INTERNSHIP PROGRAMME
Capacity building is one of the biggest challenges of the urban sector in India. One of the key outcomes of the Government of India’s (GoI) flagship programme Jawaharlal Nehru National Urban Renewal Mission (JnNURM) was the realization that Urban Local Bodies (ULBs) in India have limited capacity for project preparation, appraisal, monitoring and implementation. For the mission, both, states and ULBs were expected to implement reforms in a time bound manner; however, the achievements were inadequate (Grant Thorton, 2011).

In order to address the gaps that led to less than optimal outcomes in JnNURM, the mission in its second phase encouraged capacity building efforts that needed to be strengthened within the ULBs for improving service delivery and governance. The MoUD also prepared the Capacity Building (CB) toolkit to support States and ULBs to plan and implement capacity building programmes.

The Peer Experience and Reflective Learning (PEARL) Programme under JnNURM has been addressing knowledge and capacity building activities on urban reforms and city governance to successfully achieve the objectives of the mission. As part of this, PEARL initiated an activity to facilitate internship of graduate students and PhD scholars in the Municipal Corporations under the JNNURM. This aimed to provide an opportunity for interns to gain exposure from the local governments and their work in urban development, promote evidence-based research in the ULBs in India and allow talented and motivated student researchers to contribute to the urban sector.

The internship activity spanned over a three month period from April to June 2014. Students enrolled in bachelor’s programmes / master’s programmes / doctoral research programme related to the urban sector from any educational institution were eligible for this internship.
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ASSESSMENT OF WEST BENGAL URBAN EMPLOYMENT SCHEME

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ABSTRACT
Kolkata Municipal Corporation has taken an initiative to provide employment to 14000 youth through a 100 days work scheme called ‘West Bengal Urban Employment Scheme’ from January 2011. In this project youths were engaged in different types of work such as up gradation and improvement of slums, different types of engineering work, solid waste management, maintenance of parks and squares, different health services and for digging tube well. However, the number of people benefiting from this scheme has remained dismally low with only 25 days of employment provided by the government per household against the stipulated 100 days in 2012-13. In the current year, only 34 person days per household of employment has been provided, with the number not rising above 50 in all intermediate years of implementation. In this situation the need was felt to assess the performance of West Bengal Urban Employment Scheme to find out the real picture and assess whether it is actually successful or just a political stunt to expand the vote bank. The study investigates the performance of the scheme on the basis of various parameters, concluding with a list of suggestions from beneficiaries and other stakeholders, on how to make the scheme more effective in meeting its goal of alleviating urban poverty in West Bengal.

INTRODUCTION
One of the largest employment generation programmes in the world was launched in the form of the 100 days’ work scheme. The process is conceptualized to be coordinated by local self-governments in a participative fashion. The principle of self-targeting for the poor is embedded in the scheme, which makes provisions only for unskilled job creation at compensations pegged to prevalent minimum wages.

HISTORY OF 100 DAYS EMPLOYMENT SCHEME
The concept of 100 days’ work was introduced after introduction of National Rural Employment scheme Act in the year of 2005 which in also known as Mahatma Gandhi National Rural Employment Guarantee Act and was abbreviated to MNREGA. This is an Indian labour law and social security measure that aims to guarantee the right to work and ensure livelihood security by providing at least 100 days of guaranteed wage employment in a financial year.

Prior to the enactment of MNREGA India had no program that promised employment as a legal right. Although employment generation through manual works had long history in India dating back to the 1960s, since then the government had been merging the old schemes to introduce new ones retaining the basic objective of providing additional wage employment involving skilled and unskilled manual work with special safeguards for the weaker section.

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Key Features</th>
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<tbody>
<tr>
<td>1977</td>
<td>Food for Work Programme (FWP)</td>
<td>Providing food grains to complement wages</td>
</tr>
<tr>
<td>1980</td>
<td>National Rural Employment Programme (NREP)</td>
<td>Same objective as FWP</td>
</tr>
<tr>
<td>1989</td>
<td>JawharRojgarYojna (JRY)</td>
<td>Involving local people through Panchayati Raj Institution</td>
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<tr>
<td>1999</td>
<td>Jawhar Gram SamridhiYojana (JGSY)</td>
<td>JRY was renamed like this ue to implementation issue</td>
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<tr>
<td>2001</td>
<td>SampoornaGrameenRozgarYojna (SGRY)</td>
<td>Role of PRIs was retained with village panchayat</td>
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<tr>
<td>2006</td>
<td>National Rural Employment Guarantee Act (NREGA)</td>
<td>Integration of FWP and SGRY</td>
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development and food security the government integrated SGRY and FWP into a new scheme called Mahatma Gandhi NREGA.

**ROLE OF 100 DAYS EMPLOYMENT SCHEME**

This scheme works out quite well in India. Initially 150 backward districts were chosen for the 100 days’ work program, after which all 600 districts in India were covered in five years. The total cost is around Rs 40,000 crore annually. This is quite affordable, being less than 2% of the GDP — the total amount of money made by India in a year.

The Planning Commission in the approach paper for the eleventh and twelfth five year plan specifically emphasized on the inclusive growth. India has already achieved a very impressive growth rate of more than 8% in the eleventh plan, but the country is still facing the problem of mass poverty. India in this direction has done a commendable work by enacting the employment guarantee act which gives 100 days employment to reduce the poverty level. The role of 100 days’ work scheme in national scenario is as follows:-

**Employment:** Such schemes have provided 4.62 crore households with employment out of which nearly 30% are scheduled caste (SC) and 22% are scheduled tribe (ST).

**works:** The total works undertaken has increased by almost 70% between 2006-2007 and 2007-2008 under these schemes.

**Inclusion:** Participation of women in economic activities has been increased through these types of schemes. Work participation became higher among economically and socially backward groups after introduction of these schemes.

**WEST BENGAL URBAN EMPLOYMENT SCHEME**

Kolkata Municipal Corporation has also taken a great initiative to provide employment to 14000 youth through 100 days’ work scheme called ‘West Bengal Urban Employment Scheme’ from January 2011. Employment was promised in all 141 wards. Employees in this program were recruited in three different categories. It mostly comprised of unskilled labours who get a remuneration of Rs 100/day who are mainly engaged in unskilled physical work. For every 10 unskilled labours one supervisor was recruited who gets Rs 120/day and there are skilled labours that get Rs 167/day who are mainly responsible for keeping records and doing computer works. This scheme is motivated by Mahatma Gandhi National Rural Employment Guarantee Act (MNGREG) which provides enhancement of livelihood security, giving at least 100 days of guaranteed wage employment in every financial year household, whose adult members volunteer to manual work.

In this project youths were engaged in different types of work such as up gradation and improvement of slums, different types of engineering work, solid waste management, maintenance of parks and squares, different health services and for digging tube well. The process recruitment of employees for different project under this scheme is totally done and controlled by the local councillor. This method was initiated to promote public partici-

**Rationale**

The theoretical rationale behind this program is fourfold: i) mitigation of unexpected and seasonal shocks ii) mitigation of idiosyncratic shocks iii) anti-poverty measures; and iv) provision of public goods and services.

**Mandate**

The Act mandates enhancing livelihood security by providing at least 100 days of guaranteed wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work.

**Objective**

The primary objective of the Act is augmenting wage employment for the poorest of the poor while the secondary objective is to strengthen natural resource management through works that address causes of chronic poverty, and thus encourage sustainable development.

**Design features**

**Key design features in the context of social security and unemployment support:**

- **Guaranteed Employment** - Any adult member of a rural household applying for work under the Act is entitled to employment. Every household is entitled to not more than 100 days of employment. Three types of employment is given under this program. Such as skilled Worker, unskilled labour and supervisor.

- **Guaranteed Wages** - Wages are to be paid on a monthly basis through the bank account created by the government at any branch of United Bank of India. Wages for different category workers as follow:-

  - Skilled Worker - 167 INR/day
  - Supervisor - 120 INR/day
  - Unskilled Labour - 100 INR/day

- **Unemployment Allowance** – If work is not provided within 15 days of applying, the state is expected to pay an unemployment allowance which is one-fourth of the wage rate.

- **Provision of Work** – Work is to be provided within a 5km radius of the applicant’s residence, else compensation of 10 per cent extra wage is to be provided to meet expenses of travel.

- **Gender Equity** - Men and women are entitled to equal payment of wages. One-third of the beneficiaries are supposed to be women. Worksite facilities like crèches are to be provided at all worksites.
• Transparency and Accountability – Scheme related accounts and records documents have to be available for public scrutiny. Contractors and use of machinery is prohibited.
• Rights-based, demand-driven approach – Estimation and planning of work is conducted on the basis of the demand for work. Hence, beneficiaries of the scheme are enabled to decide the point in time at which they want to work.
• Renewal of contract - The contracts are to be renewed after each 100 working days. At the time of renewal application from new candidates are to be invited and renewal of the scheme is to take place after a gap of 5 days from the previous session of 10 working days.

OBJECTIVES OF THE STUDY
The prime objective of this study is to assess the performance of West Bengal Urban Employ Scheme.
The performance of the scheme will majorly be assessed in terms of following parameters:-

Number of employment generated
This scheme promised employment of 14000 youths in all 141 wards under KMC. But according to some leading newspapers due to opposition to the leading party this has remained only as a number and the reality is far away from pen and paper. The aim of this research is to find out how many people have actually been employed under this scheme.

Types and level of service
People employed under this scheme are engaged in different sectors and most of them are involved to enhance the efficiency of any service provided by KMC. For example due to shortage of man power in solid waste management department, a year back the vats all around the city were cleaned only once a day. Whereas now they are cleaned three times daily with the help of additional employees employed under this scheme.

This study is intended to find out what types of works are done under this scheme and how the employees employed under this scheme are adding efficiency to different existing services provided by KMC.

Payments to the labours
Obviously just 100 days of work is not enough to pull an entire family out of poverty if it has no other means of earning a livelihood. But it’s a start. Having money, even a little, helps you make more money, helping break the poverty cycle. Three types of workers get employed under this scheme such as skilled worker, unskilled workers and supervisors. Among them skilled labours get 167 Rs/day, supervisors get 120 Rs/day and the unskilled labours get 100 Rs/day. The labours are more often not paid daily and they are paid finally after 3 months.

One of the important objectives of this study is to find out whether the labours employed under this scheme are paid regularly with the amount they were promised to be.

Transparency in the process of recruitment
According to this scheme only one member from each family who are willing to work should be employed under this scheme from all wards. The recruitments under this scheme should totally be controlled by the ward councilor. But the final approval for any recruitment must be taken from mayor in commissioner.

This study is aimed at finding out the level of transparency in the process of recruitment in West Bengal Urban Employment Scheme

Suggestions from the beneficiaries
Last but not the least this study will try to address the suggestions and the expectations of the beneficiaries.

MOTIVATIONS FOR THE STUDY
Chief minister Mamata Banerjee, on 24th April, 2014 said that West Bengal has emerged to be the first ranking state in terms of expenditure on employment generation under 100 days’ work scheme. According to her, the State has achieved expenditure of more than Rs. 5521 Cr for the year 2013-14 which is the highest in the country. Out of this expenditure Rs 1815 Cr is payment due liability and not received from the Government of India.

Whereas according to State minister for Urban Development Smt Deepa Damunshi “The state has ranked 24th on the list, whereas the (Trinamool) government very boastfully claimed otherwise. It easily nailed the lie of the State Administration as they are misleading people with wrong information ahead of the panchayat elections.”

According to a famous newspaper the results of West Bengal Urban Employment Scheme are shocking. In 2012-13, till date, the government could only give 25 days of employment per household against the stipulated 100 days. The best the state could ever achieve was 36 days in 2010-11 and further down to 25 days in 2010-11. The average is 42 person days per household in 2011-12. In the current year, only 34 person days per household of employment has been provided till date.

In this situation the need was felt to assess the performance of West Bengal Urban Employment Scheme and to find out the real picture and assess whether it is of actual success or just a political stunt to expand the vote bank.

DESCRIPTION OF RESEARCH WORK

RESEARCH PROBLEM
The problem which this study is intended to solve is to find out how West Bengal Urban Employment scheme is performing to eradicate urban poverty and unemployment?

METHODOLOGY
This study was conducted using both in qualitative and quantitative approach. The quantitative data was collected from different responsible departments within KMC and the qualitative data was collected by interviewing different stakeholders. This whole study was supported by appropriate photograph, tables and charts.

The research was majorly based on qualitative study and
the method used to conduct this study was Ethnography where different stake holders related to this scheme were interviewed in detail to assess the overall performance of this scheme. Few workers from each category (skilled, unskilled and supervisor) was interviewed. Other than them some of the ward councilors and the officials from KMC who are related to this scheme were also interviewed.

**EXPECTED OUTPUTS**

It is expected that this study will present a clear picture about how the West Bengal Urban employment Scheme is performing to reduce urban poverty and urban unemployment. This study will also reveal whether the benefits of this scheme are properly reaching to the target groups or not. This study will also bring some clarity on the level of transparency in this scheme.

**DISCUSSIONS AND OBSERVATIONS**

**SECONDARY DATA ANALYSIS**

All the secondary data required for the study has been collected from different departments of Kolkata Municipal Corporation. Collected data has been analyzed with the help of different types of graphical methods such as bar graph and pie graph. All data has been analyzed in two ways. Firstly it was analyzed how much proportion of the total worker was employed under which sector and secondly it was analyzed how many people are employed in which borough.

From the collected secondary data it is clearly visible that

**FIGURE 1**

[Pie chart showing the proportion of workers in different sectors]

Source: Bustee Service Department, Kolkata Municipal Corporation, 2011

**FIGURE 2**

[Bar graph showing distribution of workers in different boroughs]

Source: Bustee Service Department, Kolkata Municipal Corporation, 2011
maximum people have been employed in the department of solid waste management and minimum number of people was employed in health department under West Bengal Urban Employment Scheme. Under solid waste management sector people were employed to collect garbage at evening. On the other hand under health sector people were employed to sprinkle insecticide to prevent different insect driven diseases as a door to door service. (Fig 1)

This implies health sector is most deprived in terms of workers provided by the scheme as it works only for malaria preventive programs. This sector should involve more and more workers from this scheme to improve the health services. Other than this Bustee department also demands large number of workers as it works for slum development programs. On the contrary to these most of the employees are employed in s.w.m department as it involves less working hour and working hour at evening shift. *Borough- Borough is an administrative unit under Kolkata Municipal Corporation area. It is comprised of a group of wards. There are total 15 boroughs comprising 141 wards with in Kolkata Municipal Corporation Area.

Among all the boroughs number 10 borough comprising ward number 81 to ward number 100 has highest number of workers employed under this scheme on the other hand borough number 12 comprising ward number 101 to ward number 109 has lowest number of persons employed under this scheme. Other than them borough number 5, 7, 13, 15 have quite large number of persons employed under this scheme and borough number 2, 9, 12 have very few persons employed under this scheme. (Fig2)

Out of all the employees employed under this scheme most of them are unskilled labour and do manual work against a payment of Rs 100/day. According to figure 3 distribution of unskilled labour among different sectors follows almost same pattern as the distribution of total workers. Solid waste management sector has maximum number of workers employed under it and health sector has minimum number of unskilled labours employed under it.

This diagram shows that distribution of workers under this program is controlled by distribution of workers as unskilled labours. Distribution of unskilled labours is skewed towards solid waste management department as it allows the workers to peruse with other job during day time and to take it as a part-time job. Most of the workers under this department do not have any job and suffer from a situation of disguised unemployment.

As shown in figure 4, distribution of unskilled worker in different boroughs follows the same pattern as distribution of total workers under this scheme. Among all the boroughs borough number 10 has highest number of unskilled labours employed under this project followed by borough number 13, 5, 7 and 15. Within borough number 1 solid waste management sector has highest number of unskilled labours followed by pond management sector and health sector has lowest number of unskilled workers employed within this borough.

On the other hand borough number 2 has lowest number of unskilled labour employed under this scheme followed by borough number 12. Within borough number 2 also solid waste management unit has highest number of unskilled labour and health sector has lowest number of unskilled labour employed.

According to the guideline of the scheme, there should be one supervisor to look after 10 unskilled labours. For this the proportion of supervisors out of total workers also follows the general trend like unskilled labours. It also has maximum numbers of workers employed under solid waste management sector and minimum number of workers employed under health sector. The supervisors look after the works done by the unskilled labours
and report to the skilled worker against a payment of Rs 120/day. Other than the above mentions sectors, rest of the sectors has almost equal proportion of supervisors employed under them and follow same trend as unskilled labour. (Figure 5)

This figure shows an equitable distribution of unskilled labours and their supervisors. As per the rule of this scheme there should be one supervisor for 10 unskilled labours and figure no 5 shows appropriate distribution of unskilled labours and supervisors.

As per figure number 6 there are differential distribution of supervisor among different boroughs under KMC. Out of all the boroughs, borough number 9 has minimum number of supervisor employed and borough number 10 has maximum number of supervisors employed. According to figure 4 boroughs 9 have 724 unskilled labours thus it should have at least 72 supervisors. But in reality it has only 43 supervisors. Within borough number 9 solid waste management sectors has maximum numbers of supervisor but it is not enough to support the unskilled labour employed within the borough. On the other hand borough number 10 highest numbers of supervisors employed and the number of supervisors under different sectors within this borough is in parity with the unskilled labours. (Figure 6)

Proportion of skilled workers out of total workers does not follow the general trend as supervisor and unskilled labour. As per figure number 7 solid waste management sector has 75% labours employment under 100 days’ work scheme and health sector does not have any skilled worker employed under this scheme. Other than this pond management unit and bustee sector also have very less number of skilled labour employed under them. This shows disproportionate distribution of skilled and unskilled labours. In solid waste management sector where proportion of unskilled workers and supervisor is only 47%, the
proportion of skilled labour is 75% of the total workers employed under this scheme. (Figure 7)

Distribution of skilled labours is different from distribution of unskilled labours or supervisors. In every other department proportion of skilled labours are equal or less than unskilled and supervisors but in solid waste management department proportion of skilled labours is way higher than unskilled labours and supervisors. This also implies a situation of disguised unemployment. Those extra skilled workers should be redistributed and sent to other departments like health department where there is not a single skilled worker is working in it.

As per figure number 8 distributions of skilled labours among all the boroughs are not equally distributed. Borough number of 8 has highest number of skilled labours employed and borough number 6 and 7 has lowest number of skilled labours employed under this scheme. Under borough 8, solid waste management sector has highest number of skilled labours employed under this scheme. Not only that borough number 8 has highest number of skilled labours employed under solid waste management sector among all the boroughs under Kolkata Municipal Corporation. (Figure 8)

INTERVIEW OF STAKE HOLDERS

After analyzing secondary data collected from different sources, an attempt was made to analyze the scheme through interviewing some stake holders of the scheme.

