai.

Household Energy use in India: Analysis of NSS data

Kaveri Patil
kaveripatil26@gmail.com

In India the domestic sector is one of the largest consumers of energy accounting half of the total energy consumption. In household, energy is mainly used for cooking, water and space heating and lighting. Delivery of clean and affordable energy for poor household in developing countries is an important requirement. Lack of access to sufficient amount of clean and efficient energy remains a serious challenge in India.

Figure 1: Percentage of households using different Cooking fuels in rural and urban India, 2009-10



The analysis is based on data of National Sample Survey organization (NSSO), Government of India (66th Round NSSO, 2010). Total 100855 number of

Editorial

Land dues, Land cover and geomorphical space are important components of urban planning. Mumbai is the largest metropolis of India, supports huge population, infrastructure etc. It needs constant refinement of urban plan to cope with development.

The current policy brief gives a overview of our preliminary analysis on different aspects of land utilization.

(Aparajita Chattopadhyay)
E mail: popenvis@iips.net
Web site: www.iipsenvis.nic.in

Pop-Envis team
IIPS, Mumbai.

Photograph: Aparajita Chattopadhyay

Site Suitability for Solid Waste Disposal and Health Condition of the Solid Waste Workers – A Case Study of Mumbai

Study Area

Mumbai Island is located on the western coast of India and experiences a tropical climate with copious rainfall. Geographically it lies between 18° 50' and 19° 18' North latitudes and 72° 47' and 72° 59' East longitudes.

Land use / Land cover

Topographical sheet (Sheet no. E43A16, E43G131 and E43A15 & A11) of scale 1:50,000 were scanned and rectified using Arc GIS 10.0v. Land use is a product of interactions between a society's cultural background, state, and its physical needs on the on hand, and the natural potential of land on the other (Balak Ram and Kolarkar 1993).

Land Cover may be defined as the biophysical earth surface.(Sarma et al, 2008) implies the physical or natural state of the Earth's surface (Zubair, A.O, 2006). The USGS devised a land use and land cover classification system for use with remote sensor data in the mid – 1970's (Anderson et al., 1976). Land use /

Editorial

Economic growth is always reviewed in context of sustainable development. This policy issue briefs the finding of current macro situation of different pollutant in India and the effect of fuel use (kind of stoves) on child health.

(Aparajita Chattopadhyay)
E mail: popenvis@iips.net
Web site: www.iipsenvis.nic.in

Pop-Envis team
IIPS, Mumbai.

Photograph: Robert Kendrick, National Geographic

Carbon Emission and HDI in India

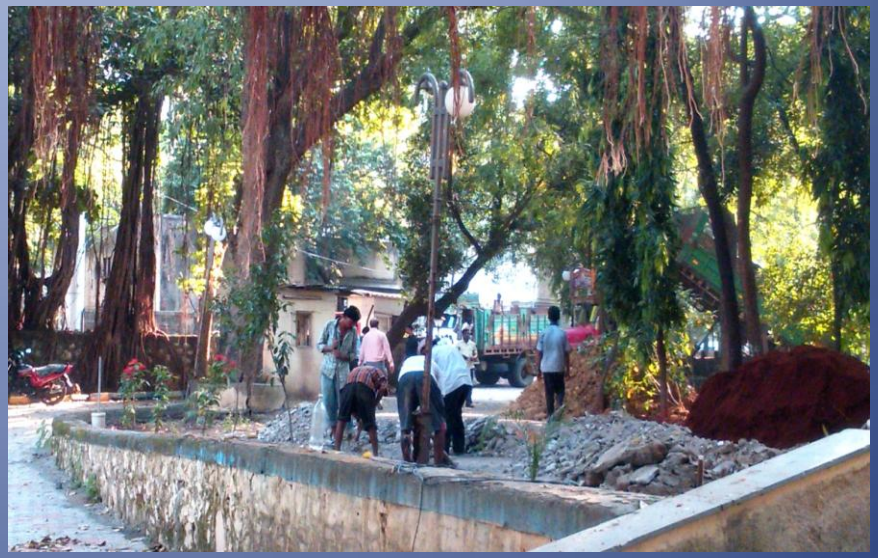
Aparajita Chattopadhyay and Kaveri Patil
International Institute for Population Sciences

