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Capacity Building for a Better Future

प्रकृतिः रक्षति रक्षिता
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ENVIS TEAM

Faujdar Ram	Director IIPS
Dhananjay W. Bansod	ENVIS Coordinator
Aparajita Chattopadhyay	ENVIS Coordinator
Chandrakala Ramnayan	Programme Officer
Sudha G	Information Officer

PUBLISHED BY

Envis Centre on Population, Human Settlement and Environment (Pop-Envis)

International Institute for Population Sciences
(Deemed University)
Denoar, Mumbai, Maharashtra - 400 088
Ph.No. 022-42372496, 417, 756
Fax No. 022-25563257
Email: popenvis@iips.net
Website:
www.iipsenvis.nic.in

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From Editor's Desk.....

Greetings !!!

This issue of directions was received with interest by the entire Institute community. We, as the editorial team, are extremely grateful for your warm words of encouragement. We believe that this newsletter (Population & Environment Bulletin) is of all, for all and by all. Thus, we seek the participation of every member of the Institute and other research communities. We will be approaching you in the near future, if we haven't already done so, for sharing the pleasure of making the newsletter, an experience that is satisfying. Please do your bit . . . it will be a great help!! DO call us and discuss what the next issue would be, and you can pitch-in your bit.

This issue brings to you some thoughts on understanding the dynamics of residential fuel use and health risk in India and some new initiatives of Pop-Envis, eventually leading to new directions into which the Pop-Envis will surge ahead in the years to come.

Come let us make small efforts in strengthening Pop-Envis, which was initiated for sowing, cultivating and harvesting knowledge. Let us till this land again today and rejuvenate its power to produce knowledge that is . . . new, authentic, and meaningful!! Happy reading...

Editor
(Dhananjay W. Bansod) dhananjay@iips.net

Editorial Assistance: Mrs. Sudha G.

CONTENTS

Understanding the Dynamics of Residential Fuel Use and Health Risk in India and Major States

Kaveri Patil, Ph.D student, IIPS, kaveripatil26@gmail.com

Introduction:

"The significance of energy for development appears to be greatest in those countries that have the lowest aggregate levels of energy consumption and where energy use is inefficient"(UNDP and WEC 2000). Two Asian countries, India and China, account for around forty percent of the world's population, but less than twenty percent of the world's primary energy use. Global primary energy demand is projected to increase by 50% between 2005 and 2030. Almost 45% of this increase will be in China and India alone (IEA, 2007). Yet, despite their formidable growth, poverty and lack of access to sufficient amount of clean and efficient energy sources to meet complete demand remain serious concerns and a challenge in countries.

The household sector is one of the largest users of energy in India, accounting for 40% to 50% of the total energy consumption excluding energy used for transport, reflecting the importance of that sector in total national energy scenario (Teddy, 2002-03 and Reddy, 2003). Throughout the past few decades, several changes have experienced by India in its household fuel consumption patterns; both in terms of quantitative and qualitative (CMIE, 2001). This is because of the natural increase based on population growth and due to the increase of economic activity and development.

It is estimated that globally more than three billion people currently rely on solid fuels, of which 2.4 billion use biomass fuels while the rest are dependent on coal. Access to modern energy sources is a necessary requirement for economic and social development (IEA, 2002). A large portion of the world's population still does not have access to modern energy sources, mainly due to low income and the lack of availability of alternative and modern fuels. Residential energy use in developing countries varies mostly from rural and urban areas and high and low income groups (Ruijven et al., 2008).

Indoor air pollution (IAP) is a major concern for both developed and developing countries. Particularly due to high use of solid fuels which is a major source of IAP in developing countries. Biomass refers to any plant or animal based material burned by humans, mainly for cooking, lighting and heating in homes. It includes wood, charcoal, agricultural residues and dung which continue to be a dominant source of cooking energy in India. The National Family Health Survey for 2005–2006, NFHS-3 (IIPS, 2007) estimated that indoor air pollution accounts for one-third of AIR cases and that ARI accounts for up to 20 percent of deaths among children under age five.

Solid fuels are responsible for causing several adverse health effects on the population. Biomass burn incompletely, thus releasing, in addition to carbon dioxide, a multitude of complex chemicals, including suspended particulate matter (SPM), carbon monoxide, formaldehyde, nitrogen dioxide, ozone and polycyclic aromatic hydrocarbons (PAH). They are mostly burnt in open fires or in three-stone stoves, leading to release high levels of harmful chemicals. Exposure to these substances leads to increased risk of a variety of diseases, including pneumonia, chronic respiratory diseases and lung cancer (Bruce N et al., 2002). The effect on health due to exposure to biomass smoke can be determined by the duration of exposure along with the air concentration of each pollutant (pollution level*time). It can be measured in units of person-hour of exposure and measured directly through personal monitoring or indirectly through information on pollutant concentration and activity patterns *(Naeher, L.P et al., 2001)*. Direct measures are more reliable than indirect measurement, but costly, so many estimates around the World are based on indirect measures.

The amount of fuel burnt individually at the household level may be much less than the amount in use in industries, and may therefore contribute less to ambient air pollution; however, its impact on health is greater due to its presence in the indoor environment and the greater amount of time spent indoors with humans. The two million estimated deaths due to air pollution 1.2 million are attributed to IAP (WHO, 2002). Moreover, women and young children in developing countries are at greatest risk because of their gender roles and household responsibilities and behaviours – cooking and spending lots of time indoors and keeping children with them while cooking – have a higher risk of IAP. In addition, children are particularly vulnerable to IAP because their metabolic pathways are underdeveloped and immature and they are not able to get completely free of the IAP compounds from their body.

The greater time needed for gathering, transporting and using these fuels also reduces the ability for using this time in more fruitful work or education. In addition, as women and children are more likely to suffer from many of these adverse effects, the issue has an important gender and equity aspect (Pachauri, 2004a).

Objectives:

1. To understand the differentials of household energy use pattern by fuel type for cooking and lighting.
2. To determine the influencing factors for choosing household fuels for cooking and lighting.
3. To determine the linkages between household energy use and various respiratory diseases.