Interview 1

Rohit Mondal, a 27-year-old living in Bansdroni is an unskilled labour employed under west Bengal Urban Employment Scheme. He was employed under this scheme in the year of 2013 in solid waste management section. He could hardly believe it when his income rose by nearly 20% overnight. Mondal, a driver by profession, used to earn `4,000 a month. That was till he met a local leader and the leader took him to the local councilor, who got him enrolled under the right to work’ scheme. His salary apart, Rohit now earns `100 a day for the work he does under the scheme.

What does Rohit do? “I do all kinds of work, from cleaning streets to disposing garbage. “Mostly, I have to clean my neighborhood. It is not that I get work every day. But I have been told that I will be given work for 100 days during this year,” Mondal
said. So, that works out to an income of `10,000 a year over and above the `48,000 annual salary plus `4,000 bonus (equal to a month’s pay) he earns as a driver a hike of 19.23%.

According to rohit his contract under this scheme was renewed from the borough office without any problem and he comes for work at second half and work for 3-4 hours. He gets one day break after 6 days of working day. And he also gets 4 days of break during durga puja. Rohit is over all happy with his job under this scheme but he is not satisfy as he is not getting as much benefits as the permanent unskilled workers of solid waste management department is getting and thus he wants equal benefits for him and his colleagues.

**Interview 2**

In contrast to Rohit, Haran Das is employed only under West Bengal Urban Employment scheme and does not have any other source of income. He was employed in the year of 2011. He was employed under pond management unit as an unskilled labour. 40 years old Haran was much relieved after getting employed under this scheme.

What does Haran do? Haran said in works in ward number 9 only. His work is to maintain all the ponds and water bodies in that ward. He works for 12-5 p.m. he gets 100 days of work every year and like Rohit he also gets 1 day of break after 6 working days. He gets paid with an amount of Rs 100/day and he also gets Rs 1000 as puja bonus at the time of Durga puja.

As Rohit, Haran also got employed after the local leader of his ward took him to the ward councilor and he is also getting the regular renewal of his contract for last 3 years. Haran is not happy with the amount of payment he is getting and wants to have some extra benefits as the permanent workers are getting. He also demands to make his appointment permanent as an unskilled worker of Kolkata Municipal Corporation.

Haran also told about some health issues related to his works and how the government is reluctant about safety and security of the workers employed under this scheme.

**Interview 3**

Sanjay Guha, 25 was employed under West Bengal Urban Employment Scheme was employed as a skilled labour in the year 2012 in the department of Pond management unit. He was graduate and was looking for a job when the local leader from his area took him to the party office and enrolled his name for skilled labour under this scheme. He was asked to have computer knowledge as a qualification for the job.

The major job of Sanjay is to make bills and pay slips for the employees under pond management unit. He is also responsible for making list of the workers working under this project with his block. According to sanjay he is responsible of looking after almost 800 unskilled labour and 75 supervisors. The supervisors report to him about his work and all the unskilled labours working under supervision of him.

Sanjay gets paid at a rate of Rs 167/ day and is not at all happy with his payment. He is working under this department for last two years do not get any kind of increment. According to him he has to do other official works also other than the works related to the scheme. Even though he was employed under pond management unit, he has to do work for other departments like solid waste management, bustee department also. His basic demand from this job is more payment and of course permanency of his job and some income benefits.

**Interview 4**

Nobendu Dutta, 40, was an employee of an jute mill near to kolkata and is unemployed for last 7 years until he got the job of a supervisor under West Bengal Urban Employment Scheme. Initially he applied for the post of skilled labour but his application got rejected as he did not have any computer knowledge. Currently he is a supervisor under pond management unit.

As the post depicts, his main job is to supervise the works done by the unskilled labours under pond management department. As per the rule of the scheme there are 10 unskilled labours under supervision of Nobendu. For this he gets paid at the rate of
Rs 120/day. His job is to look after whether the unskilled labours are working properly or not thus he looks after if the ponds and water bodies within his job area is clean enough of not and he reports to the skilled worker.

As any other workers employed under this scheme, he is also not happy with the payment and the other problem with his job is that he has to pay for all the photocopy and printouts needed for his job. But Nobendu is very companionate about the workers working under his supervision of him and he wants them to be permanent worker under Kolkata Municipal Corporation.

**Interview 5**

Romen Bissas, 32, living in Shyambazar area was employed under Wet Bengal Urban Employment scheme in the year of 2011 as an unskilled labour under park and square management department after the local leader took him to the local councilor.

According to him his work is to maintain all the parks and squares located to his area and also to maintain the plants planted in the road divisions. He has to water the plants every day. He is also responsible for clearing all the road side shrubs and plants. He has to work for three days a week from 12-5 p.m and gets Rs 100/ day.

He is overall happy with his job but according to him there should be more recruitment under this department as he has to do much more work than other workers employed under other departments. Like other unskilled labours, he is also not happy with the amount of payment he is getting from this job.

**ASSESSMENT AND IMPORTANT FINDINGS**

After analyzing all the secondary data and conducting interview with some stake holders of the scheme some important finding were revealed and the final assessment has made. As mentioned earlier the assessment was made with the help of certain parameters as follow:-

**Number of employment generated**

This scheme promised employment of 14000 youths in all 141 wards under KMC. But all the data collected from the different secondary sources shows that up till the year of 2014 only 13599
workers were employed under this scheme. Out of them 319 are skilled labour, 1209 are supervisor and 12079 are unskilled labour. This shows the scheme is yet to fulfill the promised number of employment generation.

**Distribution of workers across the boroughs**

As per the guidelines of the scheme all the workers employed under this scheme should be distributed equally among all the 15 boroughs but the secondary data shows a differential distribution of workers among the 15 boroughs. The data collected from different secondary sources shows borough 10 has 1082 workers employed, whereas borough number 2 has lowest number of workers employed under this scheme which is almost 300 workers lesser than borough 10.

But according to figure number 9 borough 7 has highest number of non-working population with under KMC and borough 6 has lowest number of non-working population. As per these numbers borough 7 should have highest number of employment and borough 6 should have lowest number of employment. But in reality borough 10 and 13 has more number of employment than borough 7 and borough number 2, 3, 9 and 12 have less number of less number of employment than borough 6. This clearly shows unequal distribution of employment among all the boroughs.

**Distribution of workers across the departments**

People were employed under 5 different departments like Engineering, Bustee, Solid waste management, pond management, Park and squares and health department. From all the data collected from different secondary data it is evident that distribution of workers is not equal between all the departments. In most of the cases solid waste management unit has absorbed highest number of workers. Solid waste management department has almost 50% unskilled labours and supervisors employed and 75% skilled labour out of the total workers employed under this scheme. On the other hand health department has lowest number of workers employed under this scheme. This indicates all the departments are not equally benefited by this scheme.

**Payments to the labours**

Three types of workers get employed under this scheme such as skilled worker, unskilled workers and supervisors. Among them skilled labours get 167 Rs/day, supervisors get 120 Rs/ day and the unskilled labours get 100 Rs/ day. But after interviewing different persons employed under this scheme it is clear that none of them are satisfied with the payment they are getting from the scheme.

**Transparency in the process of recruitment**

According to this scheme only one member from each family who are willing to work should be employed under this scheme from all 141 wards under KMC. The recruitments under this scheme should totally be controlled by the ward councilor. But the final approval for any recruitment must be taken from mayor in council.

But after interviewing different workers employed under this scheme it is clear that the recruitment procedure is not that transparent. Most of the people are employed with an influence of local leader and renewal process is also questionable. Contracts of the existing workers are renewed without any proper notice. For this new recruitment does not take place under this scheme.

**Suggestions from the beneficiaries**

After interviewing the workers employed under this scheme some suggestions can be noted. Such as:-

- Government should be more considerate about the amount of payment.
- Government should be more careful about the health hazards related to the job.
- All of the workers demanded to make their job permanent under kolkata Municipal Corporation.
- According to some of them people are getting employed under this scheme as a part time worker whereas this scheme is supposed to support the unemployed persons. In this case they suggest making the recruitment process more particular.
- Most of them want the recruitment process to be free from political interference.

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<td>5641</td>
<td>6426</td>
</tr>
<tr>
<td>P &amp; S</td>
<td>7</td>
<td>173</td>
<td>1753</td>
<td>1933</td>
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<tr>
<td>HEALTH</td>
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<td>12</td>
<td>283</td>
<td>295</td>
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<tr>
<td>Total</td>
<td>289</td>
<td>1201</td>
<td>12079</td>
<td>13569</td>
</tr>
</tbody>
</table>

Source: Bustee Service Department, Kolkata municipal Corporation,2011
DISTRIBUTION OF LABOURS UNDER WEST BENGAL URBAN EMPLOYMENT SCHEME
THESE DATA WAS USED TO ANALYZE DISTRIBUTION OF EMPLOYMENT UNDER WBUES AMONG DIFFERENT ORUGHHS
AND IN DIFFERENT SECTOR:-

<table>
<thead>
<tr>
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<th>BUSTEE</th>
<th>ENG.</th>
<th>P.M.U.</th>
<th>S.W.M.</th>
<th>P &amp; S</th>
<th>HEALTH</th>
<th>TOTAL</th>
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<td>65</td>
<td>1</td>
<td>12</td>
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<td>90</td>
<td>3</td>
<td>19</td>
<td>160</td>
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</tr>
</tbody>
</table>

Source: Bustee Service Department, Kolkata municipal Corporation, 2011
CONCLUSION

From this study we can conclude that the West Bengal Unbar Employment Scheme even though has created many employments is not successful in every ways. It has been unsuccessful in terms of generating promised number of employment, equitable distribution of employments as well as among all the borough sectors covering, satisfactory payment to the workers, transparent recruitment procedure. This scheme needs huge attention from the government as in can really be helpful to eliminate poverty from the urban area of Kolkata. Thus it should be improved taking into account the suggestions from different stake holders.

This study has some future scope also. He possible reasons for the failure could be find out through other studies and it can also be find out the possible solutions to the problems and what else should be added to this scheme to make this scheme a success.

APPENDICES

DISTRIBUTION OF LABOURERS UNDER WEST BENGAL URBAN EMPLOYMENT SCHEME

These data was used to analyze distribution of employment under WBUES among different oroughs and in different sector:-

REFERENCES


A STUDY OF GROUND WATER DEPLETION AND RISE OF PRIVATE WATER SUPPLIERS IN GUWAHATI CITY

SUBMITTED BY:
Ronjyoti Brahma
TATA INSTITUTE OF SOCIAL SCIENCE, MUMBAI
ABSTRACT

The city of Guwahati is undergoing a rapid urbanization (35.81% urbanization) which has resulted into substantial growth in the population of the city. This has ultimately laid pressure on the service provision and the resources available. On one hand the ground water level of the city has decreased to an alarming rate and on the other hand there is a rise in the private water suppliers which has added to further exploitation of the ground water. The piped water supply provided by the Guwahati Municipal Corporation caters to only 30% of the city population. This paper attempts to look in to the reasons and relation between the key issues of ground water depletion, rise of private water suppliers and the role of Municipal Corporation. Several primary and secondary data has been collected through interviews, visiting different sites of the city and referring to several journals, official websites and newspapers respectively.

KEY WORDS: GROUND WATER DEPLETION, PRIVATE WATER SUPPLIERS, GUWAHATI.

INTRODUCTION

Guwahati is the major city in the north-east India and is also known as the gate way to the north-east. Guwahati comes under the Kamrup metropolitan district. The city is located along the bank of the mighty river Brahmaputra, also the city is surrounded by small hills. The river Brahmaputra is the major source of raw water for the Guwahati municipal Corporation. There are altogether 8 major water bodies situated in the Guwahati city namely: DeoporBeel, Silphukri, Dighaliphukhuri, Jorpukhri, BorsolaBeel, BondajanBeel, SorusalaBeel and SillsakoBeel, pointing towards the rich availability of water resources in the city of Guwahati. But the access to drinking water is restricted to 30% of the population only (City Development Plan Guwahati, 2006, p. 49), also Non-uniform distribution, both in terms of quality and quantity of water supplied as per reported by Assam Urban Infrastructure investment program (AUUIP), 2014.

The average annual rainfall in Guwahati is 1,600 millimetre (mm), which shows that Guwahati receives adequate amount of rain water. The rain occurs mostly between the month of May and September.

The government has failed to adequately use the rich amount of water resources present in the city, as well as the present water usage schemes are being implemented in an unscientific and unplanned manner, with lack of monitoring. This is seen as an impeding cause of falling of ground water at an alarming rate, where in certain areas the fall has been recorded to be up to 4.45 meters (AparnaDutta, 1999).

It was found that there is no Act that helps in regulating the usage of ground water which has led to the over exploitation of the same. While various schemes operated by various authorities are in existence the coverage area of those remain limited to those where already existing plans of providing protected water was there since the very beginning, due to which a gap between the demand and supply is seen in an extreme and major way. In order to overcome such shortage, there has been a high rise in the privatization of water and emergence of something called as the “water market”. As this research proceeds it is noticed that throughout the city private vehicles have taken up the job of providing water to the population which has added an extra burden to the already in danger ground water system.

Water market refers to a localized system of supply of water at a price to each member of the community. (Shah, 1993) These markets can be formal as well as informal in nature. The formal market of water is mostly present in countries where there is a regular and the water rights are clearly defined. In countries like India, informal water markets are present which is regulated by a) the presence of water bodies and b) the number of sellers. Considering the inadequate supply of water along with failure of the authorities to supply water in an equitable way, the “water market” has emerged. These water markets, especially in Guwahati are giving rise to a market where the say is of the sellers and exploitation of the buyers is the end result. Water is an indispensable commodity, therefore whatever price the sellers fix, the buyers are not able to refute them.

The threatening issue is that the water table in the some parts of the city has depleated to a very low level as a result there has been constant reflection in the local newspapers. Groundwater is one of the major ways through which the population gets its protected water from. The WHO defined the norms where a person needs at least a minimum of 135 litres of protected water per day, but in Guwahati with the need of 156 million litres of water to be served only 90 million litres of water is produced leaving a gap of 66 million litres. A quick historical background check on the water supply schemes and systems of Guwahati reveals that there has always been various issues in providing protected water to its citizens either due to lack of funds, pollution issues, sewerage system as well as availability of good water resources. It has been found that the municipal of Guwahati have suffered fiscal disabilities in providing protected water, therefore leading to the State and Union government taking up the responsibility of providing and managing the water supply service. These issues, along with inadequate quantity of water and condemned quality of water, continue to persist despite the succession of Municipal Board of Guwahati by the Guwahati Municipal Corporation.

MOTIVATION

Altogether there are five water treatment plants in Guwahati. But these water treatment plants are running below capacity (refer table: 1), the reason being that the water treatment plants are out dated (refer table: 2). All these water treatment plants were installed in 90s. Therefore, the piped water supply systems remain unreliable, as a result of which the city dwellers has to seek for their own source of water or depend on the water vendors.

Very often there are headlines in the newspaper and other electronic media sources stating that the city is facing and likely to face major water crisis due to ground water depletion(Kalita, 2012). So on one hand there is a threat that the ground water is depleting and on the other hand since the water supply from the municipal corporation is not adequate people relies on to al-
ternative sources such as self-bore wells and hand pumps and also private water tankers. Given such a case, what role has the concerned authority played? Such typical cases or issues have drawn my attention.

Recently the government of Assam has initiated three new water supply projects, namely, a Jawaharlal Nehru National Urban Renewal Mission (JNNURM) funded project for the south west region, Japan International Cooperation Agency (JICA) funded project for North and South central regions and Asian Development Bank (ADB) funded projects for the south East region of Guwahati Metropolitan Area (GMA). These three projects are aimed to provide 24x7 supply of water.

Through this table we can clearly see that there is a huge mismatch in the demand and supply of water. Along with this, there is a gap between the actual production and the production capacity. The table also points towards the water that goes unaccounted for, which is a shocking 40% where only two to three hours of supply of water is available to the residents. (AUIIP, 2014)

TABLE 1: PRESENT STATUS OF WATER SUPPLY SYSTEM, GUWAHATI

<table>
<thead>
<tr>
<th>SI.NO.</th>
<th>PARTICULARS</th>
<th>QUANTITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Present population of Guwahati (Census 2011)</td>
<td>1,246,082</td>
</tr>
<tr>
<td>2</td>
<td>Present production capacity</td>
<td>110.85 MLD</td>
</tr>
<tr>
<td>3.</td>
<td>Present actual production</td>
<td>73.4 MLD</td>
</tr>
<tr>
<td>4.</td>
<td>Estimated Unaccounted for Water</td>
<td>40%</td>
</tr>
<tr>
<td>5.</td>
<td>Overall per capita water availability at households</td>
<td>35 lpcd</td>
</tr>
<tr>
<td>6.</td>
<td>Maximum supply hours</td>
<td>2-3 hours per day.</td>
</tr>
</tbody>
</table>

Source: as reported by AUIIP (2014)  *Note: MLD= Million per litres, lpcd= litres per capita per day

IMPORTANCE OF THE RESEARCH PROBLEM IDENTIFIED

a) The research problems: As we all know that the purpose of any project is to fulfill the needs of beneficiaries. But the existing water supply infrastructure seems to be very exclusive in nature. Due to the inadequate water supply system the citizen are bound to hunt for own source of water. The ground water is depleting on one hand and on the other hand the inadequate supply of water by the concerned authority.

b) Expected outcomes: This research aims to give a glimpse of the current scenario of the water supply system in the city and the reason behind the rise of the private water suppliers. In short, the sustaining of the illegal water market and the failure of the concerned department is likely to come into picture.

OBJECTIVES AND METHODOLOGY

Knowing the mushrooming of the private water suppliers and the depletion of the ground water in the city of Guwahati is the main objective of this research, however the specific objectives are as follows:

a) To know the initiatives taken by the ULBs to control the ground water depletion?

b) To identify the sources of drinking water of the city residents?

c) To identify the factors leading to the rise of the private water suppliers?

d) Lessons that can be drawn from the current experience to reshape/take ahead the process of water supply system?

In order to attain the objectives of this study, qualitative research method approach was undertaken. Open interviews and semi-structured interviews were the methods of data collection.

Observation of the field visited was also one of the primary ways of data collection, where it was the aim of the researcher to study each aspect of the field.