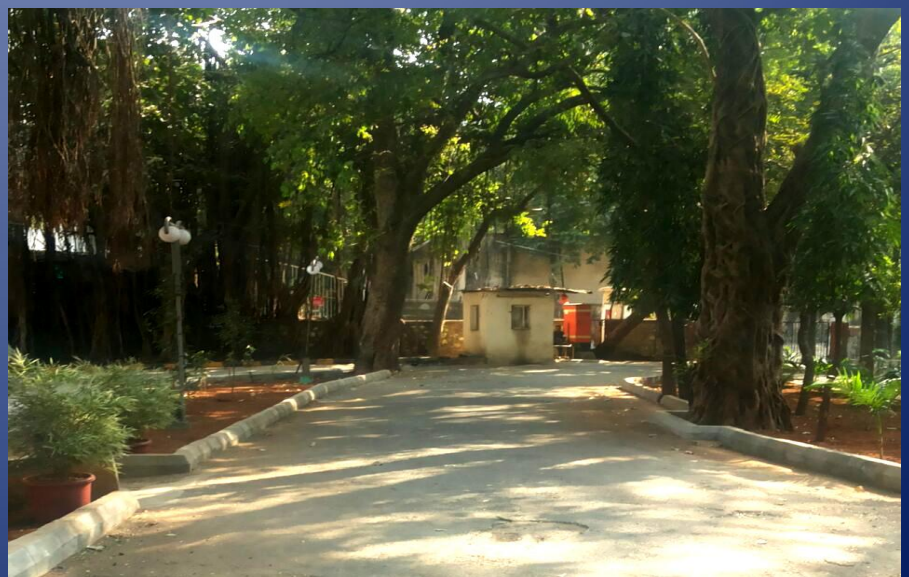
Carbon dioxide is the major green house gas for global warming. In terms of total co2 emission, India is among the foremost countries of the world. Out of total Co2 emission in India, almost half are from household energy use. Delivery of clean and affordable energy for poor household in developing countries like India is an important requirement. Lack of access to sufficient amount of clean and efficient energy remains a serious challenge in India. Hence, it is necessary to understand the current scenario of Co2 emission from Household energy use and its association with development indicators like HDI.

The paper is based on National Sample Survey (NSS), Government of India (66th Round NSSO, 2010). Total 100855 number of sampled household were surveyed, out of which 59119 and 41736 households were from rural and urban areas respectively. The CO2 emission coefficients are adopted from published literature of Venkataraman et al. (2010), Mestl and Eskeland (2009) and Parikh J. et al. (2009). Best fit regression lines are estimated while understanding the relation of Co2 emission (total and per capita) with development parameters like human development index, total population, net state domestic product, proportion literate etc.

There is a strong positive association of Co2 emission with total population and net state domestic product. That is, with increase in these two factors, Co2 emission also increases. However, total emission does not have any association with level of literacy and Human Development Index (HDI). While per capita Co2 emission has a strong positive relation with Human development index as shown below. It has a negative association with population density and negligible positive relation with state wealth.

Swachh Bharat Abhiyyan





Four Workshops:

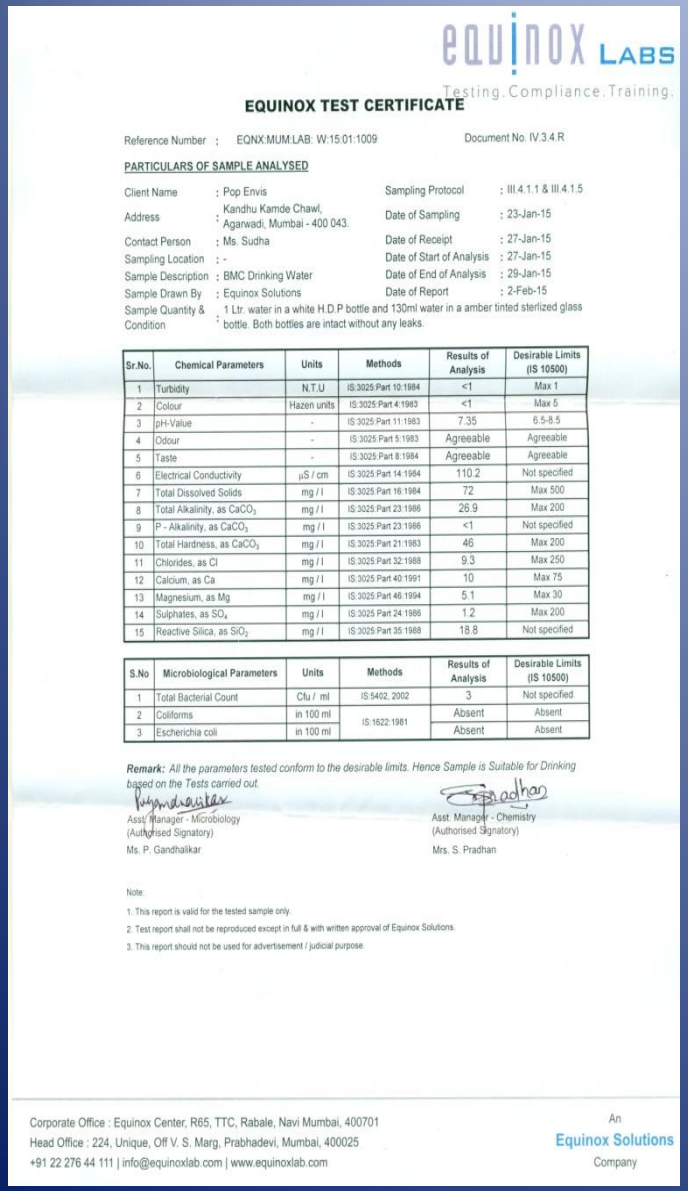
World environment day

HWS survey

Selected wards:

Ward	HHs	
D	48	CST
R/C	95	BORIVILI
M/W	240	Govandi/ Chembur
M/E	260	Mankhurd
R/S	400	Kandivili
S	520	Bhandup

Data of HWS survey



equinox LABS
Testing. Compliance. Training.