Hypothesis:

H1: Kitchen smoke and cooking practices have no health impact

Data and methodology:

This paper is constructs on the India Human Development Survey 2005 (IHDS). IHDS is a nationally representative survey of 41,554 households in 1503 villages and 971 urban neighbourhoods across India (IHDS, 2005). In order to know the level of inequality in living standards of population or proportion living in poverty, IHDS survey data, calculate monthly per capita expenditure (MPCE) by using consumption expenditure of goods and services and also have detailed questions on household income by sectors and independently for each household member. So we have one variable of INCOME. Then splitting this data into 20 consumers groups- labelled: Q1-Q2 for rural and urban population separately, with income rising with the group number- consisting of expenditure deciles for the urban and rural populations are being done. Cross tabulation is applied for the analysis.

To establish a linkage of health with kitchen smoke and cooking practices, it is necessary to see whether the smoke from use of biofuels and cooking practices have statistically significant impact on health or not. The linkage is established using Z test and χ^2 test of significance. The formula used for Z test is, $Z = \frac{(p1 - p2)}{\sqrt{p(1 - p) * \frac{(n1 + n2)}{(n1 * n2)}}}$, where p1 and P2 are two different proportions out of two sub- samples n1 and n2, and $p = \frac{n_1 p_1 + n_2 p_2}{n_1 + n_2}$ Z follows normal distribution with mean zero and standard deviation 1. At 95 percent confidence level the significant value of Z is 1.96. If the calculated value of Z is greater than the significant value, null hypothesis that kitchen smoke and cooking practices have no health impact are rejected. Prevalence ratio has been calculated as the ratio between P_1 and P_2.

Results and discussion:

Household Characteristics and Fuel Use Pattern:

Total 41554 households were surveyed for Indian Human Development Survey (IHDS-2005). Almost half of all households use at least three different fuels at different times, or for different purposes. It is not uncommon, for instance, for a cook to rely primarily on firewood for cooking the

main meals, to use a fuel like LPG or kerosene for quickly making tea, and to use dung cakes in the slow heat needed to simmer fodder for animals, or heat milk. The IHDS captured this variety by asking about each type of fuel used independently. The results show that fuel wood is the main source of cooking fuel. Only 24.41 percent (24639-14592) of the households was using clean fuels, like kerosene or liquid petroleum gas for cooking, whereas 35 percent (14592) were using the combination of fuel such as biomass (firewood, dung cake and crop residues) and clean fuel (**Figure 1**). Around 40.13 percent (31113-14592) households were using only biomass fuel for daily cooking.

The use of kerosene and LPG is greater in urban than in rural areas (**Figure 2**). Almost all urban households (89 percent) use some modern fuel for part of their cooking, and the majority (65 percent) does not use biomass fuels at all. In rural areas, the reverse is true. Almost all (93 percent) use some form of biomass fuel for cooking, and the majority (55 per cent) does not use modern fuels at all.

Figure 1: Distribution of Household by Type of Fuel Use, 2005

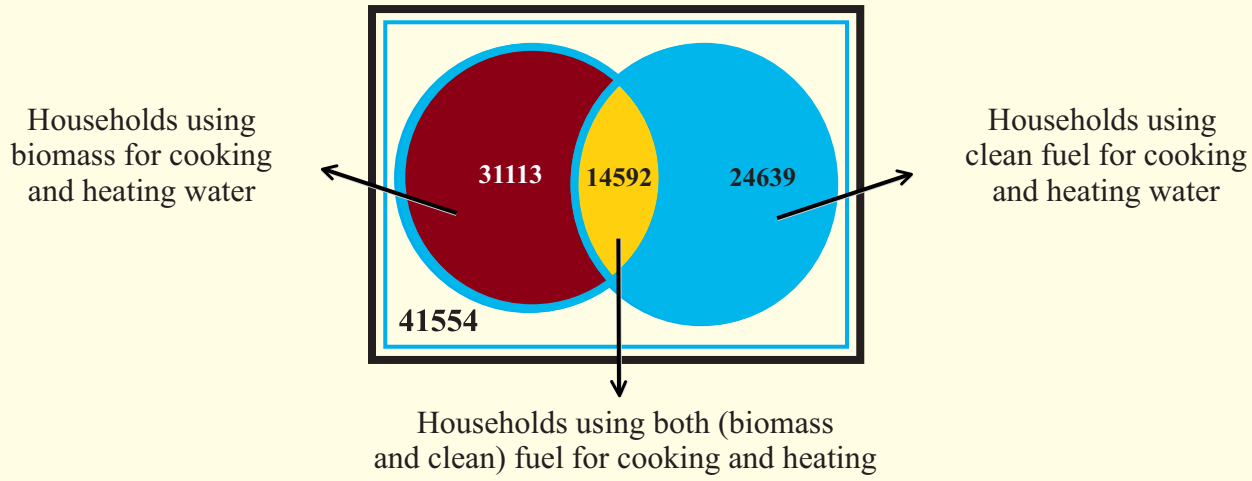


Figure 2: Percent Distribution of Household by Fuel Type, Urban-Rural Separately, 2004-05.