Furthermore photographs provided further evidence of what the existing situation was. Apart from these methods Secondary Data collection of various research papers, newspaper articles,
official websites and researcher’s own data collection were referred to.

DESCRIPTION OF THE RESEARCH WORK
The entire research work was conducted to look into the bias situation of the depletion of ground water on one hand and the rise of the private water suppliers or could be said as the over exploitation of the ground water on the other hand. The condition of the ground water is inquired through several sources such as the daily newspapers, journals and also through interviews. There is no proper tracking mechanism for the existence of the private water suppliers, thus the existence of the suppliers was enquired through personal visit into several sites of the city. The existing water treatment has not been upgraded for several years. As a result of which the existing water pipelines has several leakages and are running below the installed capacity (CDP Guwahati 2006).

THE WATER SUPPLY SYSTEM OF THE CITY:
The city of Guwahati today has the population of about 963,489 (census 2011). Of these nearly ten lakhs of population only 30% of the entire population has access to the central piped water supply system. This is very big issue and it needs an immediate attention, but leaving the issue aside, the concerned authorities and the funding authorities are playing a blame game.

The Actual production capacity of the existing water treatment of the Guwahati Municipal Corporation (GMC) is 110.85 Million Litres Daily (MLD). Since the existing treatment plant is outdated they are producing water far below the actual production capacity. At present the total production is around 74 MLD, of these majority of the raw water supply comes from the Brahmaputra River and a small portion of the raw water is drawn from the deep wells installed by municipalities in certain locations of the city.

In comparison to the present population of the city the present demand of water in the city is around 150 MLD. So it is clear that there is huge gap in the phase of the demand and supply in water supply system. One would wonder how this huge gap in supply and demand is being filled up.

PRESENT STATUS OF GROUND WATER IN THE CITY
Scarcity of water is not a new issue, but the current level of ground water depletion has reached new lows. The city of Guwahati today is experiencing a massive and gradual decrease in ground water. As informed by the local people that some four to five years back the ground water was available at some 80 to 100 meters below the ground level but now the ground water level has decreased to 150 to 200 meters below the ground level. The situation becomes worst during the dry season when the ground water depletes drastically. The status of ground water varies dramatically among different wards, the reason being the numerous growths of apartments in certain regions. Due to the inadequate supply of water by the GMC the owner of the apartments choose to dig their own bore wells in order to fulfill the increasing need of water. The bore wells being the only source of water for those apartments has led to the over exploitation of ground water as a result of which the ground water not just depletes in that particular plot of land but also in the neighboring area. As a result of which the wells and hand pumps are becoming useless in most part of the city since the existing depth can’t fetch water any more.

In the map shown below, the Author clearly points towards the high retention properties of the soil in order to regenerate the ground water, but due to excessive pressure posed on the ground water by the increasing population, urbanization and inadequate and improper use of other resources, the ground water levels in most areas of the city are highlighted by the “poor” and “moderate” ground water potential zones. (Talukdaret.al., 2013)

THE EXISTENCE OF THE PRIVATE WATER SUPPLIERS
As we all know that with the increase in the number of population the pressure of dependency on the resources increases. The population of the Guwahati City is ever increasing with the rapid growth in the urbanization. The size of the population might increase to any number but the natural resources such as ground water can’t be increased. The case is that every now and then

<table>
<thead>
<tr>
<th>NAME</th>
<th>INSTALLED CAPACITY (in MLD)</th>
<th>YEAR OF INSTALLATION</th>
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</thead>
<tbody>
<tr>
<td>Hengerabari Water Treatment Plant</td>
<td>2.77</td>
<td>1996</td>
</tr>
<tr>
<td>Panbazar Water Treatment Plant</td>
<td>9.89</td>
<td>1960</td>
</tr>
<tr>
<td>Satpukhri Water Treatment Plant</td>
<td>4.99</td>
<td>1985</td>
</tr>
<tr>
<td>Kamakhya Water Treatment Plant</td>
<td>1</td>
<td>1992</td>
</tr>
<tr>
<td>Panbazar Water Treatment Plant(PHED)</td>
<td>2.5</td>
<td>1996</td>
</tr>
</tbody>
</table>

Source: CDP Guwahati 2006
there are headlines in the city newspaper regarding the alarming rate of ground water depletion in the city of Guwahati.

The depth of the ground water today in the city ranges from 150 to 200 meters below the ground level as quoted earlier. In order to meet the requirement of the ground water some of the residences with sound economy manages to deepen the existing bore wells and the rest of the citizens depend on the water supply systems be it the piped water supply system or the supply through the tankers.

Some of the residences that manage to exploit the ground water deep down have started a very disastrous practice of selling the ground water that they manage to pump out.

The picture shows the Borewell earthed deep down to pump the ground water. Well it has got two pipes connected to it. One pipe is for the personal consumption and the other one for the purpose of selling.

There are numerous such Borewell that exists in the city even though they are illegal. As a result of such unchecked Bore wells the ground water of the area depletes further and becomes difficult for the shallow Borewell existing nearby. So the crux of the problem is the unchecked exploitation of the ground water through setting up of deep Borewell in the city.

HOW THE ENTIRE NETWORK OF PRIVATE WATER SUPPLY WORKS
In the background research of how the water is being supplied by the authorities, as well as reflecting on the current water supplying framework and schemes it is clear that there is an acute shortage and lack of implementation of schemes. Water is something that is extremely essential for survival, be it the daily chores or for drinking. Such acute shortages has led to rise in the water tankers getting water from various resources, supplying in the city, providing door step delivery of water at extremely high prices, making it a seller’s market and hence dominating it.

With no regulation on the water supply and no interference curbing such private supplies, it has opened the availability of a new water business market, where least investment is required and the returns are huge due to the commodity (water) being so essential in everyday life.

In order to understand the rising private water business, it is important to look at who these water suppliers are. Anybody who holds a driving license and possesses a mobile phone can be a supplier, because of the lack of any regulation or law which controls such activities. The vehicle that are used to supply are the three wheeler vehicle (called as AUTO/TEMPO) in which a water tank and electric pump is attached with. The mobile
number is painted in the tank so that anybody in need of water can dial and call them.

The drivers are in close contact with those who sells water; also in some cases the sellers themselves possess vehicles. So whenever there is a call seeking water, the driver fills the tank and delivers it to the desired location. Since there is no regulation to nab them, nobody dares to question them. The charges for water range from Rs. 180 to 250 for 600 litres based on the distance from the source. As the demand for water increases the rate too increases since there is no regulation to control the price too.

Water availability at such high prices points towards the obvious exploitation of buyers, yet they continue to exist and thrive, because they emerged as a result of huge gap between the demand and supply of water, which is the most essential commodity. Since the current established authority is failing to deliver to its promises the “buyers” of water are left with no options but to cater to this available, expensive “water market”, or personally adopt methods of extracting water for their purposes.

THE FAILURE OF THE SYSTEM/ AUTHORITY

The obstacles encountering the Municipal Corporations in the supply of water are huge. Starting from lack of funds to availability of good water resources, have all led to the failure of the authority in providing water to its populations at an equitable, regular and subsidized rates. Brahmaputra river being the available exhaustible resource for the Guwahati Municipal Corporation along with the ground water availability are the two resources for water provision.

The historical data shows that the Municipal Corporations faced many glitches in either the implementation of the schemes planned, and often it had to handover its projects to either the provincial or Union government, leading to inequitable distribution of water, and the water supply being restricted to certain areas only. There were also many questions raised on the quality of water being supplied.

The existing water supply system is very old and on the other hand the machines and the motors used in the treatment of water are so huge that it requires huge generators. Since the Guwahati municipal corporation is short on funds they cannot afford to have huge power backup system (The exact statistical data was not provided to the researcher). They are fully dependent on the electricity supplied by the Assam State Electricity Board (ASEB). But the fact being that Assam is in a huge crisis of electricity, therefore many a times due to the long power cut the water treatment plant halts and thus the water supply gets disrupted.

The existing pipelines are in a very dilapidated condition, “there are many leakages and sometimes there is flow of dirty water” as per the show keeper who has piped water connection. The supply of water is very irregular; therefore it becomes very difficult for the people to just rely on the piped water supply system. During summer season the city receives enormous rain leading to flooding in the city. As a result of which contaminated or dirty water enters the leaked pipes.

THE ASSAM GROUND WATER CONTROL AND REGULATION ACT, 2012

The Assam ground water control and regulation Act, 2012 which is actually meant to control and regulate the ground water is not
FIGURE 2: THREE WHEELER VEHICLE FOR THE SUPPLY OF WATER

FIGURE 3: ONE OF THE EXISTING WATER TREATMENT PLANTS
yet been put to practice by the authority concerned. The reason is that the state Authority which is supposed to exercise the powers conferred on and to perform functions assigned to the state Authority under this Act is not yet formed as said by one of the officials of the water works department.

Such negligence by the authority has also added to the easy mushrooming of the private water suppliers. If practiced the Act has the provision for the controlling the illegal exploitation of the ground water as the Act clearly mentions under section 5 (5) that the State Authority shall also take steps to ensure that exploitation of ground water resources......Wherever there is mismatch, steps will be taken to ensure augmentation of ground water resources in addition to regulatory measure.

THE DEMAND OF WATER IN THE CITY
The demand of water supply can be best checked based on the basis of population growth. If we look into the pattern of growth of population in the past years than the rise in demand of resources in the city would come in contrast.

From the above graph it is clear that every 10 years there is a substantial growth in the population of the city. The reason is the rapid urbanization which is followed by the people migrating to the city in search of livelihood. Such a huge growth in the population leads to extensive burden on the city infrastructure and the resources of the city. The inevitable urbanization of Guwahati happened in an extremely unplanned and haphazard manner, where the city supports around 20 lakh inhabitants, almost a 500 percent increase from the 1980s. The earlier water supply system of Guwahati which could cater to almost 70 percent of the population, supplies only 71 million litres against the requirement of 250 million litres, catering to only 20 percent of the population. Even the population in the part of the cities that were supplied from the municipality till the 1990s, stopped receiving the public supply of water and hence to arrange for private water systems.

LIMITATIONS OF THE RESEARCH STUDY
The main objectives defined by this research was to understand the initiatives taken by the ULBs to control the ground water depletion, and to understand and suggest further steps that can be taken for the same. Due to the researcher’s lack in making and coordinating with officials the whole scenario and functioning of the Municipal Corporation and its current water supplying schemes could not be understood.

The seasonal constraints also restricted the researcher’s ability and availability to access certain areas of the city. Due to the illegal nature of the water supplying market, the researcher could not directly approach nor could collect accurate data from either the consumers or the suppliers of this water market. The unwillingness of certain officials to share certain information and grant permission to seek those information, the researcher faced an obstacle in collecting current and up-to-date information about the water supply system.

Thus, further researches focusing on these issues can be undertaken to provide a more accurate picture of the functioning of the Municipal Authorities, along with focus on the exclusive focus on the illegal water supply market can be undertaken.

GRAPH 1: POPULATION DETAILS OF GUWAHATI

Source: Various Issues of Census of India. *No Census was conducted in the year 1981
CONCLUSION/ WAY FORWARD

Guwahati, the gateway to north-east, with so many water resources present in and around it. The Brahmaputra River catering to need of water, still is suffering with the issues of acute water shortages and ground water depletion.

Through this research we tried to understand what the prevailing reasons were for such critical fall in ground water levels. This research also aims at studying what are the consequences of this ground water depletion on the city. It focuses on the reasons why despite of so many water bodies available the authorities have still failed to regulate the water supply throughout the city. It also tries to explore the alternatives that the population has to overcome the shortages in water supply and collected evidence points towards the growing water market, where the water is made available to the resident though private suppliers who have a monopoly and hence exploit its consumers, who lack any other options.

The research aims at bridging the gap between the lack of data available for the reasons of failure of the Municipal Corporations and the sudden rise of privatization of water. The research was able to conclude why the authorities failed in implementing their schemes as well as find the reasons for the poor regulation of water supply. This further led to findings about what is keeping the water suppliers so prevalent in the city (in fact an increase can be seen) despite they selling water at such high prices.

The current study was done to understand what the effects of such water markets are having on the available water resources, with the Brahmaputra River and the ground water being the only available resources. It tries to point at the extreme pressure on the ground water that is being faced due to rapid and inevitable urbanization and the consequent growing gap in demand and supply of water.

The study further motivates further researches on what solutions can be provided in order to overcome these challenges of ground water depletion and rise in the illegal and informal water markets. Further studies focusing on the reasons for gaps present in the implementation of present schemes can also be explored, alongside the decreasing quality of water supply can be further researched upon. The government has proposed and initiated three new water supply projects, namely, a Jawaharlal Nehru National Urban Renewal Mission (JNNURM) funded project for the south West region, Japan International Cooperation Agency (JICA) funded project for North and South central regions and Asian Development Bank (ADB) funded projects for the south East region of Guwahati Metropolitan Area (GMA). These three projects are aimed to provide 24x7 supply of water. The success of these projects depends on various factors like the implementation, the running costs, people’s participation and their reaction to these projects. The overall impact of these projects has yet not been studied, thus providing further researches on the same.

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EFFECTS OF INDUSTRIAL ACTIVITIES ON ENVIRONMENT OF DOON VALLEY

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ABSTRACT
Mining creates livelihood for many and minerals for day to day functioning of power plants, cement factories and many other industries. On the other hand, mining disturbs the geomorphology, air, water and soil conditions as mining requires extensive explosions in order to excavate the ever diminishing resource pool. It hence forth becomes a necessity, to investigate in detail, the various hazards that might affect the living conditions of the mining region and at times give rise to disasters like earthquakes and landslides (in hilly areas).

This paper will throw light on the various environmental issues that came forth in Doon valley due to technically backward mining methods. Recently, the mining activities have been put to a hold as per strict orders from the Supreme Court. Efforts were made to suggest apt usage of the mining areas that are rendered useless and are possible grounds for anti-social activities. These efforts made by the government were just enough for the restoration of the vegetation of the mined out areas but what about the large number of people of were left unemployed after the closure of these mines. Some of these abandoned mines can be used for different commercial purposes which can generate employment for many in the vicinity and also be productive for the society. This study is of the overall summary of all the happening in the mining sector in the valley.

INTRODUCTION
Limestone mining in Doon valley was once a major industrial activity. Limestone mining operations in the Doon Valley became wide-spread during the decade between 1955 and 1965. There were a total of 62 mines in the valley from which Limestone was being extracted day and night. Simultaneously the ancillaries to limestone quarrying – manufacture of lime by burning of limestone in kilns and the setting up of crushers for the production of marble chips for flooring and construction also came up in a big way. Around 8000 acres of hillside was being quarried in and around the period of 1960. These mines continued working till 1985 when the Supreme Court banned all the mining operations in the valley. At present Limestone quarrying in the valley is not being carried out. The problem doon valley is facing in present time is sand mining be it legal or illegal. Sand mining from the river beds to meet the demand of the construction sector is done by private contractors and in some areas by the government agencies.

DOON VALLEY
The Doon Valley is an unusually wide, long valley within the Sivalik Hills in the Lower Himalayas, in the state of Uttarakhand, India. Within the valley lies the city of Dehradun, the capital of Uttarakhand state. The Doon valley has abundance of greenery. It is surrounded by forests from all the sides. On the one side, it has the hills of Mussoorie and on the other, it is bounded by Himalayan range which is the source of perennial rivers like Ganga, Jamuna and Brahmaputra and the Shivalik range. The perennial streams and the fertile soil have contributed not only to the growth of dense lush green forests but have also helped in the yields of Basmati rice. Mussoorie is known as the “Queen of Hills” and Dehradun has turned out to be an important place of tourism, centre of education and research. [1]

FIGURE 1: GEOGRAPHY OF DOON VALLEY
On the basis of its rock and soil structure the Valley can be divided into three belts or ranges, namely, the Lesser Himalayan belt, the Doon Valley proper, and the Shivalik belt. The Lesser Himalayan belt consists of high grade limestone and shales at the base, passing gradually to dolomite towards the top, which is covered by a thin layer of soil. The Doon Valley proper is covered by unstratified and mixed pebbles and boulders with very little matrix. The Doon gravels of the Pleistocene age are covered by a thin layer of soil except in the river beds. These gravels are highly pervious, forming a poor water reservoir. The boulder bed of the drainage channels provides the underground course for most streams originating in the Himalayas, many of which disappear deep into the boulder bed for long stretches.

The Lesser Himalayan Ranges, which form the northern boundary of the Doon Valley, are part of the Great Himalayan Range. The Shivalik Ranges, which form the southern boundary of the Valley, are alluvial formations that are younger than the Himalayas, as they were formed by the debris which was swept down from the mountains. The Shivalik Ranges present a stiff face to the plains, while a long and gentle slope meets the foot of the Himalayas to form a shallow longitudinal valley. These valleys or longitudinal depressions formed between the Shivaliks and the Himalayas are generally called ‘Duns’. They are not continuous but are cut through by streams that drain the adjacent mountains. In some places the Duns disappear with the merging of the Shivaliks and the Lesser Himalayas. The lower parts of these Duns are generally covered by a deposit of boulders, so that the floor of the Valley is considerably higher than the level of the plains beyond the Shivaliks.

MINERALS IN THE VALLEY
There are many kinds of minerals which are found in Doon valley both major and minor. One of the most valuable major mineral found in the valley is Limestone. It is among the purest mineral available in the country. This limestone can be used in many industries i.e cement factories.

Due to the presence of various rivers Doon valley also has deposits of minor minerals in it in the form of Sand, Bolder etc.

OTHER INDUSTRIAL ACTIVITIES
Mining being the major industrial activity in the valley there are several other activities which are expected to come up in the near future, despite the fact that the doon valley has been declared as an eco fragile area by the government of India the state government in order to attract industries is providing tax relaxations etc.[3] recently the state government signed an MoU with the Hindustan Coca Cola allowing it to set up a 600 crore bottling plant on forty hectares of land in Charba village, Vikasnagar, Doon valley. Currently there are more than 60,000 trees of different species such as Shisham, Kher, Bakkaaiyan, and Sagwan, planted on this land by Charba village members. [3] These different species of trees will not be the only thing affected by this plant, the water reserve of the valley will also have severe impacts as from the past experiences wherever the company has set up its plant it has drained out the water of the area causing scarcity of water for the inhabitants.[3] The coca cola plant is said to have plans to meet its water requirements by taking water from the Yamuna river there is indeed enough water in the river to cater to the needs of the inhabitants but can it sustain with the extra load of the water requirements of the plant is the question here. The water level of the river Yamuna fluctuates on a seasonal basis, a bottling plant will further affect this fluctuation and diminishes the water source of the canals connected downstream from the plant. So what will they use instead? The alternative to this fluctuation would be for the plant to revert to groundwater to fulfill its needs and this will directly affect the groundwater levels of surrounding areas.