EQUINOX TEST CERTIFICATE

Reference Number : EQNX:MUM:LAB: W:15:01:1009 Document No. IV.3.4.R

PARTICULARS OF SAMPLE ANALYSED

Client Name	: Pop Envis	Sampling Protocol	: III.4.1.1 & III.4.1.5
Address	: Kandhu Kamde Chawl, Agarwadi, Mumbai - 400 043.	Date of Sampling	: 23-Jan-15
Contact Person	: Ms. Sudha	Date of Receipt	: 27-Jan-15
Sampling Location	: -	Date of Start of Analysis	: 27-Jan-15
Sample Description	: BMC Drinking Water	Date of End of Analysis	: 29-Jan-15
Sample Drawn By	: Equinox Solutions	Date of Report	: 2-Feb-15
Sample Quantity & Condition	: 1 Ltr. water in a white H.D.P bottle and 130ml water in a amber tinted sterlized glass bottle. Both bottles are intact without any leaks.		

Sr.No.	Chemical Parameters	Units	Methods	Results of Analysis	Desirable Limits (IS 10500)
1	Turbidity	N.T.U	IS:3025:Part 10:1984	<1	Max 1
2	Colour	Hazen units	IS:3025:Part 4:1983	<1	Max 5
3	pH-Value	-	IS:3025:Part 11:1983	7.35	6.5-8.5
4	Odour	-	IS:3025:Part 5:1983	Agreeable	Agreeable
5	Taste	-	IS:3025:Part 8:1984	Agreeable	Agreeable
6	Electrical Conductivity	µS / cm	IS:3025:Part 14:1984	110.2	Not specified
7	Total Dissolved Solids	mg / l	IS:3025:Part 16:1984	72	Max 500
8	Total Alkalinity, as $CaCO_3$	mg / l	IS:3025:Part 23:1986	26.9	Max 200
9	P - Alkalinity, as $CaCO_3$	mg / l	IS:3025:Part 23:1986	<1	Not specified
10	Total Hardness, as $CaCO_3$	mg / l	IS:3025:Part 21:1983	46	Max 200
11	Chlorides, as Cl	mg / l	IS:3025:Part 32:1988	9.3	Max 250
12	Calcium, as Ca	mg / l	IS:3025:Part 40:1991	10	Max 75
13	Magnesium, as Mg	mg / l	IS:3025:Part 46:1994	5.1	Max 30
14	Sulphates, as SO_4	mg / l	IS:3025:Part 24:1986	1.2	Max 200
15	Reactive Silica, as SiO_2	mg / l	IS:3025:Part 35:1988	18.8	Not specified

S.No	Microbiological Parameters	Units	Methods	Results of Analysis	Desirable Limits (IS 10500)
1	Total Bacterial Count	Cfu / ml	IS:5402, 2002	3	Not specified
2	Coliforms	in 100 ml	IS:1622:1981	Absent	Absent
3	Escherichia coli	in 100 ml		Absent	Absent

Remark: *All the parameters tested conform to the desirable limits. Hence Sample is Suitable for Drinking based on the Tests carried out.*

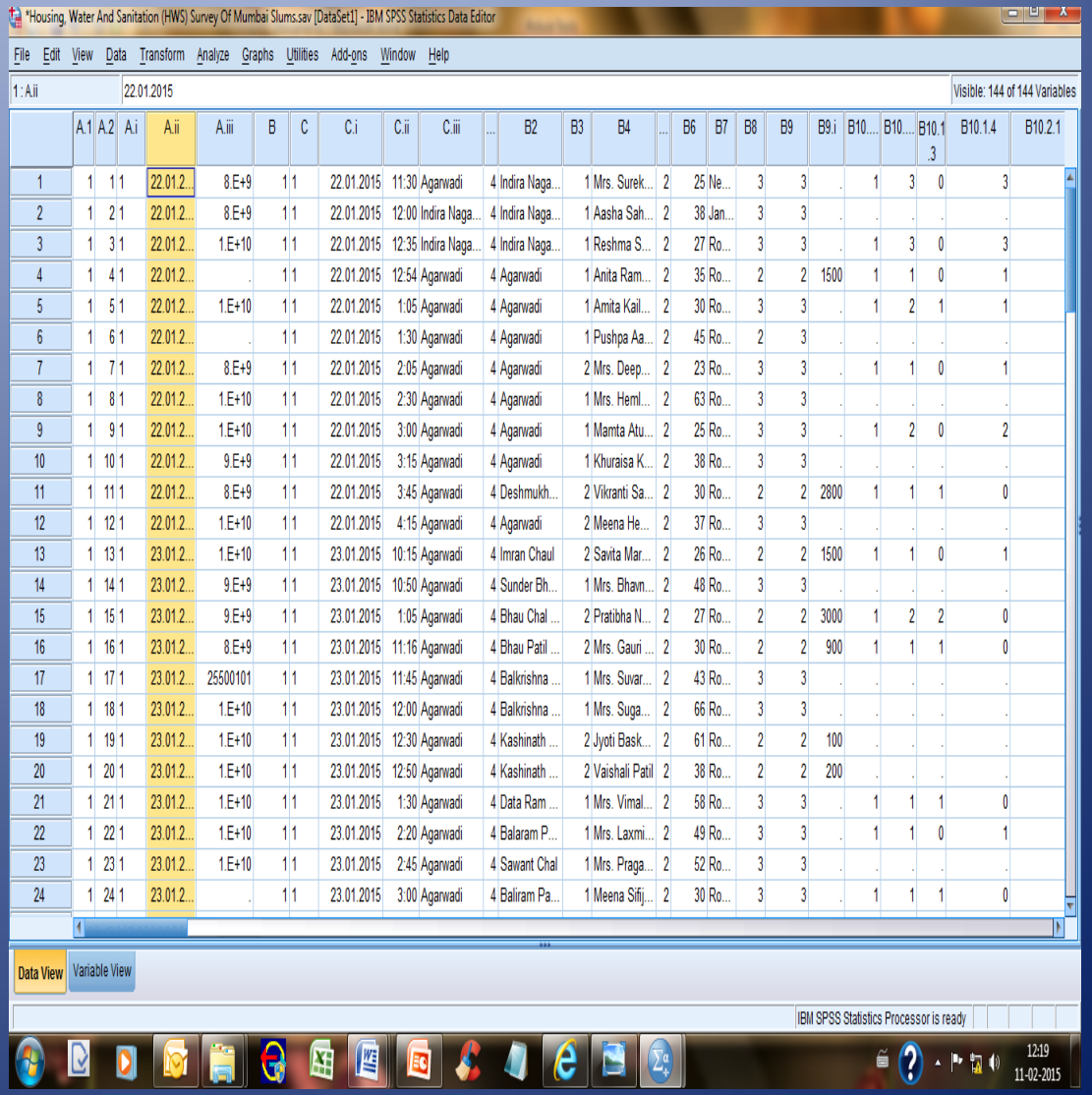
Asst. Manager - Microbiology (Authorised Signatory)
Ms. P. Gandhalikar