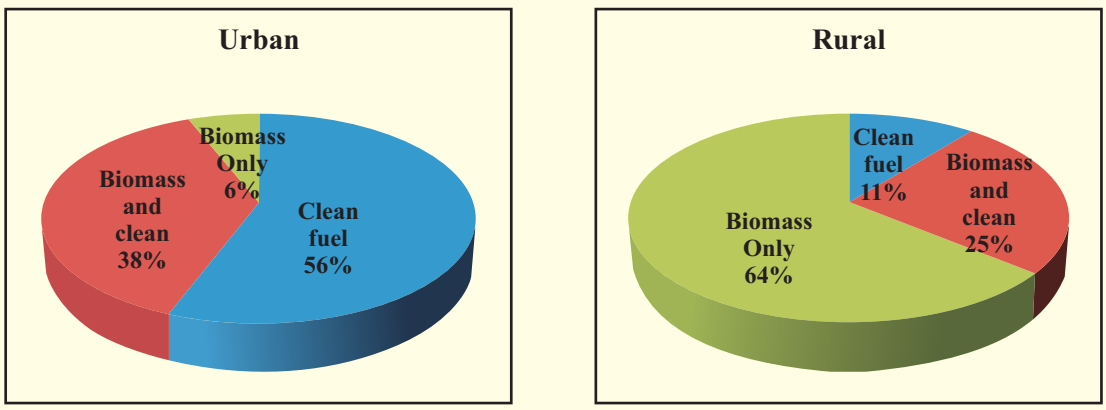
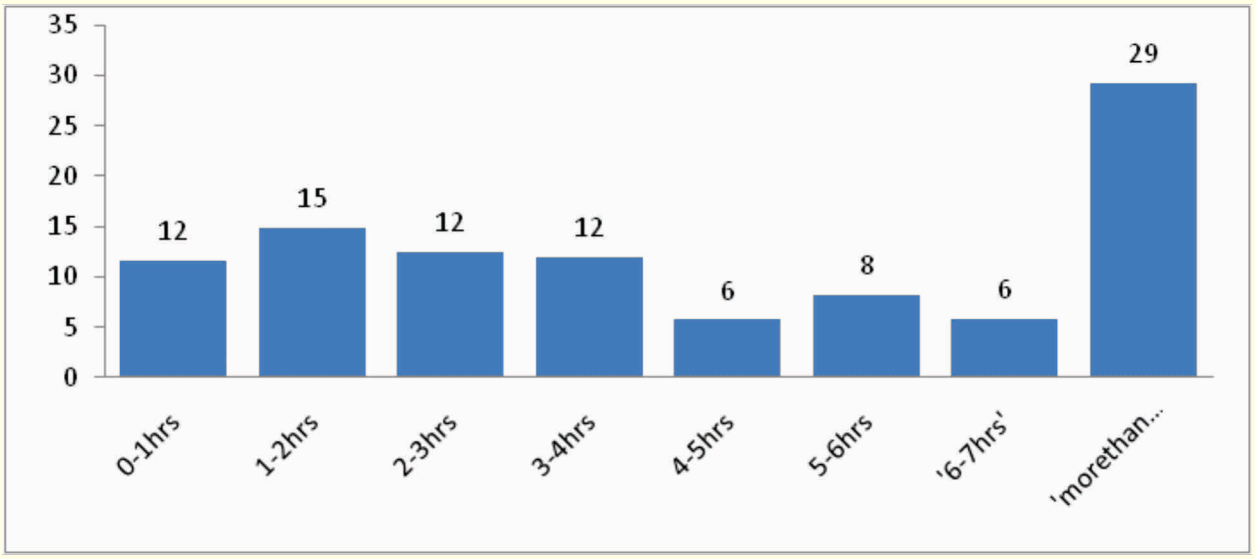


Figure 3: Total Time Spent in Collection of Fuel-Wood by Household Members in a Week



By adding the time spent by woman, men, girls and boys in a same household in collection of fuel by household called as total time spent. Figure 3 showed that 29 percent households spent more than 7 hours a week in collection of fuel; around 20 percent household spent 4-7 hours a week. Women and female children are involved in the collection and transportation of fuel-wood. Imagine the time required for gathering and transporting the fuel. Hence, they could not involve in any productive work to enhance their economic status.

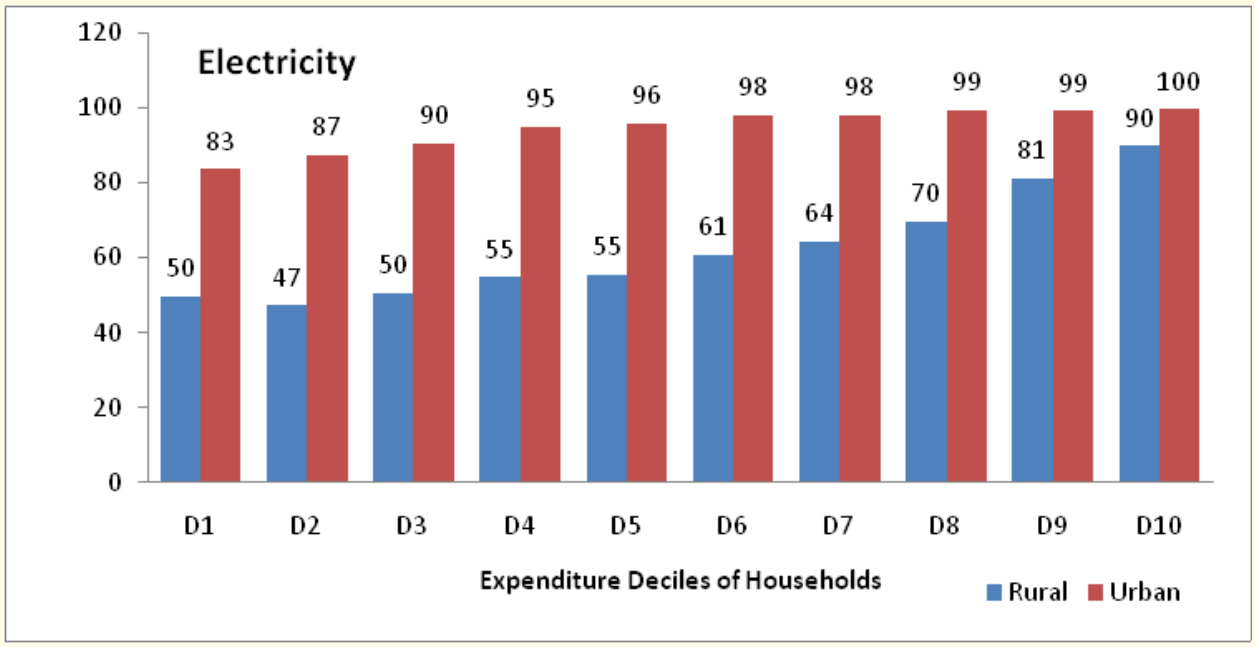
Table 1: Distribution of Households by Having Electricity Connection and Hours of Electricity Available in India, 2005

	Rural	Urban	Total
No electricity connection	36.72	5.05	27.92
Having electricity connection	62.29	94.63	71.28
Total	100.00	100.00	100.00
Zero hrs	7.44	0.76	5.08
1-5hrs	8.12	3.70	6.56
6-10hrs	22.65	11.29	18.63
11-15hrs	13.87	7.56	11.64
16-20hrs	27.13	24.93	26.35
20-24hrs	20.79	51.76	31.75
Total	100.00	100.00	100.00

In India around 71 percent of households are having electricity connections. Among 71 %, 62.29 percent are from rural households and around 95 percent of urban households are connected with electricity (table 1). But if we see the availability of electricity hours, then we realise that only having connection does not matter for rural households. Load shading hours are much more hours for rural areas as comparable to urban. Inadequate supply is a bigger problem