If these industrial activities going on in the valley are not regulated properly there are possibilities that the hard earn greenery of Doon valley will have to bear damages which might be beyond repair. With the above listed activities going on in the valley it is very important to bring out the long term effects of these activities on the valleys environment this research is aimed to pin point the type of industrial activity which is having most impact on the environment of the valley.

MOTIVATION
The history of mining in Doon valley is very old, if we look at the events in the past we can conclude that the ban on the mining in the valley has overall been a story of success towards which many elements of the society worked hand in hand. It was one of the first events in the history of our country where environmental considerations were prioritized over economic benefits and this became an inspiration for many other events similar to this. It all started in the valley when it was discovered that the hills of Mussoorie had the purest limestone deposits, before limestone was only extracted by the natives to prepare lime for construction and whitewash activities. Limestone was collected from the river beds and quarrying of the rock was unknown, after independence Dehradun became a major centre for the Punjabi refugees from Pakistan’s North west part who had large interests in rock salts mining there. These Punjabis were one of the first ones to start the large scale mining operations in the valley at that time there were no controls over mining and quarrying activities. Lime, Limestone and its crystalline form Marble chips found increasing demand with the growth of industry. Known as the world’s best scavenger Limestone found a use wherever there was a chemical purification process. A variety of industries from sugar to paper needed constant supplies. In 1961, the State minister of mines imposed restrictions on mining in the area. In less than a year, quarry operators successfully lobbied with the Chief Minister of the State to reopen mining operations. Mining leases were granted for 20 years and mining activities continued and existing mining safety rules were openly disregarded by the state officials.(Economic and political weekly,1987). After 1965, the negative effects of mining began to be felt in the valley. Peace and calmness in the valley was affected with the heavy machines and blasts done by the contractors. Trees were felled at random and lush green forests started disappearing, as we know
clearance of forests has disastrous consequences as forests are the means for maintaining and preserving the ecology.

In 1982, eighteen leases came up for renewal, the Department of Industries of UP had appointed a committee to decide the policy for renewal of the leases. The continuation of quarrying was recommended in the Nun Valley. In Banog, block quarrying was recommended on the condition that the Kempty Falls and the water pumping station for the township of Mussoorie were not damaged. In the Song Valley, total ban was recommended because of the practice of dip slope mining and the stability of the entire mountain was in danger. On these grounds, nine out of eighteen leases that were due for renewal were recommended to be allowed to continue. Others, however, were not recommended to be allowed to continue apparently on the basis of ecological considerations as well as for safety reasons. Despite these recommendations given by the committee the state government did not ban the mining activities in the valley possibly in the mindset that economic profits are more. In the perspective of this lack of control by official agencies, PIL in the SC of India was the only alternative available for the protection of the citizens’ rights to vital resources, as well as for the assertion of social control on activities related to the utilization of common natural resources owned by the community or Govt. for public use. In 1983, the Rural Litigation and Entitlement Kendra filed a petition in the supreme court complaining against the environmental degradation. In the same year, the Court prohibited blasting operations, while it was reviewing to determine whether the mines were being operated in compliance with the safety standards as laid down in the Mines Act of 1952 and other relevant mining regulations. The Court appointed an expert committee (the Bhargava Committee) to assess the mines. The case of Rural Litigation and Entitlement Kendra, Dehradun v. State of UP, is a very significant case in the history of environment protection movement in India. It involved the issue of environment and ecological imbalance as well as pollution of rivers and streams and recognized the epistolar jurisdiction of the court and required a balance to be maintained between development and conservation of natural resources. The main allegation related to unauthorized and illegal mining operations carried on in the Mussoorie hills and the area around it adversely affecting the ecology of the area which led to environmental disturbances. SC directed all fresh quarries to be stopped and called upon the District Magistrate and Superintendent of Police, Dehra Dun to strictly enforce the order.

In March 1985, upon the recommendation of the Bhargava Committee, the Court ordered that the most dangerous mines and those lying within the Mussoorie City Board limits be denied leases and that their operations cease immediately. The SC while deciding the issue of limestone quarries in Doon Valley, came across around 104 mining leases, which had direct environmental impact on the area. The limestone deposits in this area were of high grade having 99.8% calcium carbonate. The SC observed the adverse effects of mining in the valley area and held that the digging of limestone and allowing the waste to roll down or carried down by rain water to the low lying areas had affected the villages and the agricultural lands located below the hills. Blasting had disturbed the natural calmness of the area, had shaken the soil, loosened the rocky structures and disturbed the entire ecology of the area. Even the traffic hazards for the local population increased when the limestone was being removed from the mines. The SC also found that most of the mines were either within reserved forests or in forests lands covered by the UP Amendment of the Forest (Conservation) Act, 1980. If the mining operations were allowed in the area under strictest control, it would not only be violation of the provisions of the Forest (Conservation) Act, 1980, but would also be injurious to the restoration of the forest growth. So, the SC took the view that mining in this area should be totally stopped.

One of the mines which was allowed to continue operations by the interim order of the SC was the Nahi-Barkot mine operated by C.G. Gujral. The lease of the mine had expired in 1982, and for four years the quarry had been operated on the basis of an interim injunction from the local court in Dehradun. The ecological impact of limestone quarrying in the Nahi-Kala region was more acute since the area had rich resources of forests and water and since the mine was located at the origin of water resources and on a steep slope on the hill top. Despite these restrictions imposed by the supreme court over the mining activities there have been reports of limestone quarrying being carried out in the valley illegally, these illegal extraction of limestone is said to have been done on the abandoned quarried out chunks of land which were once in operation.

Since limestone mining is not allowed in the valley the extraction of minor minerals like sand and bolder is being done in the valley. Sand mining is done on the river beds. These sand mining operations are being done by a government agency named Garhwal Mandal Vikas Nigam. This agency also hires private companies to carry out different works, at the moment it has given contracts to some private companies to clean up the rivers and pick up the silt deposition in them.

With the ban on mining it was decided by the government of India that the industries in the valley be categorized (Red, green and orange) and permits be given accordingly but the state government declared the region as backward area and on the name of development is providing permits to industries which is becoming a major issue as many industries which are directly degrading the doon valley environment are being established.

OBJECTIVES AND SCOPE

The main objective of the research are:

- To study the environmental importance and characteristics of Doon valley.
- To study the history of industrial activities in the valley.
- To study the initiatives taken up by the government in the past for the greenery of the valley.
- To analyze the current scenario of industrial development in the valley.
- To find out the type of industrial activity that is degrading the valley.

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environment of the valley most prominently which is mining and abandoned mines in this case.

- To study the effects of these activities on air, water, land and food production.

The scope of the research is limited to the industrial activities in doon valley (physical boundary).

**METHODOLOGY**

The methodology adopted is shown in the figure below:

**FIGURE 2: METHODOLOGY**

**DESCRIPTION OF RESEARCH WORK**

Mining and quarrying has been going on in the valley since decades and the region which is one of the highest rainfall receiving areas of northern India faced drought in the summer of 1982. This happened because of the rapid cutting of trees and vegetation for clearing land for mining, the whole ecosystem of the valley got affected by it. Clearance of forests has a negative impact on ecology. The Dehradun Valley litigation is the first case requiring the Supreme Court to balance environmental and ecological integrity against industrial demands on forest resources. The case arose from haphazard and dangerous limestone quarrying practices in the Mussoorie Hill Range of the Himalayas.

Miners blasted out the hills with dynamite, extracting limestone from thousands of acres. The mines also dug deep into the hillsides, an illegal practice that resulted in the cave-ins and slumping. As a result, the hillsides were stripped of vegetation. Landslides killed villagers and destroyed their homes, cattle and agricultural lands. Lime stone crushers working day and night in the once serene and unpolluted Jakhan area of the Doon valley are ruining the environment of the valley beside threatening the health and peace of residents.

Located just 300 metres from the Rajpur road which takes tourists from all over the country to Mussoorie, these polluting units have created a veil of white dust, layers of which can be seen settled on the trees and other plants in the area. Worse still, they are operating within a residential area, causing constant air and noise pollution.

Since the residents of the area share a common power line with the crushers, they have to bear voltage fluctuations and abrupt disruptions in the power supply. Residents of the area, one of the most scenic in the valley, have been urging authorities to have the crushers shut down, but to no avail. The roads in the area are in state of complete deterioration as heavy motor vehicle constantly ply on them, carrying limestone to and from the crushers. Moreover, these trucks not only disturb the residents but are also a threat to the children playing within the colony.

Existing roads being damaged to such an extent in the valley leave little hope for all the dream-like projects of beautifying the Doon-valley being realised. The indiscriminate blasting operations used for quarrying enormous quantities of limestone from the steep hills caused many problems for the local villages who depended on the productivity of the land, for the sustainability of rural and urban water supplies, for the tourist trade of Mussoorie, for the large number of schools and other institutions in the doon and finally for the forest resources of the valley. Reckless quarrying in the hills destabilized the hydrological balance of the valley on which much bigger economic activities depend. Further, Limestone based industries such as cement factories were freely polluting the serene atmosphere with foul dust which causes Tuberculosis, eye, nose and other health problems.

**EFFECTS ON WATER RESOURCES**

Mining is a practice that destroys water catchments. Mining in precipitous was causing landslides and filling streams and rivers with debris. The hills of mussoorie which had limestones deposits in them had the property to trap water in them which can also be called as the natural overhead tanks given to the valley by nature. There were also many streams of water running inside through those hills which were keeping the rivers and canals of the valley alive, but because of uncontrolled limestone quarrying these hills were penetrated with the help of big machines and miners dug deep into them which resulted in the drying up of these water catchments within the hills. The mining and quarrying of limestone in the valley was being done in the most unscientific manner and no steps were taken by the contractors or the authorities to protect the debris from falling into the lower areas of the valley. This debris deposited in the rivers and water bodies. Silt deposition in the water bodies was also happening in access which posed the threat of flooding in the nearby villages. Because of the drying up of the water streams in the hills the valley which had enough water for all started facing problems of water shortage. For quarrying purpose the forest land was also being cleared rapidly by the contractors and trees were being fell and vegetation was destroyed. Because of this loss of the forest area the climate of the valley was also affected. Doon valley in the...
previous years enjoyed heavy rainfall had faced drought in 1982.

**EFFECTS ON FOOD PRODUCTION**

These canals might appear insignificant at first, are the greatest blessing to the people of the valley. In fact the people depend almost entirely on them for water for drinking and domestic purposes, and for the cultivation of all the more valuable crops. These canals are the lifeline of the valley.

This traditional agriculture provided the economic basis for a decent quality of life in the Valley. The stability of the economic base was, in turn, linked with the stability of the water resources. According to the description in the local Gazetteer, Dehradun enjoyed ‘... an unusually copious rainfall, and owing to the physical configuration it is seldom that the monsoon is an entire disappointment. In addition to this climatic advantage, hitherto unknown, considerable tracts of the Doon are ensured against crop failure by the canals.\[^3\] The impact of quarrying on agriculture is most appropriately assessed within the ecological units formed by the catchments of different streams draining the Mussoorie Hills, and the command areas of canals fed by them. The Katapathar command area provides an example of an agricultural economy within the Valley which is not affected by quarrying, as this canal draws its water from the Yamuna.

As already discussed, the traditional agricultural impact of quarrying is the destruction of land and water resources, both of which are very important inputs for food production. Also, as explained earlier, abundant rainfall combined with stable catchments provided by the Mussoorie Hills had earlier formed the most important base for a stable agricultural economy in the Valley. The landscape had been cleared of its green cover, which was 70% in 1960 and remained only 10% by the 80’s \[^3\]. Movement of heavy motor vehicles which carry the mined out material also affect the condition of the road in the valley. The deterioration of the resource base had damaged food production. In most of the villages that lie below quarries, the irrigation channels had been destroyed by the flow of deposits and other debris from mines or from mining roads.\[^2\]

The destabilization of the resource base has destabilized food production. In most of the villages that lie below quarries, the irrigation channels have been destroyed by the flow of silt and other debris from mines or from mining roads. Village Bhitarli in the Tons catchment was self-sufficient in foodgrains and had surplus food and milk production before the quarrying operations destroyed the food and fodder base of the village. But the submersion of the irrigation channels led to a drastic reduction in food production, and the loss of grazing land has decreased the cattle population.\[^3\] The entire area below the limestone belt can no longer be used for grazing, and large areas have practically no vegetation as they are covered by debris from the mines. The few pockets of shrubs and forest that remain are of no use for cattle, because of the perpetual danger of boulders rolling down the slopes as a result of blasting. An important economic activity based on animal husbandry is therefore being eroded, and the decline in cattle population in areas affected by mining is as much as 40 per cent. The decline in livestock population affects the production of milk, the production of energy for farm operations, and the production of animal dung that provides soil fertility for sustainable agriculture—the last function being the most important one in hill agriculture. Quarrying affects agricultural activity not only in the villages in the vicinity of the quarries but also in the villages in the other parts of the Valley served by the canal network. As indicated earlier, destruction of the hydrological stability of the region means that there is less water than was previously available for irrigation when it is most needed. The increasing difficulty in the distribution of water interferes with the timely availability of irrigation water, and this leads to increased crop failure.\[^2\] The growing of Basmati rice, famous for its flavour, is on the decline in the Valley, thus reflecting the failure of the Valley to utilise its relative advantages of climate and water resources. In an early Settlement Report it was stated that ‘the canals are, without doubt, the making of the Doon.

**EXPECTED OUTCOMES**

Since it is a known fact now that industries are the main culprits for the deterioration of the doon valley especially mining. Through this study a picture of the whole history of mining in the valley has been created with all the major incidents which took place over time. Analyze the policies made by the government to protect the valley, whether they were successful or not, the effects of mining on air, water and land resources. Abandoned mines in the region and their effects on the surroundings and possible measure which can be taken up to rehabilitate them and to make them productive in any other manner for the society. The focus is also on the status of illegal sand mining going on in the area. Those areas have been identified with the help of the reports from the newspaper reports and the effect of that on the water body are also brought into light.

**OBSERVATIONS**

The mining activity some how interferes with the local ecological balance. It has far reaching consequences for the society. The mineral is also needed by the society hence a balance has to be struck between the needs of the society and environment. The mining may go hand in hand with the concern for the preservation of environment and mineral exploitation. The mining may be welcome if it causes least damages and these damages can be compensated reasonably.

After reviewing the status of mining and other industrial activities there are several observations made in these sectors which are expressed here separately

**LIMESTONE MINING**

Limestone mining in the valley was once a major source of economic benefits and revenue generation for the state government. It was also a very profiting business for the contractors. It also provided employment to the villagers in the valley but all this was at the cost of the forests and natural resources of the valley which is far more important than the money which was being made by sacrificing it.
Limestone quarrying was done in many parts of the valley some of them are listed below:

- Haathipaav
- Lambidhaar
- Kumaldha
- Nehargaanv

There were a total of 62 mines in the valley, Lambidhar mining area near Mussoorie was one of the biggest mines in the valley.

At present there is a total ban on limestone mining in the valley or mining of any other mineral for that matter. This ban was imposed by the Apex court of India (Supreme Court). After the ban the environment of the valley started to improve significantly over time. The supreme court also gave orders for the restoration of damage caused to the valley because of mining and formed a committee to look after it.

ABANDONED MINES

After the ban on Limestone mining the mining contractors abandoned the mines. In the fragile ecological system of Doon valley, limestone had been exploited extensively. Some studies had been made to assess the damage due to mining and the strategy to control it. In and around Mussoorie hill there were over one hundred small and big mines. Most of the mines were degrading the fragile ecosystem as the working had been most unscientific. There were visible ugly scars of mining on the hills and it was a cause of public protest. The Govt. of India examined the issue and the supreme court ordered the closure of mines to save the Doon valley from degradation. Govt. of India also declared this area ecologically fragile and hence to be preserved. After the supreme court ruling over this case many of these mining areas were abandoned. These abandoned mined out areas impose many threats on the environment as they are stripped of vegetation and top soil these areas are subject to frequent landslides. The supreme court did take notice of this problem and ordered the afforestation of the mined out areas these efforts have fulfilled the immediate objective but have failed to inculcate sustainability concept with economic viability of the mined out areas. "Good earth" capable of sustaining the population around. It can be done by finding economic uses for the mined out areas and to implement schemes which may be economically viable and may provide livelihood to numerous persons who may be jobless due to closure of mines. Though most of these mines were closed down after the supreme court intervened in 1982 the mining activities still continue illegally in the valley. After the supreme court banned mining activity in the valley the mines were abandoned by the contractors. Unscientific mining and non-adoption of proper rehabilitation measures in most of the abandoned mine sites in the valley have created the problems of denudation, shifting mass of land and rubble, pollution of soil, blockades of roads and reduction in water holding capacity of streams. These abandoned mines also are becoming target for the limestone contractors for doing illegal mining, village Tapovan and Sahastradhara are the places in the valley where illegal mining activities have been seen, even in the jakhan and rajpur area of the valley such activities are said to be going on. During the period after the ban on mining, the State Govt. took some measures with a view to rehabilitate the mined out areas. After the closure of old mines by early nineties, the State Govt. deployed eco-task force to biologically rehabilitate the mined out areas. The following steps were undertaken:

- Check dams to arrest erosion
- Planted shrubs to stabilize the ground
- Planted trees to rehabilitate the area biologically

The abandoned Lambidhar mine of UPSMDC undertook many good measures to rehabilitate the area biologically and now the hill feature is no more desolate. Many other mines were taken care by the Eco-task force and with the efforts so far made, the entire Mussoori hill has become green and ugly scars of mining have disappeared.

The mining companies, specially the subsidiaries, of Coal India Limited and NMDC also did a commendable job in many areas. The waste dumps have been rehabilitated. Certain iron ore mines of Goa also rehabilitated waste dumps and implemented plans for revergatation of mined out areas. The philosophy of post mining eco-system regeneration was generally related to vegetation and that too to grow fast growing species. Possibly these efforts have fulfilled the immediate objective but have failed to inculcate sustainability concept with economic viability of the mined out areas. The pre-mining lands might have been very fertile and might have maintained the population there in. The mined out area is still the same and is capable of sustaining the population around. It can be done by finding economic uses for the mined out areas and to implement schemes which may be helpful in bringing the mines to a better use.