Asst. Manager - Chemistry (Authorised Signatory)
Mrs. S. Pradhan

Note:
1. This report is valid for the tested sample only.
2. Test report shall not be reproduced except in full & with written approval of Equinox Solutions.
3. This report should not be used for advertisement / judicial purpose.

Corporate Office : Equinox Center, R65, TTC, Rabale, Navi Mumbai, 400701
Head Office : 224, Unique, Off V. S. Marg, Prabhadevi, Mumbai, 400025
+91 22 276 44 111 | info@equinoxlab.com | www.equinoxlab.com

An Equinox Solutions Company



*Housing, Water And Sanitation (HWS) Survey Of Mumbai Slums.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help

1 : A.ii 22.01.2015 Visible: 144 of 144 Variables

	A.1	A.2	A.i	A.ii	A.iii	B	C	C.i	C.ii	C.iii	...	B2	B3	B4	...	B6	B7	B8	B9	B9.i	B10....	B10....	B10.1.3	B10.1.4	B10.2.1
1	1	1	1	22.01.2...	8.E+9	1	1	22.01.2015	11:30	Agarwadi	4	Indira Naga...	1	Mrs. Surek...	2	25	Ne...	3	3	.	1	3	0	3	
2	1	2	1	22.01.2...	8.E+9	1	1	22.01.2015	12:00	Indira Naga...	4	Indira Naga...	1	Aasha Sah...	2	38	Jan...	3	3	.	.	.	.	.	
3	1	3	1	22.01.2...	1.E+10	1	1	22.01.2015	12:35	Indira Naga...	4	Indira Naga...	1	Reshma S...	2	27	Ro...	3	3	.	1	3	0	3	
4	1	4	1	22.01.2...	.	1	1	22.01.2015	12:54	Agarwadi	4	Agarwadi	1	Anita Ram...	2	35	Ro...	2	2	1500	1	1	0	1	
5	1	5	1	22.01.2...	1.E+10	1	1	22.01.2015	1:05	Agarwadi	4	Agarwadi	1	Amita Kail...	2	30	Ro...	3	3	.	1	2	1	1	
6	1	6	1	22.01.2...	.	1	1	22.01.2015	1:30	Agarwadi	4	Agarwadi	1	Pushpa Aa...	2	45	Ro...	2	3	.	.	.	.	.	
7	1	7	1	22.01.2...	8.E+9	1	1	22.01.2015	2:05	Agarwadi	4	Agarwadi	2	Mrs. Deep...	2	23	Ro...	3	3	.	1	1	0	1	
8	1	8	1	22.01.2...	1.E+10	1	1	22.01.2015	2:30	Agarwadi	4	Agarwadi	1	Mrs. Heml...	2	63	Ro...	3	3	.	.	.	.	.	
9	1	9	1	22.01.2...	1.E+10	1	1	22.01.2015	3:00	Agarwadi	4	Agarwadi	1	Mamta Atu...	2	25	Ro...	3	3	.	1	2	0	2	
10	1	10	1	22.01.2...	9.E+9	1	1	22.01.2015	3:15	Agarwadi	4	Agarwadi	1	Khuraisa K...	2	38	Ro...	3	3	.	.	.	.	.	
11	1	11	1	22.01.2...	8.E+9	1	1	22.01.2015	3:45	Agarwadi	4	Deshmukh...	2	Vikranti Sa...	2	30	Ro...	2	2	2800	1	1	1	0	
12	1	12	1	22.01.2...	1.E+10	1	1	22.01.2015	4:15	Agarwadi	4	Agarwadi	2	Meena He...	2	37	Ro...	3	3	.	.	.	.	.	
13	1	13	1	23.01.2...	1.E+10	1	1	23.01.2015	10:15	Agarwadi	4	Imran Chaul	2	Savita Mar...	2	26	Ro...	2	2	1500	1	1	0	1	