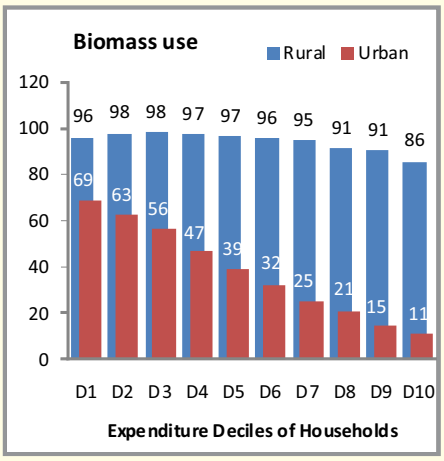
for rural households. Only 6 percent have steady 24 hour electricity, another 26 percent have only twelve or fewer hours, and about 37 percent do not have any electricity service. Only 21 percent of rural households reported 20-24 hours of electricity as compared to 52 percent of urban households.

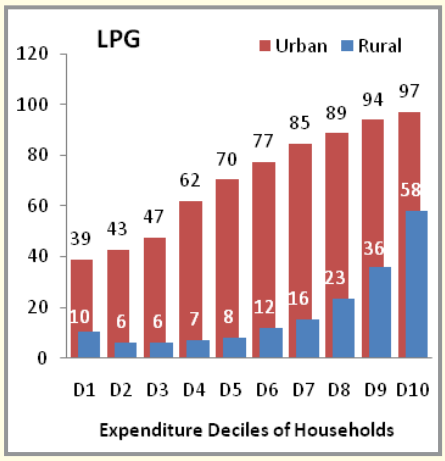
Figure 4: Electricity by Income Levels and Place of Residence



IHDS finds that the rural poor are less likely to have electricity, than rich household (see Figure 4). Around 50 percent of lower rural decile (D1) doesn't have access to electricity as compared to highest rural decile (D10) where only 10 percent of households don't have access to electricity. Around 95 percent to 100 percent of all urban deciles have electricity.

Figure 5: Biomass and LPG Fuel by Income Levels and Place of Residence



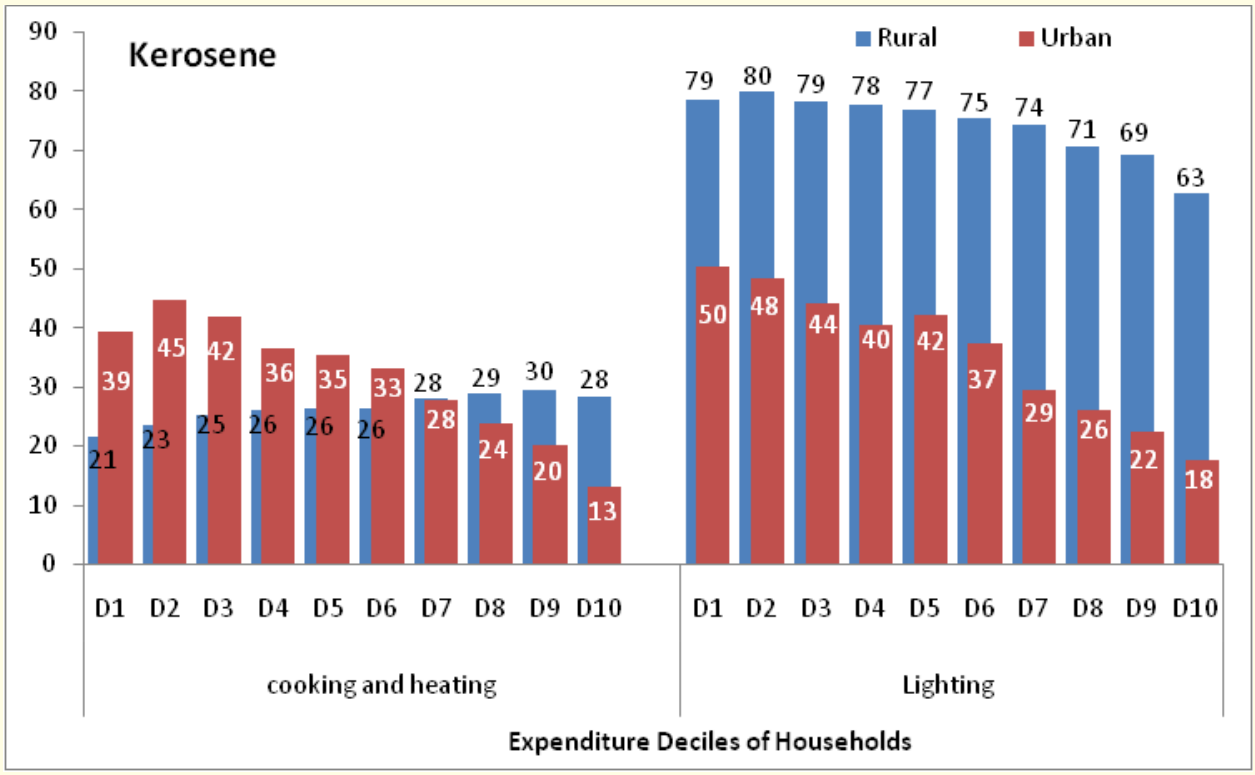


Around 90 percent of rural and 44 percent of urban households rely on biomass fuel (Figure 2). **Figure 5 (biomass),** shows that as income increases use of biomass fuel for cooking and heating

decreases. But it is true only in urban areas. In rural area, biomass fuel is easily and freely available. Along with this there are some cultural and social practices which restrict the rich households to use clean fuel. The use of LPG for cooking is positively related to income of households **(figure 5,** LPG). Only 10 percent of rural households from lowest decile (D1) use LPG and it varies up to 58 percent of highest decile households.

The distributions of kerosene have divided into two categories; one is mainly for cooking and another is mainly for lighting. Distributing these categories by income group and place of residence it clearly shows that **(figure 6)**; in rural areas kerosene is used more for lighting than cooking. But the scenario of urban area is different; around 40 -45% of lower decile households are using kerosene for cooking as compared to less than 15% for highest decile. As income increases use of kerosene for lighting as well as cooking decreases among the urban household, but is not strongly shows for rural area.