POSSIBLE COMMERCIAL APPLICATION

The old and abandoned mines may be either open cast or underground as most of the mining in the valley was open cast but the contractors dug deep in some hills which is also a illegal practice but had been done so underground mines also exist in the valley . Both types of mines can be used for commercial activities after suitable reconditioning. In the following paragraphs some commercial issue are suggested.

Open cast mines

These mines after, mineral exploitation look like vast stretches of degraded land. In the hilly terrain the mining scars may be along a hill feature, on top of it or in between the hill mass. In the plain areas, it may look like a huge depression traversed by winding roads, benches and flat areas. It may be possible to use these mines for the following purposes, topography wise.

Hilly areas

In the hills any area flattened by mining activity is a land which is readily available for colonisation, resort building, helipad and even air strips. It may be possible to conduct mining operations in such a fashion as to carve out an area to suite specific after
use. It may also be possible to alter it marginally to be of some economic use. Any abandoned mining area gets biologically and socially rehabilitated if it is used for some societal purpose with economic benefits. Stepped farming may be one of the uses. The lands are very suitable for sericulture and floriculture due to good climatic conditions.

**Plain areas**

Most of the mines in the valley are open cast. The open cast mine in a plain area being a depression attracts rain water and a huge water body is formed subsequently. This water body can be used for pisciculture or for recreational activities, such water bodies can also be used for developing a fresh water resort. The flat areas, like benches, can be reconditioned for vegetation by soil blanketing. The soil cover of 300 to 400 mm may help in sustaining grass, shrubs and vegetable plants. These are cash crops and may be remunerative to the local population. The water stored in the depression can be used for lift irrigation to help the growth of cash crop. There is a need to have a re – look at the prevailing practice of planting fast growing trees which suck ground water and the wood produced has practically no use except as fire wood and paper and pulp industry. There is thus a need to experiment with flowering and fruit bearing vegetation. The products may have economic value and may provide gainful employment to the closure affected persons. It may also generate revenue to the Govt. Use of mined out area for gainful purpose may automatically rehabilitate the area and the people may involve themselves. The Govt. may therefore not to provide financial assistance for the purpose.

**Underground mines**

Underground mines can be used by the society in many ways as follows:
- Storages for drinks
- Storage of oil
- Cold storages
- Mushroom cultivation
- Sericulture and floriculture
- Compressed air energy storage

These underground mines can also be used for growing mushrooms as the experiments conducted in the past have revealed that mushroom can grow in these conditions. Mushroom cultivation appears to be a very promising commercial use of abandoned underground mines. In our country we want to increase the mushroom output as its consumption is growing. The abandoned mines provide ready made space for mushroom cultivation. There is thus a need to encourage this activity and there could not be any better place than the Doon valley to do this.

**Constraints in the use of Abandoned Mines**

The mining is a hazardous activity done under regulated conditions. After the mineral gets exhausted on exploitation and hence no more profitable mining is abandoned. Technically, the abandoned mine shall get reverted to state and the state may find ways to use it commercially. Currently, many abandoned mines have been left as such. The surface mines are being further degraded by weathering action. The underground mines are turning to be hiding places for criminals or for illegal mining. These activities are harmful to the society. The law and order mechanism may or may not help in improving the conditions. If these mines are put to economic use, it may help in solving many problems. The antisocial activity may cease, the persons may get alternative source of livelihood, the Govt. may get revenue and in doing so an abandoned mine is rehabilitated automatically.

**THE ISSUES**

It may be possible to look into the problem in more details and to evolve strategies. The law provides for reclamation and rehabilitation of abandoned mines. The environment act stipulates the detailing of after use of mined out areas and asks for plans for restoration and strategy to accomplish it. More law may not be very much helpful as the rehabilitation of abandoned mines is a losing activity. No mining company may do it. There is, therefore, a need to evolve some strategies. The land after the mining operations gets reverted to the state, but in practice it remains as such for want of a caring owner or tenant. The mining company, though under obligation to restore the mining area, may not do it due to the fact that its attention gets diverted elsewhere and may not have funds to spare. what UP Govt. did for Doon valley is exceptional but what it failed to do was that it could not bring these mines to commercial use. Although what it did must be appreciated but not to forget that it was done because of public pressure and judicial intervention.

There is lack of awareness on the part of common public about the state’s responsibility, hence there is a need to educate public. The public hearing clause of the environment act added recently may be helpful and it will also be easy in the case of Doon valley as the people of the valley are already aware of the situations around them and are ready to make it better. The commercial use concept is to be taken up on a sustained basis. There is a lack of infrastructure to do so. The crop which may be grown may have to be processed for market and its collection, dispatch and sale is to be done. For mushrooms, flowers and fruits, preservation and processing plants may be needed. The issue therefore needs careful evaluation and planning.

**POLICY INITIATIVES**

As we have mining policy we should have a policy for use of abandoned mines also. A separate guidelines may have to be evolved for transfer of mines from the mining companies to another beneficiary who may use the areas profitably. This agency should have clear mandate and adequate supervisory authorities to reorient the abandoned areas for commercial use. Both the surface and underground mines had been working under set safety regulations and the conditions for observing them still remain even after the cessation of mining operations. We may therefore have to evolve regulation which may be necessary for the safety of the persons working in the abandoned mines.

It had been a common practice to use the land as right of
way for railways, highways and power transmission lines. The use of such land is prohibited by law but of late certain dilution is being done. The land below the power transmission lines is now being permitted for cultivation and low level activities. On the similar lines the safety regulations of underground mines can be slackened to undertake the demonstrative cultivation of mushrooms in abandoned area of underground mines. The use of underground space as storages and Ware House may be encouraged. It can be done by strengthening and modifying sections of old over ground mine to suite the new users. The ware housing companies may be involved in the exercise to evolve use of underground space.

What can be done to an abandoned mine is best known to mining engineers. However, the other sections of society have no idea. There is thus a need to discuss the matter with prospective users like, ware housing companies storing various goods, municipal authorities storing water and industries looking for more space for expansion of their activities, specially the farming and tourism sector.

An inventory of the abandoned mine space be made and the information be analysed to identify the mine for a specific use. Some demonstration projects be undertaken and the local population and NGO’s be involved in the exercise. Area wise nodal agency may be constituted which may help in development of infrastructure, marketing and processing. Such a set up be encouraged as is being done for other industries by offering incentives in the form of tax concessions, low rate power supply and financial help. It is strange that in most of the states mining is not an industry.

Minor Mineral Mining
Sand mining disturbs the equilibrium of a river channel because it intercepts material load moving within a dynamic system and triggers an initial morphological response to regain the balance between supply and transport. As we know, there are many small and big rivers which flow through the valley which makes it a prime location for mining of sand from river beds.

Mining for the extraction of minor minerals like sand, Boulder etc is currently going on in the valley. Garhwal Mandal Vikas Nigam is the government body which is facilitating these mining operations in the valley by giving out leases to private contractors for mining.

These sand mining operations are being carried out in a systematic and environmentally friendly manner. Since the authorities have already seen the negative effects of such activities on the environment of the valley they are taking all the precautions so that sand mining doesn’t damage the rivers much. Doon valley is also an eco-sensitive zone and many NGO’s and other public organizations have a close eye on the activities happening in the valley which is also a major factor which is forcing the authorities to keep these mining activities under strict supervision and prevent them from damaging the environment in the valley.

All these mining operations are open cast mining which are confined to extraction of sand, bajri and boulder from the river beds. The operation will be manual with use of hand tools like shovel, pan, sieves, etc. Sand is separated from bajri and boulders by sieving process. Excavation will be carried out to a maximum depth of 1.5 meters.

Extraction of sand, bajri and boulder material will be done only during the day time and completely stopped during the monsoon season.

At present sand mining is going on in the river beds of rivers named below –
- Aasan river (Khushalpur, Premnagar, Purohitwala)
- Yamuna river (Dhakrani, Dhakpattar)
- Jakhan river (Jakhan)
- Tons river (Ghaziawala)
- Song river (Kaluwala, Baxarwala, Dohiwala, Gullarghati, Raipur).

There have been some reports of illegal sand mining too which have been discussed in the later part of this paper.

Illegal Mining
If u ask the authorities of Dehardun it is a straight answer that mining in Doon valley is completely stopped but in reality there have been frequent reports of mining still going on the valley illegally. The mining areas are located in thick forests in the Tehri Garhwal district within the Doon valley which were saved from destruction by the Apex court through several orders from indiscriminate limestone mining in 1983 on a public interest petition by the Rural Litigation and Entitlement Kendra, a non-governmental organisation.(Indian express 1998). The word is that the contractors have been carrying on limestone mining on the strength of orders allowing them to extract and remove material by the High Court, district court or by the area district magistrate which still is illegal because these activities have been carried out without the prior sanction of the Central Government and as per Section II of the Forest (Conservation) Act, 1980 - no forest land or portion of it should be diverted to non-forestry purposes without Central government’s prior approval.

Apart from these a Paper written by Miss Neha Bahl for which she conducted some field surveys in the valley and reported that illegal extraction of limestone through burning it in kilns is still going on in some areas of the valley especially in villages of Jakhan and Rajpur.[2]

These reports were only about illegal mining of limestone in the valley but very recently there have also been reports and complaints about illegal sand mining by local contractors in the river beds of river Rispana.

The whole matter is that recently the Garhwal Vikas Mandal Nigam gave contracts to private contractors for the clearing of debris and removal of silt from the river. On the name of cleaning the contractors started sand mining in the river and the actual work for which they were hired has not been done.

LIMITATIONS
The main limitation in the study is the availability of data as the
data regarding illegal mining cannot be obtained since it is not there on paper only the information gathered by primary surveys or with interviewing the people can be used. Manpower is also a constrain since for conducting the primary surveys of the site more number of people are required so most of the information used in the paper will be from secondary sources. Time limit of three months is also a constrain as the conclusions need to be drawn within this short period of time which will narrow down the focus of the study.

CONCLUSIONS

Quarrying in the doon valley has disturbed the ecosystem drastically in the past. the limestone belt in the Mussoorie Hills lies in a tectonically active zone, and a geological thrust was created by the extension of the older pre-tertiary rocks of the Mussoorie Hills over the younger tertiary rocks of the Doon Valley. The thrust is disturbed by a series of o&hoot faults, rendering the region geologically unstable.

The actual process of extraction of limestone thereafter created the second ecological impact on land resources, which is unique to the fragile and sensitive ecosystems that characterize the Doon Valley. The use of explosives to remove the rocks further weakened the already weak rock structure. Explosives also activate faults in the dislocation zone of the main boundary thrust, where the quarries in the Mussoorie area were located. The result were clear induced slope failure and landslides, which increased in the region since the mining operations began. It is good that the aware citizens of the area took notice of these problems and took steps to prevent it and they succeeded to in doing that. After the ban on mining in the valley the environment of the valley has improved a lot and the greenery which was lost due to quarrying activities can be seen restoring itself in the valley. The whole event of limestone quarrying and the struggle related to it is a success story and the people of the valley who stood up against this environment degrading practice need to be appreciated.

Abandoned Mines

The abandoned mines are a social responsibility, there is need to bio-logically rehabilitate them for social well being. In India the land available is limited, hence the use of abandoned mine for commercial activity may be most welcome. There is a need to systematize the activity by creating an agency to look into the matter and to provide a viable medium for interaction with the mining companies and the prospective users of mined out areas. Some legislative and administrative steps have been taken up such as provisions in mines safety regulations for use of underground space but there is still a need to come up with such strategies which help in bringing out the commercial use and value of the mines after they are closed and abandoned so that they may prove useful and provide some sort of employment to the people of the area, as many of these people became unemployed after the closure of these mines. The society’s involvement in the process may also be very useful as it may help in rehabilitating the mined out areas.

The abandoned area after mining may not have any economic value hence may lie as degraded land. Such a land is an ugly scar on the face of the earth and the excavations are prone to further degradation and erosion due to the natural process of weathering. During the mining operations, the blasting shatters the rocks in the vicinity and the induced fractures weaken the rock further. Such a rock mass is prone to progressively accelerating erosion process, which may spread fast to the adjoining areas.

A few alternatives by which these mines can be rehabilitated are suggested here.
Surface Mines
The models may be related to converting the abandoned mine to agricultural land. It may support crops, fruits and vegetable growth and the bottom of the pit may store rain water for pisciculture and lift irrigation to support the crops above. It is possible to prepare a detailed scheme for a selected mine. This may include salient features, likely problems to be encountered, infrastructure needs and the waste management. The model may also suggest methodology, probable coast and the contract arrangement etc for the actual work.

Underground Mines
The underground mines can be developed as stores and mushrooms cultivation as suggested earlier. This again requires to select a mine for rehabilitation and after through study a plan can be prepared. The model adopted is to be coherent with the mined out areas so that the implementation is possible. It is possible to develop replicable models category wise which may ensure implementation under a given condition.

AREAS OF FURTHER INVESTIGATION

Illegal mining
This is probably the sector which requires further more investigation, since due to some limitations i.e. data availability etc any solid conclusions could not be made in this paper. Although it is clear that illegal mining is going on the valley to some extent all what is needed is more strict administration and monitoring by the authorities in the valley.

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DHAPA DUMPING GROUND, KOLKATA

AN ASSESSMENT OF THE DUMPSITE AND POSSIBLE OPTIONS FOR POST CLOSURE LAND USE

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TATA INSTITUTE OF SOCIAL SCIENCES, MUMBAI.
ABSTRACT

Dhapa Dumping ground, the main lifeline of Kolkata’s municipal solid waste disposal is now under the process of being shut down and the initial talks about the remediation process are under way. Given the kind of land use that exists in and around the dumpsite i.e., (East Kolkata Wetlands and agricultural land), its crucial to find a suitable use for the land which will be available once the remediation process is over and the post- closure care and plans have been put in place. How successful will the remediation process be and what will be the impacts is an important question, however, this will require greater understanding of the technical aspect of the project which will not be the scope of this research study. However, through this report a broader perspective is studied resulting from land use patterns, laws and by laws of the wetlands, the city and the fundamental elements that bring the wetlands, the agricultural land and the dumping ground together towards bringing a certain functionality to the city.

There have been certain proposals laid out as to what should be the fate of the dumping ground after closure. Thus this report brings together examples of various land uses of former dumping grounds across the world, and an attempt has also been made to understand the situational settings in which the land use plans were made and to apply them to the situational setting of the Dhapa Dumping ground.

INTRODUCTION

Solid waste management in the recent years has become a critical issue both in the developed as well as in the developing countries. With the population rising as well as the amount of waste generated and the change in the composition of solid waste, have all contributed to the crisis that we are faced with today. The Ministry of Urban Development, Government of India, in its manual on solid waste management for the year 2000 estimated that India’s total waste generation amounted to about 100,000 million tonnes (CPCB, n.d.). With help from NEERI, the Central Pollution Control Board (CPCB) had conducted a survey on solid waste generation in 59 cities across India for the year 2004-2005.

In the year 2004-05, Kolkata with a population of 45, 72,876 generated a total of 0.58 kg/c/day of waste. Another city which is almost the same size as Kolkata, is the city of Chennai with a population of 43, 43,645 living in an area of 174 sq m and generating a total of 0.62 kg/c/day of waste.

KOLKATA

The city of Kolkata is the capital of West Bengal located in the Eastern region of India. Kolkata lies off the eastern bank of the river Hugli, a tributary of the river Ganga. The Kolkata Municipal Corporation (KMC) the local self-government of Kolkata, provides the city with services in the form of water supply, basic primary health care services, sewerage and drainage, maintenance of parks and gardens, street lighting and solid waste management. KMC administers to a total area of 187 km 2 which is divided into 141 wards which are further grouped into 15 Boroughs.

For effective Solid Waste Management service, each ward of the KMC area is divided into 7 to 10 blocks and each block is then provided with 8 – 10 sweepers and the main process of garbage collection is door-to-door collection, which covers a total of 50% of all the 141 wards (KMC, 2013). The rest of the collection is either through direct loading, street sweeping etc. According to a report compiled by the KMC, the total amount of solid waste collected is 2910 MT (Avg.) with respect to the 3000 MT (Avg.) of solid waste generated per day (KMC, 2013).

The collected solid waste is dumped at two open dumpsites i.e., Dhapa covering an area of 24.71 hectares and is at a distance of 20 km from the city. The other dumpsite is located in Garden Reach, which is about 22 km away and covers 3.22 hectares (KMC, 2013).

COMPOSITION OF MUNICIPAL WASTE IN KOLKATA

As mentioned earlier, the KMC owns all the Solid Waste Management assets/infrastructure in the city of Kolkata and this service is rendered free of cost to the residents of this city (Chakrabarti, 2013). According to the KMC, SWM Department, waste generated by households comprise approximately 55% of the total waste generated and the rest is generated by commercial, institutional and others. With the markets too generating a large amount of waste, it has been assumed the per capita per day generation of solid waste is 650 grams (Chakrabarti, 2013). This amount comprises of all waste generated, other than from office and other establishments.

From the above figure it is clear that more than half of the total waste generated in the city is biodegradable, 33% comprises of inert materials and 16% comprises of recyclable material. This recyclable material includes green coconut shells, paper, plastic, metals, glass and crockery (Chakrabarti, 2013). What clearly comes across in this data is that more than 50% of solid waste is biodegradable and contains waste from households of fruits and vegetables and that of markets which contain 32.37% leaves, hay and straws, 25.71% fruits and vegetable waste and 7.96% coconut shells (Chakrabarti, 2013).

A survey conducted by KEIP on chemical analysis of municipal solid waste of the KMC area, revealed that moisture and organic matter which comprise 78% of the waste, are the two main components in the city’s waste. The high moisture content is most probably due to the high proportion of fresh and unprocessed vegetable waste, combined with high humidity which the city experiences during the summer months (Chakrabarti, 2013).

So far there has been no estimate about the amount of recycled material at source. Traditionally, recyclable material like newspaper, cardboard, glass bottles, plastic bottles are kept separately and are collected by rag pickers. Of the total amount of recyclable waste material that is transported and dumped at the Dhapa Dumping ground, approximately 4% of the recyclable material is recovered by rag pickers at the dumpsite (Chakrabarti, 2013). However there is no estimation about the number of rag pickers working at this dumpsite or in and around the city.