14	1	14	1	23.01.2...	9.E+9	1	1	23.01.2015	10:50	Agarwadi	4	Sunder Bh...	1	Mrs. Bhavn...	2	48	Ro...	3	3	.	.	.	.	.	
15	1	15	1	23.01.2...	9.E+9	1	1	23.01.2015	1:05	Agarwadi	4	Bhau Chal ...	2	Pratibha N...	2	27	Ro...	2	2	3000	1	2	2	0	
16	1	16	1	23.01.2...	8.E+9	1	1	23.01.2015	11:16	Agarwadi	4	Bhau Patil ...	2	Mrs. Gauri ...	2	30	Ro...	2	2	900	1	1	1	0	
17	1	17	1	23.01.2...	25500101	1	1	23.01.2015	11:45	Agarwadi	4	Balkrishna ...	1	Mrs. Suvar...	2	43	Ro...	3	3	.	.	.	.	.	
18	1	18	1	23.01.2...	1.E+10	1	1	23.01.2015	12:00	Agarwadi	4	Balkrishna ...	1	Mrs. Suga...	2	66	Ro...	3	3	.	.	.	.	.	
19	1	19	1	23.01.2...	1.E+10	1	1	23.01.2015	12:30	Agarwadi	4	Kashinath ...	2	Jyoti Bask...	2	61	Ro...	2	2	100	.	.	.	.	
20	1	20	1	23.01.2...	1.E+10	1	1	23.01.2015	12:50	Agarwadi	4	Kashinath ...	2	Vaishali Patil	2	38	Ro...	2	2	200	.	.	.	.	
21	1	21	1	23.01.2...	1.E+10	1	1	23.01.2015	1:30	Agarwadi	4	Data Ram ...	1	Mrs. Vimal...	2	58	Ro...	3	3	.	1	1	1	0	
22	1	22	1	23.01.2...	1.E+10	1	1	23.01.2015	2:20	Agarwadi	4	Balaram P...	1	Mrs. Laxmi...	2	49	Ro...	3	3	.	1	1	0	1	
23	1	23	1	23.01.2...	1.E+10	1	1	23.01.2015	2:45	Agarwadi	4	Sawant Chal	1	Mrs. Praga...	2	52	Ro...	3	3	.	.	.	.	.	
24	1	24	1	23.01.2...	.	1	1	23.01.2015	3:00	Agarwadi	4	Baliram Pa...	1	Meena Sifij...	2	30	Ro...	3	3	.	1	1	1	0	

Data View | Variable View

IBM SPSS Statistics Processor is ready

12:19 11-02-2015

Overall observations in slums

- Public Toilet facilities in the slums are on paper – adequate; but practically just 10 % toilets are functional. Use is unsafe during nights for women. There is differential pricing for toilet. Open defecation is rampant and average waiting time for toilet in morning is 30-40 minutes. Majority needs to carry own water. About 10percent women reported to practice open defecation exclusively at night and child's stool is disposed of in open drain.

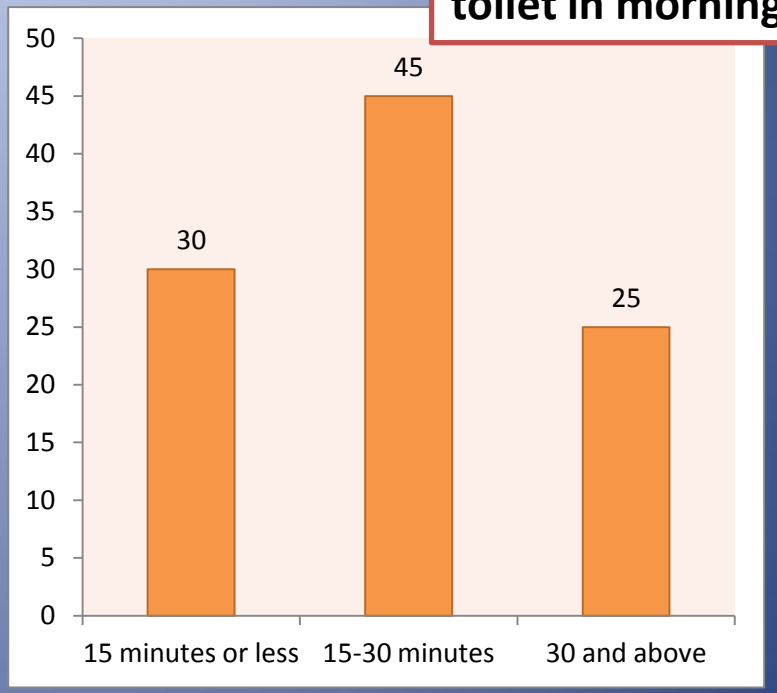
- BMC drinking water is available for 2 hours on an average. The water is stored in drums and cans. Some slums in hilly areas do not have any source of water., electricity, schools, public toilets. Corruption of forest officials are being practiced for years.