Figure 6: Biomass and LPG fuel by Income Levels and Place of Residence



Health Impact: five self-reported respiratory diseases are considered such as cough, cough with short breath, asthma, tuberculosis and cataract. On the basis of these diseases, positive linkage of respiratory problems, particularly cough, cough with short breath, asthma and tuberculosis have

been observed at a broader level with the use of biomass fuel. These cases have been found significantly higher among those using biofuels as compared to those using clean fuels. Clean fuel and biomass fuel users are mutually exclusive to compare.

The prevalence ratios of cough for biomass fuel users compared to clean fuel users are higher by a factor of 2.36 and for eye, tuberculosis it is 2.14. Cataract does not have as much difference between clean fuel and biomass fuel it is 1.36 because the cataract is very common in older age (Table 2. A). If we compare the use of any biomass fuel and combination of both clean fuel and biomass fuel; it also shows significant differences. Among the both categories, mainly household uses clean fuel for cooking and biomass fuel for heating water. Results of (Table 2.B) reveal that those members who are using only biomass fuel have very high risk of developing respiratory diseases like cough, short breath and even tuberculosis. Cataracts do not show a significant relationship to type of fuel used.

Self-reported symptomatic cases of respiratory diseases like cough, cough with short breath, asthma and tuberculosis also found to be significantly higher among those who cook indoors as compared to those who cook in the open air. This is due to higher exposure to smoke in case of indoor cooking as compared to that of open air cooking. The results are presented in (Table 2C) which reveals that exposure to biofuels smoke has significant health impact. Type of house and involvement in cooking is also a significant variable as far as respiratory diseases are concerned. The prevalence of respiratory diseases is significantly higher for those who cook indoors.

Table 2: Linkages between Type of Fuel Use and Diseases

Fuel used	Total members	Symptoms reported (per cent)				
		cough	cough with short breath	asthma	tuberculosis	cataract
A. Respiratory diseases in household using only biomass and clean fuel						
Any Biomass fuel (n1)	89398	3.33	3.24	1.25	0.76	1.4
Clean fuel	46212	1.41	1.6	0.36	0.25	0.45
Z-value		4.04	3.66	2.12	2.36	1.85
Prevalence ratio		2.36	2.03	2.04	2.14	1.36
B. Respiratory diseases in household using only biomass and combination of both (clean and biomass)						
Any Biomass fuel (n1)	89398	3.33	3.24	1.25	0.76	1.4

Both (clean and biomass) fuel	80144	1.6	1.9	0.45	0.30	0.56
Z-value		3.9	3.16	1.99	2.14	1.76
Prevalence ratio		2.09	3.16	1.09	1.25	1.23
C. **Indoor cooking (vs) outdoor cooking**						
Indoor cooking and disease		17686	7984	1271	713	1331
Indoor cooking but no disease		23440	33142	39855	40413	39795
Open air cooking and disease		1125	856	526		648
Open air cooking but no disease		40603	40872	41202	41728	41080
Calculated X^2 value		6.7550	6.0576	3.8027	7.0828	4.42

Self-reported symptomatic cases of respiratory diseases like cough, cough with short breath, asthma and tuberculosis also found to be significantly higher among those who cook indoors as compared to those who cook in the open air. This is due to higher exposure to smoke in case of indoor cooking as compared to that of open air cooking. The results are presented in (Table 2.C) which reveals that exposure to biofuels smoke has significant health impact. Type of house and involvement in cooking is also a significant variable as far as respiratory diseases are concerned. The prevalence of respiratory diseases is significantly higher for those who cook indoors.

Conclusion:

The present paper highlights the socio-economic characteristics, fuel consumption pattern and health profile. Provision of clean and affordable energy for poor households in developing countries is an important requirement to fight against poverty. Bio fuels are the main source of cooking for about 95 percent of rural households. Use of dung cake is not very common in rural area. The average time spent to collect wood is about 5 hours in a week by each household. Kerosene is mostly used for lighting. This is reflected by a very small amount of kerosene consumed per households. Nearly 43 percent households own kerosene pressure stoves. However, they do not get kerosene for their use. 71 percent households are connected with electricity. Though 90% richer households are using biomass fuel for cooking due to the availability of clean fuels viz., kerosene and LPG is not sufficient in the area. Even in the households where kerosene is used for cooking, its use is restricted from making small meals or snacks. The reason for its restricted use is mainly non-affordability and unavailability. The rural population has no other option but to use biofuels due to non-availability of kerosene. The demand can be tapped to reduce health impacts and drudgery of women.

The linkages of health with bio fuel use were also established on the basis of reported respiratory diseases. The cough, cough with short breath, asthma and tuberculosis, are significantly higher in the case of households using biomass fuels than the households using clean fuel (LPG and kerosene). Cataract is also found to be significantly high in bio fuel user households. The respiratory symptoms are significantly higher in biofuels using households who cook indoors than those who cook outdoors.

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Kisan Diwas

Kisan Diwas (Farmer's Day) is celebrated every year on 23rd December to celebrate the birth anniversary of the fifth prime minister and kisan leader, Late. Chaudhary Charan Singh. As part of Kisan Diwas (Farmer's Day), 23rd Dec, 2015, pop-envis conducted competitions for school children's and for students and staff members of IIPS. The principle objective of this competition was to create knowledge and capacity building for students on the importance of farmers and agriculture. Competitions such as drawing for class 3 on "***Save Agriculture***", poetry for class 4 on "***Save Environment for Food***", essay writing for class 5 on "***Save Agriculture***" and collage work for class 6 on "***Save Land, save farmers or Green Farming***" were conducted. Around 80 Students from L.V.A Sarvodaya Vidyalaya and Swami Ramakrishna Paramahans English School were participated in the competition.

For students and staff members of IIPS competitions such as drawing, poetry, essay writing and photography were conducted on the broad theme "***Environment - Agriculture – Farmer - Food".*** Around 11 students and staff members of IIPS were participated in the competition.

Students of Swami Ramakrishna Paramahans English High School, Govandi, Mumbai.

Students of L.V.A Sarvodaya Vidyalaya, Govandi, Mumbai.