Of the total biodegradable waste about 300 tons of this
**TABLE 1: SOLID WASTE GENERATION IN 59 CITIES**

<table>
<thead>
<tr>
<th>S. No</th>
<th>Name of City</th>
<th>Population (As per 2001 census)</th>
<th>Area (Sq. Km)</th>
<th>Waste Quantity (TPD)</th>
<th>Waste Generation Rate (kg/c/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kavaratti</td>
<td>10,119</td>
<td>4</td>
<td>3</td>
<td>0.30</td>
</tr>
<tr>
<td>2</td>
<td>Gangtok</td>
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<td>15</td>
<td>13</td>
<td>0.44</td>
</tr>
<tr>
<td>3</td>
<td>Itanagar</td>
<td>35,022</td>
<td>22</td>
<td>12</td>
<td>0.34</td>
</tr>
<tr>
<td>4</td>
<td>Daman</td>
<td>35,770</td>
<td>7</td>
<td>15</td>
<td>0.42</td>
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<tr>
<td>5</td>
<td>Silvassa</td>
<td>50,463</td>
<td>17</td>
<td>16</td>
<td>0.32</td>
</tr>
<tr>
<td>6</td>
<td>Panjim</td>
<td>59,066</td>
<td>69</td>
<td>32</td>
<td>0.54</td>
</tr>
<tr>
<td>7</td>
<td>Kohima</td>
<td>77,030</td>
<td>30</td>
<td>13</td>
<td>0.17</td>
</tr>
<tr>
<td>8</td>
<td>Port Blair</td>
<td>99,984</td>
<td>18</td>
<td>76</td>
<td>0.76</td>
</tr>
<tr>
<td>9</td>
<td>Shillong</td>
<td>1,32,867</td>
<td>10</td>
<td>45</td>
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</tr>
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<td>10</td>
<td>Simla</td>
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<td>39</td>
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</tr>
<tr>
<td>11</td>
<td>Agartala</td>
<td>1,89,998</td>
<td>63</td>
<td>77</td>
<td>0.40</td>
</tr>
<tr>
<td>12</td>
<td>Gandhinagar</td>
<td>1,95,985</td>
<td>57</td>
<td>44</td>
<td>0.22</td>
</tr>
<tr>
<td>13</td>
<td>Dhanbad</td>
<td>1,99,258</td>
<td>24</td>
<td>77</td>
<td>0.39</td>
</tr>
<tr>
<td>14</td>
<td>Pondicherry</td>
<td>2,20,865</td>
<td>19</td>
<td>130</td>
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<tr>
<td>15</td>
<td>Imphal</td>
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<tr>
<td>16</td>
<td>Aizwal</td>
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<td>Jammu</td>
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<tr>
<td>18</td>
<td>Dehradun</td>
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<tr>
<td>19</td>
<td>Asansol</td>
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</tr>
<tr>
<td>20</td>
<td>Kochi</td>
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<td>400</td>
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<tr>
<td>21</td>
<td>Raipur</td>
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<td>184</td>
<td>0.30</td>
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<tr>
<td>22</td>
<td>Bhubaneswar</td>
<td>6,48,032</td>
<td>135</td>
<td>234</td>
<td>0.36</td>
</tr>
<tr>
<td>23</td>
<td>Tiruvanantapuram</td>
<td>7,44,983</td>
<td>142</td>
<td>171</td>
<td>0.23</td>
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<tr>
<td>24</td>
<td>Chandigarh</td>
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<td>326</td>
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<tr>
<td>25</td>
<td>Guwahati</td>
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<td>218</td>
<td>166</td>
<td>0.20</td>
</tr>
<tr>
<td>26</td>
<td>Ranchi</td>
<td>8,47,093</td>
<td>224</td>
<td>208</td>
<td>0.25</td>
</tr>
<tr>
<td>27</td>
<td>Vijaywada</td>
<td>8,51,282</td>
<td>58</td>
<td>374</td>
<td>0.44</td>
</tr>
<tr>
<td>28</td>
<td>Srinagar</td>
<td>8,96,440</td>
<td>341</td>
<td>428</td>
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</tr>
<tr>
<td>29</td>
<td>Madurai</td>
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<td>275</td>
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<tr>
<td>30</td>
<td>Coimbatore</td>
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<td>107</td>
<td>530</td>
<td>0.57</td>
</tr>
<tr>
<td>31</td>
<td>Jabalpur</td>
<td>9,32,484</td>
<td>134</td>
<td>216</td>
<td>0.23</td>
</tr>
</tbody>
</table>
waste is collected from local markets and taken to the Dhapa Compost Plant. This compost plant located adjacent to the Dhapa dumping ground, named, M/S Eastern Organic Fertilizer Ltd has a capacity of 500TPD and functions on Build Own Operate & Maintain (BOOM) basis and applied the ‘windrow system’ of composting. However, the composting plant is not presently functions up to its optimum capacity and a site visit revealed that the plant which was commissioned in 2000, is not under operation anymore due to lack of raw material of a required quality and quantity.

**DHAPA DUMPING GROUND**

The Dhapa Dumping area has been in use as a disposal site for almost 200 years(KEIP, 2013), however the KMC took over its operations in the year 1987(COWI, August 2013). The dumpsite comprises of two areas within Ward no. 57 and 58. The dumping ground was to last only for 20 years, however, lack of any alternative disposal site, resulted in continual disposal of municipal solid waste on this site. The dumpsite reached its full capacity, i.e. its saturation point about 10 years ago and the mountain of garbage now stands at a height of 23m(Ghosh, 2014). The present method of disposal of waste is neither sanitary or a controlled method of landfilling, since neither the waste is systematically placed nor covered with earth and compacted in thin layers of 200 to 400mm.

The concern over the status of the Dhapa dumpsite has been there for many years and the KMC has engaged with several
consultants to find an economically and environmentally viable solution for the closure of the landfill (Dhapa), and at the same time ensure that Kolkata’s future municipal solid waste disposal needs are met through more financially sustainable and economical and environmentally viable options (SNG Mercantile Pvt. Ltd; Gartner Lee Ltd, 2006). Finally in 2009, in compliance with the East Kolkata Wetland Management Plan, the smaller existing Kalmibani-Makaltala dumping site, covering an area of 8.2 hectares was identified for closure and rehabilitation. The remaining landfill of a larger area is still active, however, only for a year more, before it too will be in need of immediate closure. Thus the immediate prerogative of the KMC has been to not only provide for a safe closure of the Dhapa dumpsite but also to find a solution to the ever increasing volume of solid waste that needs to be disposed off.

Unable to find an alternative land parcel to be used as a landfill site, the KMC decided to build a new dumping ground near the existing Dhapa dumping ground. KMC identified 113 hectares of land for which the Asian Development Bank was to fund Rs. 8 crore for the project under the Kolkata Environment Improvement Project (KEIP) scheme for building a new sanitary landfill. However for this project to take place, the KMC had to acquire agricultural land from 500 farmers. These farmers refused to part with the land in spite of being given a considerable amount of money as compensation (Ray, 2010). If such a proposal was agreed upon, then the KMC would have had to pay Rs 9.39 crore as compensation to the farmers. The cost for a bigha of cultivable land is Rs 9.10 lakh and for a water body is Rs 7 lakh (The Telegraph, 2014).

With the city continuing to grow and population to continu-
ously rise, waste generation is only going to increase. A report submitted by the Solid Waste Management department of the Kolkata Municipal Corporation (KMC) put together data on projected values of population as well as waste generation within the KMC area, starting from the year 2013 upto 2035. It projected that with a population of 4,824,833 the total waste projected to be generated was 3178.98 MT per day in 2013 and by 2035 it is projected that population will increase to 5,268,304 and the daily waste generation would be 3465.86 MT(Solid Waste Management Department, KMC, 2014).

Recent developments regarding this issue have been that the KMC has coordinated with the Housing Infrastructure Development Corporation (HIDCO) and have found a 20 acre plot in Rajarhat, New Town which will act as an alternative site to the existing Dhapa dumpsite(Saiikat Ray; Suman Chakraborti, 2014). The proposal by the KMC is to construct Eastern India’s most modern sanitary landfill(TNN, 2014). The JNNURM has sanctioned an amount of Rs 152 crore for the waste collection and disposal management of the city. However, the Centre has given the officials an ultimatum that the project needs to be completed within the next 18 months, failing which the Centre will be forced to withdraw the funds(TNN, 2014).

**MOTIVATION**

Under the Municipal Wastes (Management and Handling) Rules, 2000 Schedule III section 31, it says that ‘post- closure care of landfill site shall be conducted for at least fifteen years and long term monitoring and care plan...’ should be implemented.

A Danish consultant, namely COWAI1 has come out with a detailed project report of the design criteria for the remediation of the dumpsite as well as an environmental and social assessment report with regard to the technology proposed to be used.

However, recent literature has revealed that other remediation processes like Bio-mining have also been successfully implemented at cheaper costs and in much shorter periods of time in several Indian cities like Pune, Hyderabad etc.,(Patel, 2007).

Other factors like that of the bone processing unit which is located adjacent to the dumpsite is another cause for environmental risk. It is not part of the remediation project however the total recovery and rehabilitation of that area is also largely influenced by the operations of this factory.

What makes this dumpsite unique is the fact that it is located within the East Kolkata Wetland which comprises of a large number of water bodies. The East Kolkata Wetlands are a multifunctional wetland ecosystem covering over 12,500 hectares in the districts of 24- Parganas North and South, in the state of West Bengal(Nitai Kundu; Mausumi Pal; Sharmistha Saha, 2008). It provides for the world’s largest wastewater fed aquaculture system, garbage farming2 and most importantly a cheap and eco-friendly system of treatment of solid waste and sewer water released from the city of Kolkata.

Further the dumpsite is clearly not in the outskirts of Kolkata but rather in the heart of Kolkata with numerous real estate projects operating in the vicinity, for example, J.W. Marriott, Silver Springs etc. Therefore any impact of the closure of the dumpsite, whether positive or negative is going to affect not only the ragpickers, fishermen, residents of the villages nearby, but also affect and determine the fate of hotels and other real estate projects in the area.

Recommendations have been made by the Kolkata Municipal Corporation to convert the dumping ground into a bird sanctuary. Another a proposal going around the KMC office is that of converting the dumping ground into a golf course. However, this proposal is still at its nascent stage and seems to be coming from those who have vested interests with the real estate lobby. As of January 20, 2014, the proposal on the bird sanctuary was approved in the Member, Mayor-in Council Meeting. However, commendable this proposal maybe, care needs to be taken to make sure that the remediation project is completely successful in clearing of all harmful elements such that the area is devoid of any contaminants which might threaten the flora and fauna in the area. The ecosystem is fragile and thus restoration of the area is vital.

With the East Kolkata Wetlands (EKW) having been given Ramsar accreditation and the Government passing an Act in 2006 for the Conservation and Management of these wetlands, it is but hopeful that the bird sanctuary could be considered part of this agreement. The draft report on the Conservation and Management Plan of East Kolkata Wetlands, submitted by the East Kolkata Wetlands Management Authority (EKWMA), states that the ’Non-Core wetland area’ which comprises of the agricultural land and the settlements around the area are all an integral part of the East Kolkata Wetlands and will be governed under the guidelines of the EKWMA, the EKW Act and other relevant policy directives(EKWMA, n.d.).

With such a development already in place, it is but hopeful that a successful remediation process of the dumpsite could turn into a bird sanctuary thus proving to be an example of sustainable management of a closed dumpsite.

With a proposal for conversion of the dumping ground into a bird sanctuary there clearly needs to be a study on such a project keeping in mind the numerous stakeholders, such as the farmers, fishermen, rag pickers, hoteliers etc. that will be impacted through such a project as well as making sure that such a project is done in the best interest with respect to the East Kolkata Wetlands (Conservation and Management) (Amendment) Act, 2011 and the Ramsar Protocol.

**OBJECTIVES**

- To study various examples of waste management practices in India and abroad that have resulted in the restoration of the

1 COWAI is a leading international consultancy firm that is active on five continents in the areas of engineering, environmental science and economics.

2 Garbage farming refers to solid waste being reused as compost for urban agriculture. The Dhapa area provides the city with almost 147 tonnes of vegetables every month.
environment to its former glory or have resulted in alternative land uses from the dumpsite.

Under this objective the aim will be specifically to look at the international cases like the Mariannhill Landfill Conservancy in Durban, South Africa and Bobbingworth Nature Reserve, United Kingdom which have been successful in remediation of former landfill sites. On the national front sustainable solid waste management practices have been in the form of ‘bio-mining which have been implemented in cities like Madurai, Hyderabad and Pune. A study of these processes may give a clear idea of the circumstances under which these processes were implemented and the kind of hurdles that had to be overcome in order to achieve their goals.

- To determine what are the alternative uses of the available land after the safe and secure remediation of the Dhapa landfill site in accordance with the Land Acquisition Act and the East Kolkata Wetlands (Conservation and Management) (Amendment) Act, 2011, since the dump site lies in the territory of the East Kolkata Wetlands. (A general idea of the various alternative land uses that have been developed around the world will be provided as an introductory paragraph to this section).
- Study the existing land use pattern around the dumping ground and the likely impacts it may have on the bird sanctuary.

A look at the existing land use map of Kolkata, specifically the area around the dumpsite to see if there will be any significant impact on the bird sanctuary and vice-versa.

- An attempt will be made to specify what might be the possible hurdles that may need to be overcome in the process of attempting to establish the bird sanctuary. This will include both the stakeholders’ point of view as well as that of the administrative point of view. The various stakeholders at this stage include the farmers in the vicinity, ragpickers, the East Kolkata Wetland Management Authority, fisherman, city environmentalists and the Kolkata Environmental Improvement Project Unit.

- To determine what has been the impact of closing down the dumping ground till now.
- To formulate a way for the project to prove worthy not only in terms of conservation and preservation of the environment but also as a source of revenue for the Kolkata Municipal Corporation. Thus the outcome of this research will aim towards finding greater economic value to natural resources.

**METHODOLOGY**

The study will be conducted through a case study approach, the case thus being the Dhapa Dumping ground. This will allow for the study of different waste management practices and hence an attempt can be made to compare them to the situation at the Dhapa dumping ground.

A major part of research will be based on secondary data published by various consultants who have studied the Dhapa Dumpsite extensively in reference to the remediation process as well as Environmental and Social Assessment of the dump site. Primary data will comprises of semi-structured interviews with different stakeholders that have a considerable stake in the project. This will help to validate whether the proposed project is a favoured project or not.

Further photographs will bring forth considerable evidence of the existing situation and the need for prevention of further environmental degradation.

As the thought of converting the dumping ground into a bird sanctuary is still at the initial stage, various other options thought of by the Kolkata Municipal Corporation is that of a Golf Course or an Energy Park. Thus an attempt of this research will also be to provide for the best solution possible that will not only be a source of revenue for the KMC but also be beneficial and a source of delight for all the residents of Kolkata.

**REMEDITION PROJECT**

While the corporation is knee deep in trying to make sure that this project falls through, another area which needs immediate attention is the remediation project of the Dhapa dumpsite. The Kolkata Municipal Corporation, along with the West Bengal Pollution Control Board had selected the consultant firm ‘COWI’ to come up with a detailed project report of the design criteria for the remediation of the closed dumpsite as well as an environmental and social assessment report with regard to the technology proposed to be used.

The technology selected by the Danish consultant firm, COWI, and approved by the WBPCB, is that of Impermeable liner, leachate collection and passive gas handling. The general idea is that approximately 265,000 m3 of waste will be compacted in thin layers, maximum being 0.5m and reshaped at the dumpsite(COWI, 2013). The waste will be partly pushed with a bulldozer, partly excavated, transported and final reloaded to a maximum slope of 1:3(COWI, 2013). A leachate collection system will be installed, from which the leachate collected during the period of construction and the initial period after the closure of the dumpsite will be transported and treated by the KMC’s existing sewage treatment plant. A gas collection system will also be installed where gas drainage pipes will be located at 10-20 different locations and connected to a vertical pipe which will then release the gas into the atmosphere. Finally a top cover layer will be constructed with an impermeable sealing liner. This layer will be again covered with 0.50 m protective layer of soil and above that a 0.45m vegetative layer with grass and other vegetation. Lined surface water drains will also be constructed to reduce surface water run offs.

**ALTERNATIVE LAND USES OF LANDFILLS**

The alternatives that the KMC has thought of for the post closure use of the land on which the Dhapa Dumping ground is located are, golf course/bird sanctuary/Energy Park. For such a decision
to be made, it is crucial to look at the regional context in which the land is located, the existing and future land uses around the area.

Keeping such factors in mind, let us now look at certain examples in India and abroad with respect to post closure use of former landfill sites.

**BLUE HERON GOLF COURSE, ATLANTA, GEORGIA**

Blue Heron Golf Course may seem like any other golf course one may have seen, how what is different about this particular golf course is that it is located on what once used to be Morgan Falls Landfill. This landfill was owned and operated by Fulton County, Georgia. It began operations in the mid-1950s as an open dump; however the site received legal recognition as a municipal solid waste landfill only in 1975 and was closed in the late 1980s-early 1990s. In 1997 the remediation process of the landfill began which resulted in an ‘engineered cap of compacted soil and vegetation cover’ (Coates & Spencer, 2004). Post-closure care program was setup for the next 6 years which included activities like ‘recycling facility, a golf driving range, an 18-hole executive golf course, a groundwater monitoring system, a methane monitoring system, and a landfill gas collection and control system’ (Coates & Spencer, 2004).

The Fulton County in partnership Eagle Golf Ventures, Inc who raised the finances for the project, received the property through a long term lease agreement. However the Fulton County retained responsibility and liability for the environmental compliances and post closure care. The County thus received lease payments as well as a certain percentage of the revenues based on the profits the golf course earns.

The former Morgan Falls Landfill thus has been a success story, thus providing alternative uses for brown fields and other environmentally challenged properties.

**MARIANHILL LANDFILL CONSERVANCY**

Marianhill Landfill is located in ‘Thekwini Municipality, about 31km outside of Durban. Landfills are often thought of as environmentally hazardous and dealing with municipal waste has been a nightmare for municipalities across the world. The Deputy Plant Manager of Marianhill Landfill, John Parkin says ‘that the Marianhill landfill challenges the idea that landfills cannot be successfully managed and operated within an urban context’ (Moodley, n.d.).

The site is separated by a 200 metres buffer zone of indigenous plants and trees, thus no unpleasant smell or visuals of garbage are found. What is special about this landfill is that it functions on a ‘Closed Loop System’, whereby landfill naturalistic engineering is combined with their daily operations and rehabilitation of the site is conducted regularly as it reaches full capacity.