- Cylinder, kerosene stove and fuel wood are the main source for cooking. Kerosene are bought in black, waste- wooden furniture which are thrown out, are collected and used as fuel for cooking during unavailability of cylinder.

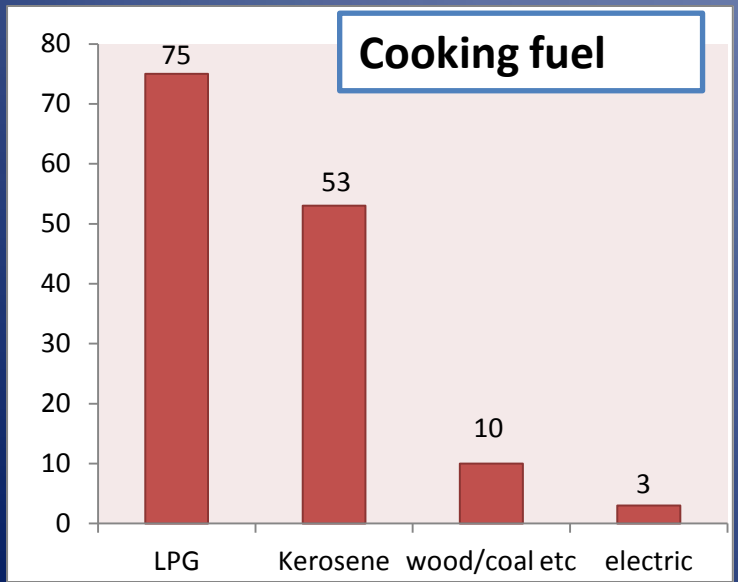
Based on 427 samples

Ownership of house and rent

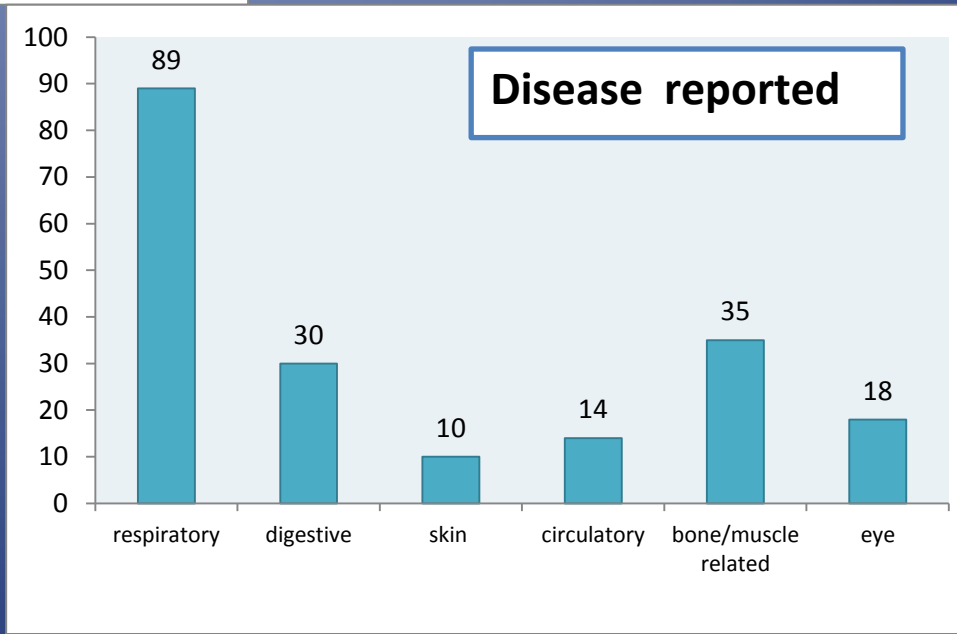
Waiting time for toilet in morning



Cooking fuel

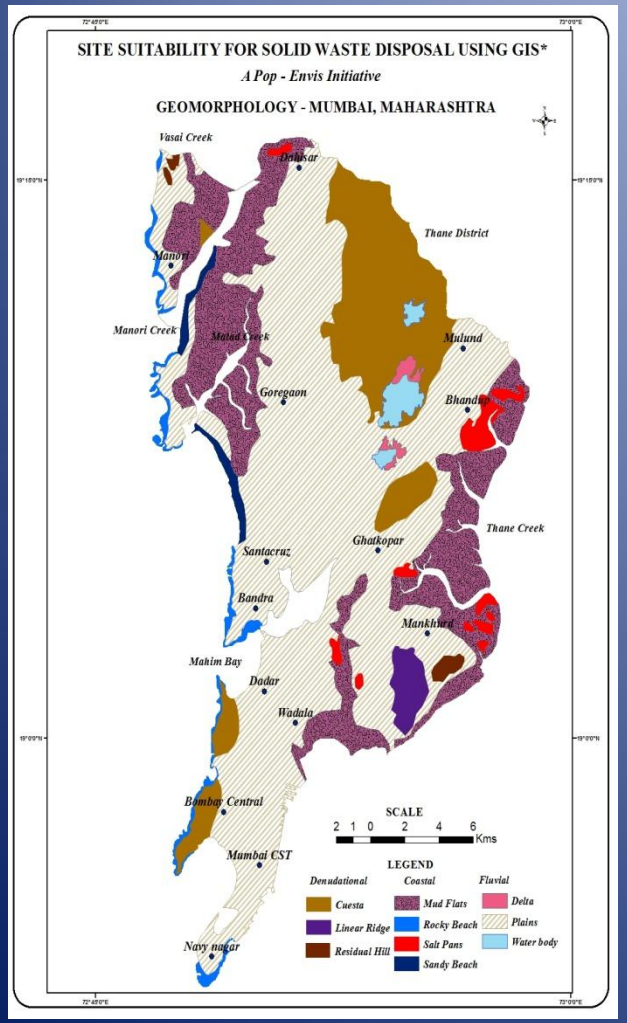


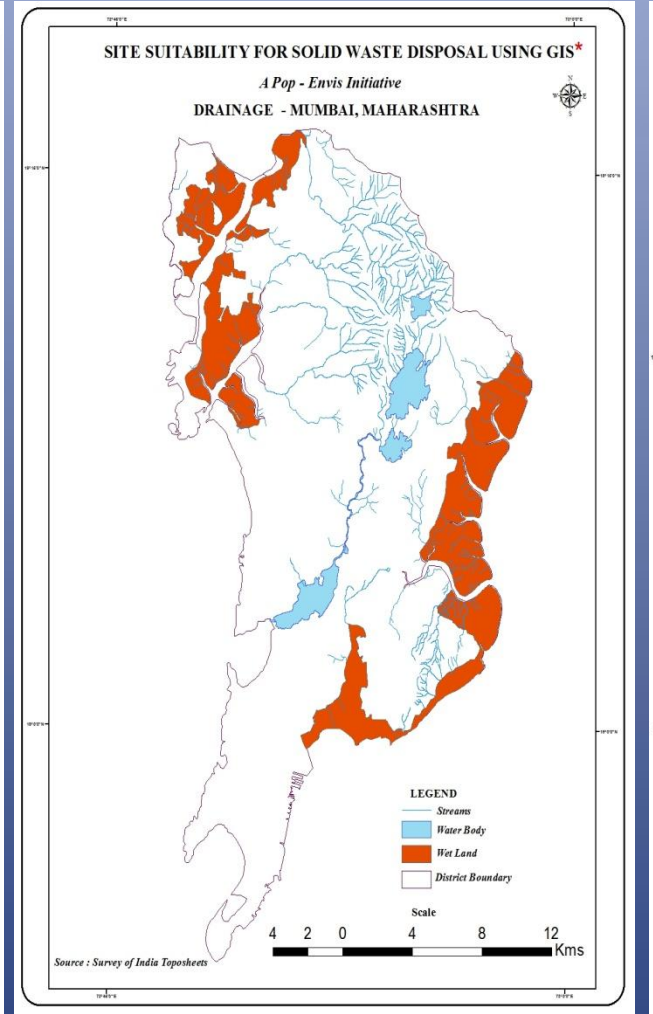
Disease reported

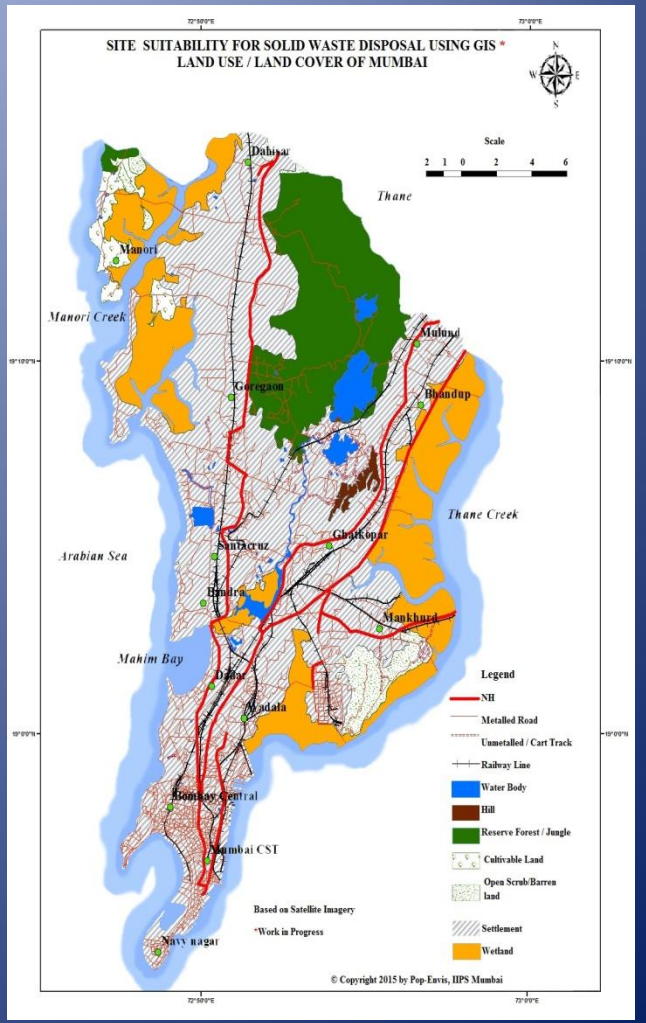