Collage Work

1st Prize : Kunj D. Darj, 6th std. , Shri L.V.A Sarvodaya Vidyalaya

2nd Prize: Lokash M. Bhandari; , 6th std. , Shri L.V.A Sarvodaya Vidyalaya

Drawing

1st Prize: Leena Tanisha Arunlal, 3rd std., Swami Ramakrishna Paramahans High School

Consolation Prize: Parth Yadav , 3rd std., Swami Ramakrishna Paramahans High School

Art By: Sikarwar Ankit Kumar, IIPS

Art By: Devarupa Gupta, IIPS

Photography

Picture Courtesy: Kacho Amir Khan, IIPS

The above two photographs were taken from village Shargole, Kargil district of Ladakh region during the month of March. The photographs highlight the subsistence farming practiced in the cold desert of Ladakh with the help of dzo (hybrid Yak) but now it has been replaced by the tractor, organic manure by chemical fertilisers, and indigenous crops by vegetables for the tourist market. The whole system of agriculture has changed.

Picture (A) *shows a farmer washing his cattle in a common pond. Most of these scenes can be seen in morning because remaining time they will be in Agricultural fields.*

Picture (B) *shows a farmer sorting out paddy through traditional method*

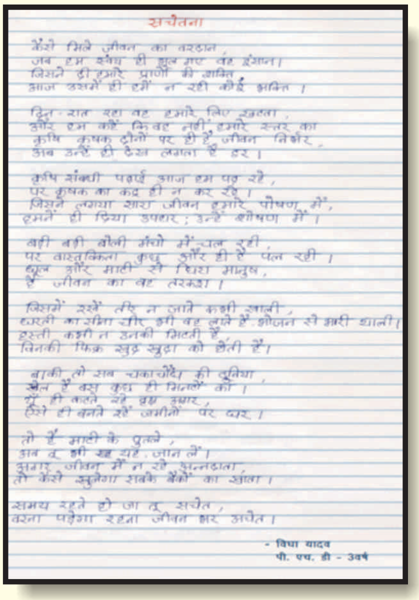
Picture Courtesy: I.V.Prasad, M.A/M.Sc, IIPS

The above two photographs were taken in a village called 'Yanamadala', East Godavari District of Andhra Pradesh. Most of the people depend on agriculture and allied activities as their livelihood.

Gradually, these beautiful scenes becoming a picture in children stories due to farmers suicides, migration and other major reasons. Farmers started migrating to nearby towns for searching new livelihood as they face severe problems in agriculture. As well as the new generation are more interested in jobs in cities than in agriculture. Those above situations are becoming more common in this village 'Yanamadala '.

The following few lines show the urgency to save farmers lives and to protect our nation. "The number of farmer suicides has touched 2,016 by September end in 2015, according to data released by the Maharashtra state government." Maharashtra has been topping the list of states in the country when it comes to farmers committing suicide. -The Indian Express (November 12, 2015).

Poetry



सचेतना

कैसे मिले जीवन का वरदान,
जब हम स्वयं ही भूल गए वह इंसान।
जिसने दी हमारे प्राणों को शक्ति,
आज उसमें ही हमें न रही कोई भक्ति।

दिन-रात रहा वह हमारे लिए खटता,
और हम कहें कि वह नहीं हमारे स्तर का
कृषि कृषक दोनों पर ही हैं जीवन निर्भर,
अब उन्हें ही देख लगता है डर।

कृषि संबंधी पढ़ाई आज हम पढ़ रहे,
पर कृषक का कद्र ही न कर रहे।
जिसने लगाया सारा जीवन हमारे पोषण में,
हमने ही दिया उपहार; उन्हें शोषण में।

बड़ी बड़ी बोली मंचो में चल रही,
पर वास्तविकता कुछ और ही है पल रही।
धूल और माटी से घिरा मानुष,
है जीवन का वह तरकश।

जिसमें रहें तीर न जाते कभी खाली,
धरती का सीना चीर भी वह लाते हैं भोजन से भरी थाली।
हस्ती कभी न उनकी मिटती है,
जिनकी फिक्र खुद खुदा को होती है।

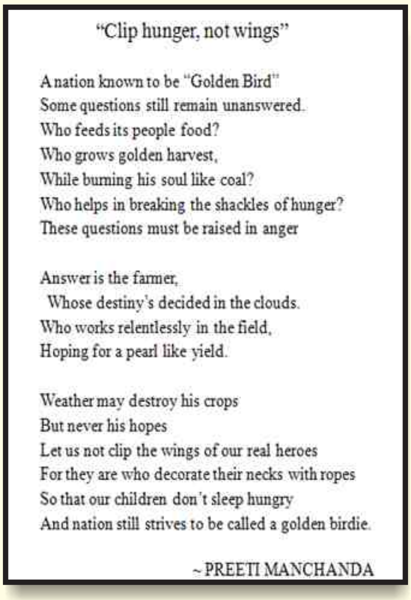
बाकी तो सब चकाचौंध की दुनिया,
खेल हैं बस कुछ ही मिनटों का।
यूँ ही ढहते रहे इस प्रकार,
ऐसे ही बनते रहें जमीनों पर घर।

तो हे माटी के पुतले,
अब तू भी सब यह जान लें।
अगर जीवन में न रहे अन्नदाता,
तो कैसे खुलेगा सबके बैंकों का खाता।

समय रहते हो जा तू सचेत,
वरना पड़ेगा रहना जीवन भर अचेत।

- विद्या यादव
पी. एच. डी - 3वर्ष

Vidya Yadav, IIPS



"Clip hunger, not wings"

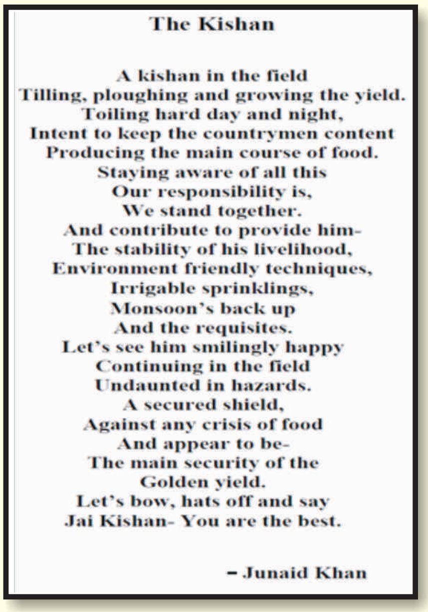
A nation known to be "Golden Bird"
Some questions still remain unanswered.
Who feeds its people food?
Who grows golden harvest,
While burning his soul like coal?
Who helps in breaking the shackles of hunger?
These questions must be raised in anger

Answer is the farmer,
Whose destiny's decided in the clouds.
Who works relentlessly in the field,
Hoping for a pearl like yield.