The landfill comprises of a number of cells of parcels of land which are used one at a time to dispose of waste. Once one cell reaches capacity, it is closed. At the same time another cell is dug and prepared to receive the municipal waste. For the closure of the cells, a Plant Restoration Unit has been established that recycles indigenous plants and soil from different parts of the landfills. The entire operation functions in a cyclic manner. Soil is removed from operational cells and indigenous plants are nurtured in these soils. When a cell reaches capacity, plants from this nursery taken to rehabilitate the cells. Thus the closing procedure of these cells involves planting of indigenous plants that make it an attractive place of wildlife.

The conservancy also has a number of wetlands that play a major role in this landfill ecosystem that one may call it. The wetlands remove the toxic materials in the water, break the speed of stormwater erosion and thus prevent erosion. With other facilities like a leachate plant, recycling facility and generation of electricity from the landfill gas, it has made this landfill self-sufficient and self-sustaining. This kind of integrated landfill management has thus proved not only environmentally but also economically viable with the enormous boost it has given to employment as well as an effective and sustainable way to manage municipal waste.

**GUNN HIGHWAY LANDFILL**

The fifteen acres landfill located Tampa, Hillsborough County, Florida functioned as a municipal disposal site from 1958-1962 (Martin & Tedder, 2002). However, soon after the closure of the landfill, the property was divided and given to developers. The developers thus built thirteen apartment buildings and a clubhouse, and an attempt was made to keep in mind the release of methane gas from the landfill which would be generated by the decomposition of the solid waste disposed off in the landfill.

However, even though precautions were taken to prevent methane gas from damaging the building structures, methane gas concentrations were detected under the slabs of the clubhouse and some of the apartment buildings. Methane gas concentrations severely affect electrical appliances. Thus additional ventilation needed to be constructed to minimise the risk of accumulation of methane gas. Even though data has revealed that over the years the concentration of methane gas has decreased, gas monitoring is still crucial and it likely to carry on for many more years.

**MINDSPACE, MUMBAI, INDIA**

Mindspace is a commercial property with international standards, comprising of 70% of commercial space used by the IT industries and 30% comprises of residential area. It is a 125 acre land parcel

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3 For further details read ‘Converting a closed landfill into a golf course can provide an effective redevelopment alternative’, by Richard Coates, Assistant Director, and Anthony Spencer, Solid Waste Manager, Fulton County Department of Public Works, Atlanta, Georgia. Presenters, 2004 APWA Congress.

4 For details on the precautionary measures taken while construction of the apartments, read ‘Use of Old Landfills in Florida’ by W.L. Martin, R.B. Tedder, Florida Department of Environmental Protection, Tallahassee, FL USA.
at Malad in the north western suburbs of Mumbai(Sahu, 2007). The land on which Mindspace now stands, until a few years ago used to be municipal dumping ground.

In 1968, the BMC had acquired a 15 hectare plot in Malad(TNN, 2007) to be used as a municipal dumping ground for mostly the wards in the western suburbs of Mumbai, namely H/W, H/E, K/W, K/E, P/S and P/N(Sahu, 2007). An approximate of 1000 tonnes of garbage was dumped at this site for the past 30 years. On reaching full capacity, the Supreme Court in 2002, ordered the closure of the dumping ground.

The land was then given to K Raheja Group who anyway owns most of the land in the surrounding area. The Municipal Solid Waste (Handling and Management) Act, 2000, clearly states that a remediation project needs to be in place for the treatment of the disposed waste and in addition a post closure plan needs to be developed so that to ensure that human habitation can only be an option after 30 years of post-closure care has taken place and the area is proved safe for human habitation.

However, no such rules were followed during the closure of the Malad Dumping ground. Having given the plot to Ivory Properties, owned by K Raheja Group, Ivory Property planned to develop a garden on top of the garbage dump which had reached a height of 30m by the time it was closed. Further the untreated waste from this dump yard was used to fill a marshland within the dumping ground, on top of which now stands the magnificent commercial complex ‘Mindspace’.

Due to no treatment of the waste before construction of the waste and no post closure management before the construction of the buildings began, under anaerobic conditions, the solid waste has begun to decompose slowly and release gases like Hydrogen Sulfide (H2S), Methane (CH4) and Mercaptan (CH3SH). These gases have greatly resulted in property loss. The BPO centres have repeatedly complained of their server failing and have lost millions of rupees worth of equipment a year(Sahu, 2007). Even residential buildings have been affected by the toxic gases, in terms of damage to electronic appliances, human health etc.

**LAND USE PATTERN AROUND DHAPA DUMPING GROUND**

Dhapa Dumping ground is located in an unusual location, in between a rural and an urban landscape. It is located on the eastern fringes of the city of Kolkata, where the world famous East Kolkata Wetlands are located. Immediately surrounding the dumping ground is the wetlands that have been known to sustain the ‘world’s largest and oldest integrated resource recovery practice based on a combination of aquaculture, agriculture and horticulture’(East Kolkata Wetlands Management Authority, n.d.). The wetlands were designated as having ‘Wetland of International Importance’ under the Ramsar Convention in 2003.

With the Hoogly river in the west and the Kulti river in the east, the wetlands is basically a mosaic of landforms with 46% of the area under waterbodies, 39% under permanent agriculture, 5% garbage farming and 10% settlements(East Kolkata Wetlands Management Authority, n.d.). The East Kolkata Wetlands(EKW) are also termed as the Waste Recycling Region (WRR)(East Kolkata Wetlands Management Authority, n.d.)Since the process to treat settled sewage in the EKW ponds is based upon the conversion of organic matter into algal material which is the predominant food for the fish breading in this ponds. Thus these ponds act like...
‘Waste Stabilization Ponds’ (Chakrabarti, 2013). This method has proved to be a highly successful low cost method of treatment of the city’s waste with the added advantage to providing occupation to thousands working in the fish production as well as in the agricultural land.

The city has been using this piece of land has a dumping ground since the mid-1800s and it was soon realised that the fertility of the soil increased since the garbage content in those days was high in organic content and thus the soil had become ideal of farming (Suutari, 2006). Thus the term ‘Garbage farming’ was given to such a practice. However these days the composition of the garbage has drastically changed with a considerable portion being synthetic and non-biodegradable. The agricultural lands produce the city’s vegetables which also use the wastewater stored in the ponds. This land essentially belongs to the KMC, but has been given to the farmers on lease.

Apart from the agricultural lands and the ‘jheels’, the area is home to over 100 species of plants. Water hyacinth also grows in the wetlands and happens to create a buffer zone to protect the land from erosion. Coconut trees and betel nut plants are often found around the edges of the area. The variety of vegetables that the city enjoys from the agricultural fields is cauliflower, maize, eggplant, pumpkin etc. Numerous species of fish are found in the sewage fed ponds along with several species of mammals like Palm and Indian civet and the threatened Indian mud turtle (Suutari, 2006). The wetlands are also a haven for both local as well as migratory birds, for example, kingfishers, sandpipers, egrets, terns, cormorants (Suutari, 2006).

Along with the East Kolkata Wetlands and the agricultural lands located in and around the dumping ground, right opposite this landscape is that of development having taken place in terms of modern infrastructure. The main road on the east side of Kolkata running adjacent to the wetlands is the Eastern Metropolitan Bypass (E.M. Bypass) which connects the northeast to the south of Kolkata. Since the construction of the E.M. Bypass in the 1980s, development along this road has till date not ceased to take place. This 21km stretch of road is one of the most important roads of the city and is considered the economic lifeline of the city, with plans to extend it to the Falta Processing Zone at Falta.

Thus on either side of the E.M. Bypass lies huge contrasts. On one side there is the agricultural lands, the wetlands and the dumping ground, while on the other hand is ITC Sonar hotel, Silver Spring housing complex which comprises of premium flats and houses, The Bartaman Office is the leading regional Bengali newspaper which is also located here. The recent addition to the area is the construction of the J.W. Marriott Hotel. Thus along this stretch developers have been rapidly acquiring land for the development of luxury housing complexes, hotels, shopping malls etc.

However, land acquisition continues to be a very contested issue along this road with unrestrained land acquisition taking place of the western side of the E.M. Bypass with Shopping malls, luxury housing complexes being developed at an exponential rate, while the eastern side comprising of the wetlands and the KMC owned agricultural lands where land acquisition has been regulated, however their continues to be a threat from land sharks approaching farmers directly to buy land from them. Casual conversations with farmers in the area has revealed that illegal contracts between land sharks and farmers is not uncommon and it is likely to rise given the poor conditions of the farmers.

However, on the legal side of these matters, acquiring land for construction of two elevated corridors along the E.M. Bypass in Dhapa has been rejected. Around 77 farmers’ family would be required to be given compensation of which the Railway Vikash Nigam Limited (RVNL) which is the implementing agency for the East –West Metro has agreed to pay a compensation of Rs
What needs to be noted here is that the debate between the larger development for the city and the right of farmers towards their livelihood will continue, however, what seems to be the larger issue is the conservation of the East Kolkata Wetlands and the synthesis that has been formed within the three elements which are crucial to the city. They are as mentioned repeatedly in this paper, the Dumping ground serving the city in terms of disposal of waste and to a certain extent the composition of waste for the production of manure, the agricultural lands which provide the city with almost 50% of the fruits and vegetable stock, thus cutting down extensively on transportation and thus costs of these items and most importantly the East Kolkata Wetlands which act as the natural sewage treatment plant for the entire city and also the outlet to the city’s storm water.

In such a case what really can be the cost benefit analysis between land needed for a metro corridor and the land on which the entire city is dependent upon. At this stage maybe the precautionary principle (Feintuck, 2010) needs to be applied that is to say that the uncertainty of what will happen if all the wetlands were filled up is still not fully understood and hence an attempt can be made to limit the interests of a certain kind of development arising from commercial gain to a set of broader concerns of the society that needs to be addressed with regard to threats to human health or the environment.

**LAW OF THE LAND**

The term East Kolkata Wetlands was first coined by ecologist, Dr. Dhrubajyoti Ghosh in the 1980s, when he first discovered the ecological, socio and cultural importance of these wetlands to the city of Kolkata.

The city of Kolkata had initially developed into an urban centre without proper sewerage and solid waste management system. The waste was initially thrown in the Hoogly River, however due to widespread outbreak of malaria the practice was stopped and an alternative was found in the salt lakes (wetlands) since their natural elevation eastwards is 8.5 feet below the highest point in the city (Ritesh Kumar; Nitai Kundu, 2010). Hence, in 1864 a part of the salt lakes was occupied for disposal of solid waste and eventually in 1876 part of this land was converted to horticulture thus as previously mentioned the area was officially recognised as Waste Recycling Region (Ritesh Kumar; Nitai Kundu, 2010).

Although the wetlands became well known for their sewage fed fisheries and garbage farming, however the thought of reclamation of the wetlands continued to run through the minds of the city planners. Further with the sudden surge of refugees in Kolkata, it forced the urban planners to think of expanding the city eastwards into the wetlands. About 1000 hectares of the northern portion of the wetlands were reclaimed to establish Salt Lake city in the 1960s (Ritesh Kumar; Nitai Kundu, 2010).

However the following years resulted in extensive research on the wetlands and how they were the life-line of city’s sewage and storm water drainage system. Unfortunately, no area is considered valuable unless a concrete structure is built there. This was exactly what the case with the wetlands was. With the establishment of Salt Lake city and the East Kolkata Township on another 600 acres of the wetlands (Kundu, et al., 2008), the wetlands just seen as available land for real estate developers. Further the E.M. Bypass was constructed in 1980 and a designated area of the wetland was converted into the Municipal Solid Waste Disposal Ground. At present 6500 acres of the wetlands remain and are either under sewage fed aquaculture or garbage farming or paddy cultivation.

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1 The precautionary principle states that if any policy or action is suspected to be a risk and the outcome is uncertain and has the potential to cause harm to the public or the environment, due to the lack of scientific knowledge about the impact and outcome of a particular action or policy, then the principle maybe applied, until such a time that further scientific findings emerge indicating that no harm will result.
The city has been growing rapidly and due to land crunch, wetlands have been subjected to land grabbing from real estate developers. In 1992, it was proposed that 800 acres of the wetlands would be converted for different development activities.

However, ever since the study done on the wetlands in the year 1985 on the wise use of the wetlands and their economic value to the city, urban planners of the city have been slightly hesitant on their own and under pressure from environmental experts to allow for reclamation of the wetlands for urban settlements. Following a case study presented to an expert committee formed for the Ramsar Convention, the site was declared as a Wetland of International Importance (Ritesh Kumar; Nitai Kundu, 2010). Ever since then petitions have been written by several non-governmental organisations, directing state authorities to protect the wetlands and maintain their unique character, thus preventing overall reclamation of the land for residential or commercial purposes.

Thus this judgement lead finally to the notification of The East Kolkata Wetlands (Conservation and Management) Act, 2006, which as the name suggests is an institutional framework for better management of the Ramsar Site (Ritesh Kumar; Nitai Kundu, 2010).

POSSIBLE HURDLES

By now it would have been clear that after the remediation project is completed certain alternatives to the use of the dumping ground are automatically eliminated. The Municipal Solid Waste (Management and Handling) Act 2013, clearly states in Schedule I that ‘the landfill site shall be away from habitation clusters, forest areas, water bodies, national parks, wetlands…’ (Municipal Solid Waste (Management and Handling) Act, 2013). Thus the possibility of establishing a new dumping ground in the area will be a clear violation of the Act, since the land is in the vicinity of the East Kolkata Wetlands.

Another clause in the Act is that ‘post closure care of the landfill site shall be conducted for at least fifteen years and long term monitoring or care plan…’ (Municipal Solid Waste (Management and Handling) Act, 2013) should be conducted. This is a very important clause and if not taken seriously can result in the same incident that took place in the Malad Dumping ground.

The possible hurdles for the KMC would be to find the best option for the conversion of the dumping ground. What needs to be kept in mind are the farmers and fisherman surrounding the dumping ground who have thrived off the city’s waste for generations. The land use of the area has to be such that it would be beneficial to these stakeholders too.

However, what continues to be a concern is the manner in which revenue can be generated from this area. With the ‘bird sanctuary’ as a valid option, revenue can be generated in terms of entry fees, construction of visitors’ gallery.

With the wetlands already a region rich in biodiversity, lack of plant and animal species making this area their home will not be an issue. However, the existence of the bone processing unit in the vicinity will need to be shut down. Further the consultant company COWI has only done an environmental and social assessment of the closed dumpsite which has been proposed for remediation. Hence, no assessment has been done on the impacts on the active dumpsite, the composting facility, the crematorium and the bone processing unit (COWI, 2014). Important decisions will have to be taken by the KMC, with concern to the relocation of the crematorium and the bone processing unit.

CONCLUSION

Thus it can be argued that considering all the developments in the area and keeping in mind the various Acts that apply to the region around the Dhapa Dumpsite and the various stakeholders that will be impacted by the change in land use, the best option that emerges is that of a bird sanctuary.
LIMITATIONS

While trying to come to a valid conclusion, the attempt of looking at the impact that the remediation process would have had on the dumpsite was unsuccessful due to unavailable data from other sources other than the consultants themselves. Further data on other remediation processes like 'Bio-mining of old waste' (Patel, 2007) as mentioned before has not been significant to make a strong comparison on the different kinds of remediation processes and their impacts.

Further limitations to this research have been in terms of building contacts with NGOs who might hold key interest in this project. Several attempts were made, however with no response from their side. In addition, the researchers own inability of understanding the technicality of the current remediation process as well as the likely impact it might have on the dumpsite was a huge limitation.

Thus further research in this area that could be explored is to specifically look at the remediation process proposed for the Dhapa dumping ground as well as other processes across the country and the globe that have been successful in rendering the dumpsite ecologically safe.

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ISSUES OF LAND ACQUISITION IN NAGALAND

A CASE OF KOHIMA AND DIMAPUR

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ABSTRACT
This research is carried to understand the actual scenario of land acquisition problems in Nagaland. In order to cope with the fast developing world, the State need to have proper acts and laws in place to ensure easy acquisition of land for development purposes while protecting the interest of the land owners and keeping the environment aspects in sight. Nagaland, being a tribal state, has unique land holding system. In many occasions, pattern of land holding system is being portrayed as detrimental to development activities in the state. Therefore, to understand the totality of matter this research was done.

INTRODUCTION
Contrary to most of the Indian States (West Bengal, Haryana, Maharashtra, etc.) where the State is the owner of the land, in Nagaland, the land is owned by individuals, clans, villages or tribes, which ever may be the case. There was never any sort of land tenure system that existed in the past except the traditional system. Starting from the British era, most of India was exposed to strict land reforms such as Permanent Settlement, Ryotwari and Mahalwari Systems. Under such systems, the Governing authority has sole authority over utilization of the land and collection of revenue from them. Consequently, it is easy for the state to undertake any sort of development activities requiring land, through a notified legal procedure. Also, the revenue from the land is itself a major revenue for the Government especially during those days when agriculture was the main source of GDP.

In regard to Nagaland, the land tenure system is totally different compared to those cited above. In fact, the system is slightly different among tribes within the state. Instead of the Governing authority owning the land, it is the individual or clan or village, which owns the land. Due to the unique land holding system of the tribal communities living in Nagaland, acquisition of land for development purposes have been a daunting task. The transfer of land ownership is generally through inheritance where the plot of land is handed from generation to generation. Urbanisation has led to commercialization few of such lands. In the urban areas, formalized land holding systems such as land patta system is practised to some extent at Dimapur. However, the land ownership is still firmly controlled by the respective land owners and very little power can be exercised by the government authorities to acquire them. At the most the land may be leased out to an outsider. In order to cope with the fast developing world, a viable solution to land acquisition has to be achieved.

MOTIVATION
Nagaland, like most of the North-Eastern States lag in Industrial and Infrastructure developments compared to rest of the country. The little effort that Centre has taken initiative to bring about development is often met by numerous obstacles ranging from anthropogenic factors, to geo-physical setting to financial and policy bottlenecks. A vital prerequisite for development is available land. Most of the bigger projects in the State are being delayed or failed with reasons related to land. Following are major projects in Nagaland affected by land related issues:

1. Dimapur-Kohima (Zubza) Railway Project: This project was sanctioned in the financial year 2006-07 but due to exorbitant rates demanded by land owners delayed acquisition of land for laying railway line from Dimapur to Zubza, the project is still incomplete.
2. Four laning of NH 29 from Dimapur - Kohima: This project was proposed during the Prime Minister’s visit to Kohima in 2003 and allotted a package of Rs 400 crores for four laning of the road. However due to political discrepancies and high inflation of land cost, the project is being delayed till now. The “final approval” of the Cabinet Committee on Economic Affairs came just three months shy of completing of 10 years to the day the then-Prime Minister of India Atal Bihari Vajpayee announced the four-lane highway.
3. Chie Nu Airport in Kohima: The proposed airport is been delayed because of land cost disputes as well as land suitability. The Centre has requested Nagaland Government to find alternate site. Mention may be made here that the Ministry of Civil Aviation in 2006 earmarked three proposed Greenfield airports for the North East – Itanagar, Gangtok and Kohima. AAI has already taken up the construction of Pakyong airport and is expected to be completed by 2016, while AAI has completed the Master Planning of Itanagar airport and is in process of making the DPR. (Post)
4. Expansion of Dimapur Airport: Till date not successful because of failure of acquisition of necessary land around the airport.