Knowledge dissemination, Literacy campaign and medical check up in slums areas

Solid waste disposal : site suitability analysis







Media coverage of Pop- Envis

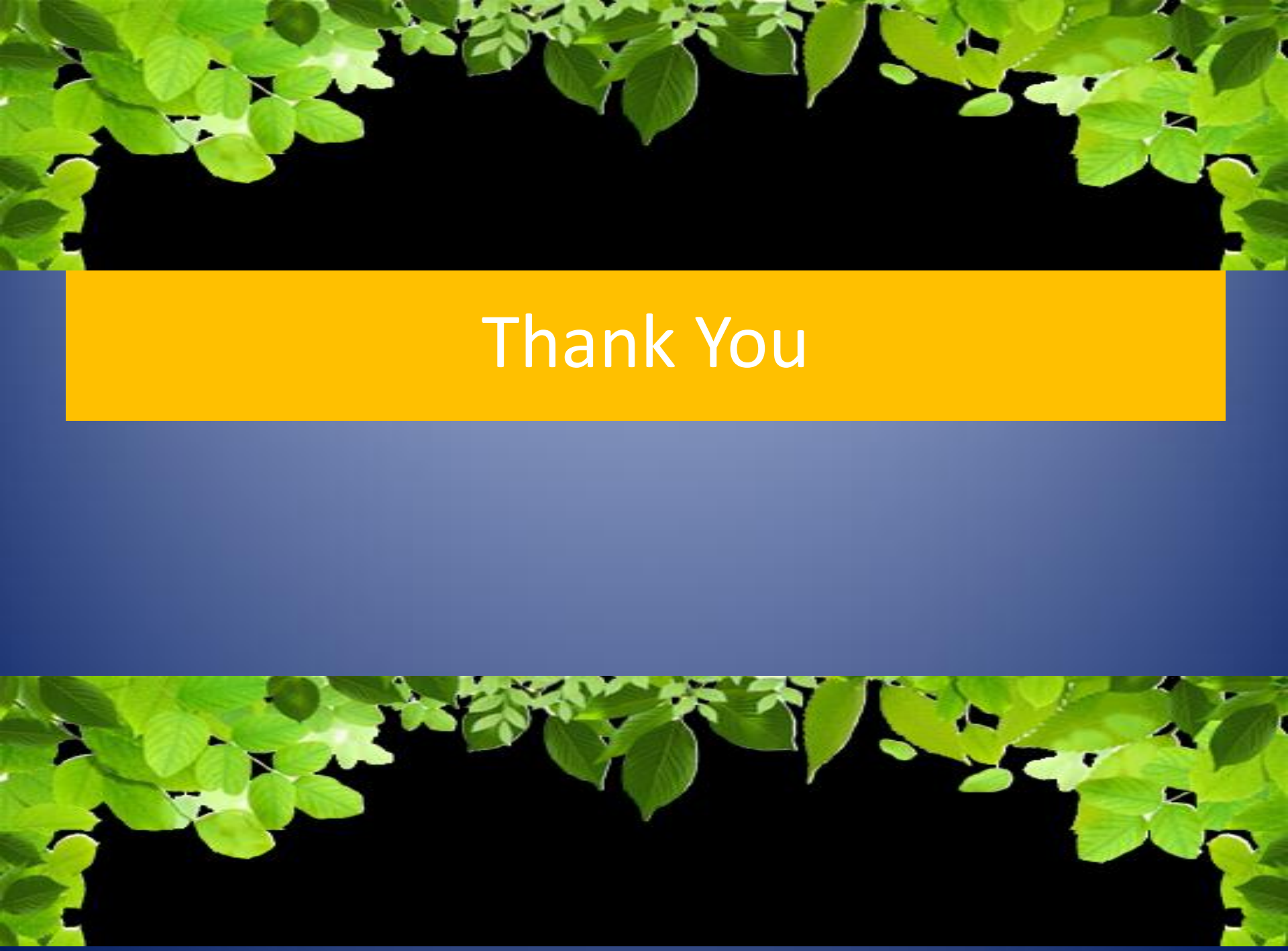
Data upload and web development

Major Section	*Upload in 2014-15*	No. Of Data Uploaded
Subject Area	***Population***	8
	Environment and Health	3
	Natural Resource	5
	Transport & Communication	4
	Solid Waste	1
	Family Health Survey	6
	Agriculture	3
	Graphical representation	11
	Urbanisation	4
	Wild life	1
Publication	***Newsletter***	2
	Books and Relevant Link	2
	Policy Brief	3
	Published Paper and articles	10
	JSTOR (Digital Library)	5
Kids section, Major activities, Upcoming events	***Regular update***	

Proposed Objectives for 2015-16

Major agenda: 2015-16

1. Site suitability analysis of waste disposal (in continuation)
2. HWS survey in Rural Maharashtra
3. Knowledge dissemination in Slums (in continuation)
4. Report publication on HWS survey in Mumbai slums
5. Press meeting on POP- ENVIS activities
6. Workshops/ interaction with local schools
7. ENVIS bulletin and policy brief
8. Web development


Thank You