Weather may destroy his crops
But never his hopes
Let us not clip the wings of our real heroes
For they are who decorate their necks with ropes
So that our children don't sleep hungry
And nation still strives to be called a golden birdie.

~ PREETI MANCHANDA

Preeti Manchanda, IIPS



The Kishan

A kishan in the field
Tilling, ploughing and growing the yield.
Toiling hard day and night,
Intent to keep the countrymen content
Producing the main course of food.
Staying aware of all this
Our responsibility is,
We stand together.
And contribute to provide him-
The stability of his livelihood,
Environment friendly techniques,
Irrigable sprinklings,
Monsoon's back up
And the requisites.
Let's see him smilingly happy
Continuing in the field
Undaunted in hazards.
A secured shield,
Against any crisis of food
And appear to be-
The main security of the
Golden yield.
Let's bow, hats off and say
Jai Kishan- You are the best.

– Junaid Khan

Junaid Khan, IIPS

Essay: Environment- Agriculture- Farmer- Food

Junaid Khan, Ph.D Scholar IIPS

Since after independence, our country has made immense progress towards food security based solely on agriculture leading to stable economic growth. Much more progress needs to be made in the process of achieving higher rates of economic growth by vibrant agricultural activities. We have to make the best use of the potential and performance of agriculture and ensure that this trend does not suffer any kind of stagnation.

In order to put this mission into effect, we must lend adequate support to the farmers (kishans) of our country by laying the favourable conditions for them to reap agricultural production in abundance. With vast area of arable land and temperate climate, our country is richly endowed by nature for agriculture and production. Arable land out of the total 328 million hectares of land area of our country is 51 percent against the world average of only 11 percent. Irrigation infrastructure of our country includes a network of major and minor canals from the rivers, wells, tanks and other rain water harvesting projects for agricultural activities. In addition to that we have the scope to make the best use of rain water during monsoon. If half of the average rainfall is received, preserved and delivered to fields, our entire cultivable land can produce two crops a year. On the other hand, temperate climate of our country enables us to grow crops throughout the year. The matter of fact is that we are not fully utilising our natural resources. There is incidence of more than 38 million hectares of our land area though cultivable, being left uncultivable and classified as 'cultivable waste land' and what is interesting is that this 38 hectares of land area is more than the total cultivated area of 4 countries viz. Nepal, Bangladesh, Pakistan and Japan.

There is no doubt that we have been able to increase the food grain production by leaps and bounds by sophisticated cultivating methods and have made there by substantial increase in available food grain per capita. Still we do not have made any scope to rest in complacency because of the fact that our productivity per hectare of most crops is much less than the world average and less than half of those already achieved in agriculturally advanced countries. We should always keep it in mind that higher productivity is the strongest way to reduce incidence of poverty. We get to see the clear evidence of minimum incidence of poverty in the states of Punjab and Haryana due to it's per hectare yields being highest in India. Whereas, Maharashtra said to be the most industrialised state has much higher incidence of poverty.

We are all aware of the fact that it is the Kishans of any country who make and mark the future of that country and therefore it is required to ensure that they do not have to suffer any feeling of discontentment due to financial distress for no fault of their own. The long persisting adverse terms of trade should come to an end so as to enable them to be self-sufficient. Parity is to be put into place in respect of the prices of farm out puts and farm inputs; else it will lead to poor capital information and stagnation in farm sector. Minimum support prices of the crops particularly of wheat and paddy need to be judiciously fixed to prevent incidence of any situation leading to a Kishan seen to be paying a higher level of prices for his purchases that what he has been receiving by sale of his produce. We have to ensure that welfare and wellbeing of the Kishans is safe guarded for the sake to the golden agriculture under a much more developed, comprehensive and sustained agriculture programme.

It would be pertinent to mention here in the context of what is stated above that our country is burdened with the population of 1210 million as per census 2011 and that there is no farther scope for expansion of agricultural land after large scale forest areas, pasture-lands and waste lands have already been converted to cultivating land to support the rising population. As a result of which ecological imbalance and atmospheric pollution have take place.

In face of the situation arising out of the facts as aforesaid, the science of agriculture needs to evolve a most effective type of agriculture maintaining a good imbalance in combination of various agricultural techniques to make it easy for the environment to be congenial for a good quality of agriculture, adequate food grains for healthy survival of the entire population showing in the backdrop a beautiful landscape wherein we get to see the Kishans rejoicing with broad smile on their faces.

Valedictory Session

Dr. Dhananjay W. Bansod, Pop-Envis Coordinator, invited Prof. F. Ram, Director, IIPS, Mumbai, school childrens, school representatives and parents from L.V.A Sarvodaya Vidyalaya and Swami Ramkrishna Paramhans High School, Govandi. Ms. Chandrakala Ramnayan, Explained the Kisan Diwas Celebration in schools and IIPS.

Dr. F.Ram, Director IIPS, explained the importance of kisan diwas to the audience and distributed prizes and certificates for the winners in various competitions.

Winners receiving prizes and certificates from the Director, IIPS

Best performers of Kisan Diwas competition in schools with their prize and certificates

Dr. Aparajita, Pop-Envis Coordinator, thanked the students, teachers, principal and parents of L.V.A Sarvodaya Vidyalaya and Swami Ramakrishna Paramhans High School for their dedicated support to their students for participation in Kisan Diwas competition and also thanked the students and staffs of IIPS for their active participation.

Pop-Envis Workshop on Customized Hands-on GIS Training (18th to 22nd January, 2016)

Population and environment are highly inter-related. There are number of issues which need special attention by population scientists: like impact of population parameters on environmental components, projecting the impact, sustainable development adaptation and technological innovations, price mechanism, global warming and contribution of India, environmental changes and its estimates, impact of environmental changes on economy and development etc. To achieve sustainable development, the impact on environment and biodiversity due to human activities needs to be carefully assessed at regional and landscape level. During past decades there was huge problem in analyzing Geographical data. However, from the last decade GIS has become a decision support system. GIS emerged as a major branch of science like geography, geology, civil engineering, environmental science etc. The major advantage of using GIS is its ability to link the spatial and Aspatial data which helps to perform different types of analysis depending upon the objectives of the user and derive some meaningful information.

The workshop aims to highlight the importance of GIS, its applications in various fields to the students, research scholars and research aspirants of various institutes across Maharashtra. Forty (40) students from various background ranging from Mathematics, Statistics, Geography, Social Sciences and Geology from different academic institutes in Mumbai and Nashik including International Institute for Population Sciences (IIPS), Mumbai University, K.J.Somaiya College of Science and Commerce, G.D.A.B College Malegaon and Tata Institute of Social Sciences (TISS) participated in this workshop.

Inaugural Session:

The workshop was inaugurated on 18th January 2016 at 2.00 PM by Prof. F. Ram. Prof. F.Ram in his inaugural speech highlighted the importance of GIS to the students. Dr. Dhananjay W. Bansod, Pop-Envis Coordinator, welcomed all the participants and elaborated the objectives of the workshop and introduced the experts to the participants. Dr. Aparajita Chattopadhyay, Pop-Envis Coordinator, IIPS, Mumbai, explained the activities of pop-envis and the importance of GIS to the participants.

Teaching Session:

Expert for the workshop was Dr. G.S. Rao, Retired Faculty, Symbiosis Institute for GIS and Mrs. Sudha G, Information Officer, pop-envis Project, IIPS, Mumbai. The 5 days workshop covered lectures followed by practical session. Theory part will also be covered during practical session wherever needed.

18th January 2016

The first day session was started by self introduction of all the participants from different institutes. Mrs. Sudha G., Information Officer, pop-envis Project, IIPS, Mumbai. She is an M.Sc in Geo-informatics and M.Sc in Geography and has around 5.0 years experience in GIS and mapping. She grouped the session into two - theory and practical. In the theory session, the expert delivered a lecture on GIS, its importance, the need for using GIS and she also explained the importance of maps. In the practical session, expert explained students how to open Arc map, explained all the tools in Arc map, how to geo-reference a topographical map and set coordinate system to the same and how to geo-reference a jpeg image with the help of topographical map. The students were given the datasets and were given enough time to practice.

19th January 2016

Before starting the second day session the expert recollected the first day's session and then started the second day's session with a lecture on "*Graphical Representation on Spatial data*" in which the expert thought the students how to graphically represent the data, raster and vector data models with examples. In practical session, the participants were trained to create point, line and polygon shape files, how to set coordinate system to the shape files and how to digitize the features in arc GIS.

20th January 2016

The session started with a lecture on data input and editing, the expert practically explained how to enter attributes to the shape files created, how to rectify the errors while digitization and how to join the excel file with the shape file and also how to save the shape file. The participants were also given assignments for their practice. The expert also explained some of the tools for their research work such as append, clip, buffering, reclassify and spatial adjustment.

21st January 2016

The session started with a lecture on Public health GIS. In the practical session expert further explained how to prepare layout for a map. The expert also explained the use of Bhuvan web portal and how to prepare maps online using the Bhuvan web portal.

22nd January 2016

The session started with a lecture on Environmental GIS where the expert explained how to map the various environmental issues such as diseases mapping, pollution mapping etc. The participants were given 1 hour practical test and feedback for the 5days workshop was also collected from all the participants in prescribed format.

Valedictory Session

Dr. Dhananjay W. Bansod, Pop-Envis Coordinator, invited Prof. F. Ram, Director, IIPS for the valedictory function. He thanked the experts Dr. G. S. Rao and Mrs. Sudha G. for their bright lectures and their contribution in teaching GIS. Prof. F. Ram, Director, IIPS appreciated the coordinators of Pop-Envis for their good effort in organising the workshop.

Participants receiving certificates

Participants in the workshop

Dr. Aparajita Chattopadhyay, Pop-Envis Coordinator gave vote of thanks. She thanked the experts, (MoEF&CC), participants from different institutes, ICT unit, faculties and the facilitators for their kind support for the successful completion of the workshop.

F. Ram, distributed the certificates for the participants and also encouraged to use the new technologies wherever necessary for their research work.

International Institute for Population Sciences

Admission Announcement for the Academic Year (2016-17

Degree(Full-Time)	Eligibility Criteria
Master of Arts/Science in Population Studies (M.A. /M.Sc.) (50 Seats with Govt. of India Fellowship)	Bachelor's degree in social sciences including the subject of Mathematics/Statistics from a recognized university with at least 55% of aggregate marks or equivalent grade. The upper age limit is 25 years as on 30.6.2016.
Master of Science in Bio-Statistics and Demography (50 Seats with Govt. of India Fellowship)	Bachelor's degree from a recognized university with at least 55% of aggregate marks or equivalent grade with Mathematics or Statistics as core subject or other subject with at least two full papers on Mathematics or Statistics. The upper age limit is 25 years as on 30.6.2016.
Master of Population Studies (50 Seats with Govt. of India Fellowship)	Master's degree from a recognized university with at least 55% of aggregate marks or equivalent grade in Statistics, Mathematics, Economics, Psychology, Sociology, Social Work, Geography and Anthropology. The upper age limit is 28 years as on 30.6.2016.
Master of Philosophy in Population Studies (50 Seats with Govt. of India Fellowship)	Master in Population Studies/ M.A/M.Sc. in Demography/ M.Sc. in Bio -statistics and Epidemiology from a recognized university with at least 55% of aggregate marks or equivalent. The upper age limit is 30 years as on 30.6.2016.
Doctor of Philosophy (Ph.D.) in Population Studies (3 Seats with Govt. of India Fellowship).	M.Phil or Master's degree in Population Studies/M.Sc. in Bio-Statistics and Epidemiology of a recognised university with at least 55% of aggregate marks. The upper age limit is 30 years as on 30.6.2016.
Master of Population Studies (Distance Learning) (150 Seats)	Master's degree in any social science subject/Health/Maths/ Stats or allied subjects from recognized Indian/Foreign universities.
Post Doctoral Fellowship (3 Seats with Govt. of India Fellowship)	Ph.D. degree from a recognized university, in Population Studies or any other allied subject wherein issues related to population, health and development has been dealt with. The upper age limit is 40 years as on 30.6.2016.