OBJECTIVES AND SCOPE
The research will look into the factors linking land acquisition with (infrastructure) development in the State.

The research question are as follows:
1. What are the various dimensions of land acquisition problems in Nagaland?
2. Is land acquisition problem hindering the infrastructure development activities in Nagaland?
3. What is the solution to tackle the unique land holding system in acquiring land for development activities?

The aim of the study will be therefore to study the problems of Land Acquisition in Nagaland.

With a view to achieve the aim, following objectives are framed:
1. To study the pattern of land holding system in Nagaland
2. To study the accepted legal framework for land acquisition in Nagaland and identify the issues related to it.
3. To study the process of land acquisition followed by infrastructure projects in Nagaland and issues faced.
4. To study existing land acquisition problem related development activities.
RESEARCH METHODOLOGY AND FRAMEWORK

The research is descriptive in nature and will use data from both primary and secondary sources. The research will be based on conducting primary survey on PAFs, stakeholders such as government bodies, tribal bodies, land owners, PLAs etc. Secondary data will be from project reports containing land acquisition method and processes followed. The research will also take into consideration of the existing land acquisition tools existing in the Country vis-à-vis Nagaland State.

For primary survey, questionnaire is prepared to collect information. With the help of this, key persons involved in the development projects are interviewed. The samples are from Government officials, community leaders and public leaders, emphasizing on those involved in the particular project in examination. Since the community bodies are strong and the final decision taken by those are abiding to one and all, less importance is given to the individual level such as land owners. The administrative set up and mechanism existing in the state will also be studied though personal interview with authorities as well as documents available from the gazette.

Study Framework of this research is shown below:

DESCRIPTION OF THE RESEARCH WORK

Nagaland is protected by the Article 371A, which reserves the right to the Government of Nagaland to enact laws and acts, regarding ownership and transfer of land and its resources. Any Act passed by the Central Government, come in affect in the State only if/unless, the Legislative Assembly of Nagaland by a resolution so decides. In 1965, Nagaland introduced the Nagaland Land (Requisition and Acquisition) Act 1965 which was based on the colonial LAA 1894. In 2013, the LARR was passed however Nagaland Government is yet to adopt the Act under her ambit. The new LARR not only provide compensation for land owners but includes the livelihood losers being entitled for compensation.

The current study will give a better insight into land management in Nagaland, how land is acquired for different development projects and the prevailing loopholes in the land acquisition mechanisms. The common perception is that land acquisition problem is hindering development activities in the State. This perceived notion is supported the fact Nagaland is protected by special provisions in the constitution, as in Article 371(A). However, there is need for thorough understanding to the issue before arriving at any sort of conclusions. If at all there is any such land related factors hindering the development activities in the State, this research will yield better understanding on those facts, or if any other factor is at play resulting in slow development. Towards the conclusion of this research, through analysis of primary and secondary data collected, suitable recommendations will be proposed to help tackle the issues which can ideally help smooth implementing of projects in future.

LIMITATIONS

Due to stipulated time and complex nature of the subject matter, the research is confined to studying the development projects involving land acquisition around Kohima and Dimapur. The case studies chosen will also be primarily based around these two urban centres. (Kohima and Dimapur are the two single largest urban centres in Nagaland). There is very limited secondary data available for the topic hence in many cases abstract data could be used.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Methodology</th>
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<td>On-going projects in Nagaland, status of completion, nature of issue for delay, reason, etc.</td>
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<td>Understand specific issues, ways of possible intervention</td>
<td>Primary and secondary data analysis</td>
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FINDINGS FROM PRIMARY SURVEY

BRIEF ACCOUNT OF KOHIMA MUNICIPAL COUNCIL (KMC)

Presently the KMC is not dealing any land related issues. All land related matters are looked after by the District Administration. Although the Nagaland Building Bye Laws is already passed in the Nagaland Legislative Assembly since 2013, the council is yet receive any official authorization from the District Administration to implement it. The functions of the office are mainly collection of garbage, issuing trade license, registration of birth certificates, and in some rare cases, intervene in extreme development activities which are likely to cause nuisance to the public. Apart from these, KMC doesn’t even poses details of Government land in Kohima nor details of land acquired in and around Kohima. Due to lack of authorization, KMC cannot enforce any legal notice on issues related to land, be it on encroachment of Government land or legal or illegal construction activities happening within its jurisdiction. A ray of hope is the fact that Nagaland Government is trying to implement the 74th CAA. This will significantly increase the function of KMC as well as enhance the work force.

Few of the issues faced by the KMC are as follows:
- Need for full transfer of functions and power to the KMC
- Need for technical professionals inorder to meet the 18 functions in the 74th CAA
- Authority to take control over land issues within its jurisdiction instead of having to turn on to District Administration to execute restrictions on unwanted developments.

The office has recommended slow devolution of functions to KMC in phase manner since the office will not be able to handle all 18 functions at a go.

OWNERSHIP OF LAND

Nagaland follows traditional customary land holding system where the land belongs to the individual or a clan or village or at the most the whole community, whichever may be the case. Every land parcel in the state belong to certain owner and utilizing the plot solely depends on the discretion of the concerned individual.

Nagaland is comprised of officially recognised 16 Tribal groups. Each of these tribe follows ancestral land holding system and there is slight variation in the pattern of ownership and transfer of land. In some tribe, the clan chief owns the entire land, whereas in others, individual ownership exist.

Among the Naga tribes, wealth was traditionally measured by agrarian land, amount of paddy and livestock. Hence, a great deal of relevance is laid on land possession and its direct relation with the well-being and status of a particular household. As per the primary survey, the following type of lands are found in the State.

a). Ancestral land or Clan land

Ancestral or clan land belongs to a particular clan, the possession of which has been passed down from generation to generation. It can only be disposed with the concurrence of all clan members which is usually very rare. This type of land can be inherited only by clan members. Such land is usually utilized by the clan members and even though some members wish to pass it on, if some members choose to continue cultivating or utilize for other purposes, the land is hold back and thus usually such lands are rarely disposed.

b). Inherited land

Inherited land, not amounting to ancestral land, is the land inherited by children from the personal capacity of their parents. In the disposal of inherited land, the family members and the Village Council need to be consulted.

c). Individual land

Individual land is acquired by way of purchase and can be disposed at the discretion of the individual with the permission of the Village Council.

d). Village Land/ Forests

Village land refers to the forests and grazing pastures owned collectively by the village as a whole. The village land cannot be disposed without the consent of the Village Chief and Village Council.

e). Land acquired by virtue of discovering it

This type of land, as the name suggests, resulted from a tradition followed during earlier times when vast tracts of unchartered territory were acquired by individuals who set eyes upon them first. Also, in the days of internecine warfare between villages, the territory over run by the victorious village came into the possession of the individuals who first staked claim over it.

In the sale of any land property within the jurisdiction of the village, the first preference is given to the relatives of the family who owns it, next it is open to any individual belonging to the village. If there are no buyers from within the village, the land can be sold to individuals from other villages. However, under no circumstances, can any land in the village be sold to a non-Naga.

GOVERNMENT LAND

In the beginning when the Administrative Headquarters and Block Headquarters were set up in various parts of the State, the public were very enthusiastic to have these establishments in their respective areas and for that there were competitions among the tribes, areas and ranges offering lands and other such facilities free of cost. Many of the Administrative Centres and Block Headquarters were established on lands donated free of cost donated by the individuals or parties after executing agreements between the parties concerned.

ISSUES ON GOVERNMENT LANDS

People are now claiming compensation for the lands which were freely donated to the Government at free will. The lands allotted to each individual departments initially were misused and allotted to private individual by government officials. (GON, Office Memorandum).

Through interview with the Revenue Officer, Kohima District Administration, it came to light that at Kohima, the Government lands are being encroached almost completely that now there is no vacant government land available for development activities.
Initially, bulk of lands were donated by the Kohima Village, to the Government of Nagaland, in lieu of setting up Government offices, Schools, hospitals and other necessary amenities such as roads, essential for an administrative headquarter.

**REVENUE LANDS IN NAGALAND**

Although all Administrative Centres and Headquarters are supposed to fall under Government revenue land, only Dimapur Town is able to collect yearly revenue from the patta holders. Within Dimapur town, there are a total of 11 blocks and 19 revenue villages surrounding the Town. Each of the 11 blocks are further grouped under 3 Mauzas.

**TRANSFER OF LAND**

As per the directive of the Finance Department, Government, “the allotment of Government Land in Dimapur and other parts of Nagaland is strictly to be followed as no land will be allotted to persons other than indigenous inhabitants of Nagaland except in exceptional circumstances and with the specific approval of the cabinet. In regard to persons who are indigenous inhabitants of Nagaland, Government land can be allotted only if such allotment would serve bonafide public purpose. Even in such cases i.e. in the case of Nagas, settlement of land in Dimapur either permanent or temporarily shall not be made without specific Government orders i.e. without the prior approval of the Minister in charge of Finance & Revenue. In either case i.e. where an allotment is to be made to non-Nagas or to a Naga no allotment of land shall be made without obtaining in advance full payment of the amount of premium as may be prescribed from time to time”- (GON, Compilation of Acts, Rules, Notifications, Memoranda and other instruments of Government for Land Revenue Administration)

“In regard to land outside Dimapur Mauza, allotment or sale of land to persons other than indigenous inhabitants of the State is not permissible. In regard to allotment of Government land to indigenous inhabitants of Nagaland, the primary consideration shall be whether any public purpose is served by making an allotment of Government land to private individuals. Even in cases where the allotment of public land to a private person is justified on public policy, no allotment should be made without reporting the case to the Government and obtaining Government orders.”- (GON, Compilation of Acts, Rules, Notifications, Memoranda and other instruments of Government for Land Revenue Administration)

The District Administration i.e. DC/ADC of an independent Sub-Division is the sole authority for allotment of land and no Government Department/Offices are allowed to allot land to any private individuals/societies/communities or any other Government Department.

Dimapur area is the only cadastral zone in Nagaland where non-indigenous people can buy and own lands. In Meghalaya, although the non-indigenous population is double, they are not allowed to buy and own lands. (Reporter)

**SPECIAL SCENARIO FOR NAGALAND**

1. Article 371(A): ownership and transfer of land and its resources are solely decided by the Nagaland Legislative Assembly.
2. Nagaland Village Council Act, 1978: Under this Act, the village councils have full power to deal with internal administration of the village. Also there can be no transfer of immovable without the consent of the Village Council.

**EXISTING LAND ACQUISITION TOOLS/INSTRUMENTS**

Government of Nagaland has amended few Acts and Laws to help ease acquiring land for development purposes beneficial to the public.

1. Nagaland Land (Requisition and Acquisition) Act 1965: This Act was laid for requisition and speedy acquisition of land for public purposes and extends to the State of Nagaland. The contents of the Act are excerpts from the Land Acquisition Act 1894. This Act was further elaborated in the Nagaland Land Requisition and Acquisition Rules, 1968. Through the directives of the Land Revenue Department, Government of Nagaland, any Department acquiring land for any Govt. Projects/undertakings enterprises are required to set up Rehabilitation cell to tackle and look after the displaced persons.

2. The Nagaland Land and Revenue Regulations Act 2002: This Act was amended to the Assam Land and Revenue Regulation 1886. This Act strengthen the clarity of non-transferability of land to people other than the indigenous inhabitants of Nagaland. Further amendments opened up for leasing land to commercial banks, cooperative societies or other financial institutions, provided that they do not transfer land to a person other than the indigenous inhabitants of Nagaland. In many cases, these instruments are not followed because of the complex nature of situation in Nagaland. The community is the stronger organisation when it comes to decision making for the people in Nagaland.

**GOVERNMENT BODY FOR LOOKING AFTER LAND ACQUISITION MATTERS**

Government of Nagaland has constituted a dedicated body to look after land acquisition matters in the state called the State Land Acquisition Authority (SLAA). The SLAA is composed of 17 members, headed by the Chief Minister, while other members includes Chief Secretary and representatives from various state government departments from the state. The Secretarial tasks for the SLAA is performed by the State Planning and Co-ordination Department.

**The roles and responsibilities of the SLAA are as follows:**

i. Examine all proposals for land acquisition including compensation for buildings standing in the land to be acquired for the purpose of developmental projects or for public amenities or works of public benefit.

ii. To decide on the area of land required to be acquired and allotted to various departments and agencies for developmental and public utilities.
iii. To approve land compensation rates for various categories of land proposed to be acquired.
iv. To determine additional areas of land to be acquired for use for future development projects.
v. To review the utilization or otherwise of land acquired and allotted to various departments and agencies which have remained unutilized for more than 3 years and decide on their cancellation or extension if found warranted.
vi. To direct enforcement of building bye-laws and directions for construction of government directorates and offices/establishments particularly in the new Capital Complex Areas.
vii. To direct and effect eviction of encroachers of Government land within the State.
viii. To direct preparation of Master Plans for District Headquarters. Administrative Headquarters and strict adherence to the Master Plans proposed by all concerned.

The jurisdiction of the SLAA also extends to the whole state and also cover land and buildings required to be acquired by the state even outside the State.

**PROCESS OF LAND ACQUISITION THROUGH SLAA**

Any government department or Agency requiring land for development give proposal to the Department of Land Records and Survey(DLRS). It is the task of this Department to do initial primary survey and get the details such as plot size and exact location, mapping, etc. The details are sent to the District Administration(DA) for vetting and crucial decisions such as compensation money, other terms of agreement conditions, etc. are finalized and sent back to the DLRS. The proposal is then sent to the state Planning Department and after processing the secretarial works, forwarded to the SLAA for final decision on all matters related to the projects, as discussed at the District Administration level. After the final decision is made, the final proposal is sanctioned and given to the District Administration for further action. The DA is responsible for maintaining records of the amount of land acquired, disbursement of land compensation money and fulfilling other conditions in the project agreement. The land is usually leased out to the concerned department/authority at a nominal annuity. At present the rent is Rs 200 per Acre per year.

**ESTIMATION OF LAND VALUE**

Land prices are generally a combined valuation of the land value and the assets in the plot such as building, trees, ponds, etc. There are also external factors which influence the land value such as location, terrain, connectivity, land stability, etc. and also including anthropogenic factors such as political influence, individual preference, community decisions, etc. However, there is no concrete method or benchmark for estimating land values in the state.

**STAKEHOLDER MAPPING OF GOVERNMENT DEPARTMENTS INVOLVED IN LAND ACQUISITION**

Various Government Departments involved in the Land Acquisition process are shown below:

**BRIEF ACCOUNTS ON LAND ACQUISITION OF VARIOUS PROJECTS IN NAGALAND**

1. Four-laning NH29 between Dimapur-Kohima stretch: The project is under the Special Accelerated Road Development Programme (SARDP-NE) of the North Eastern Region, and was announced by the National Highways Authority of India (NHAI) in December 2003. The preliminary survey
was done by a private consultancy with the help of PWD of Nagaland. As per report from The Morung Express, the land owners were caught by surprise when the alignment survey party enter the private lands to install pillars. The incident was termed due to some communication gap, by the District Administration.

The project run across two district administration zone therefore each DA looks after land acquisition matter within its own district. In both the cases, the DA consult the Village Council directly for land acquisition. The VC takes the responsibility to negotiate with land owners within their jurisdiction. There were also issues of people losing the only plot they own and the Government could not avail the R&R facility since there is no Government land. Also it is quite infeasible to reallocate any tribal family since there is strong attachment with the ancestral residential plot or even cultivated lands.

Land rates were fixed by the DA as follows:

- **a. Commercial**: Rs. 40 per Sq. Ft.
- **b. Residential**: Rs. 35 per Sq. Ft.
- **c. Terrace Field(Developed Area)**: Rs. 35 per Sq. Ft.
- **d. Plantation(Developed Area)**: Rs. 30 per Sq. Ft.
- **e. Jhum Land**: Rs. 25 per Sq. Ft.
- **f. Quarry Land**: Rs. 50 per Sq. Ft.
- **g. All Structures other than Residential**: Rs. 35 per Sq. Ft.

Presently there is need for reassessment of the project cost due to delay in implementation. Also the PLA is yet to be finalized.

2. **Railway line from Dimapur to Zubza**: As per information from the Directorate of Land Records and Survey Nagaland, Dimapur, the land compensation amount is agreed between NFR and land owners. The railway line is supposed to cross a Zoological garden, which the ministry of environment failed to clear the permission. Therefore there is need for taking new alignment. The department is bearing the expenses in assisting the NFR carry out the preliminary alignment survey. This is an extra burden for the department since the project is clearly awarded to the NFR.

3. **Government Medical College, Kohima**: The most recent proposal for development is the Medical College proposed at Kohima. A total of 135 acres of land was acquired by the District Administration through Kohima Village Council(KVC). KVC directly dealt with the government authority without the involvement of every individual land owner in meetings. This reduced the complications that may be brought about while dealing with numerous land owners. The land owners were dealt separately by the Village Council and collective decisions taken which were forwarded to the Government Officials by the KVC itself. Compensation received are as follows:

- **Rate per Acre**: Rs. 12 Lakhs (Market Value is estimated at Rs.
1 crore
- 2 MBBS seats every academic year, 1 for the KVC and 1 for land owners
- 6 Grade III posts (LDA), one time
- 50% Grade IV reserved for land owners
The location as well as charter of demand was decided by the KVC.

4. **KMC Dumping Site:** The site is located in southern boundary of Kohima Village. A total area of 92 acres was acquired at the rate of Rs. 4 lakhs per acre. This site is landslide area and far flung. In this too, KVC identified site and negotiated with the government officials.

5. **St. Joseph College, Kidima:** The required land is directly transferred to the College Authority through negotiation with the Village Council. Similar process was followed in the land acquisition for setting up the Global Open University at 7th Mile, Dimapur where the college authorities negotiated with the Village Councils directly.

6. **Proposed Nagaland Special Development Zone (NSDZ):** This bill was passed in the Nagaland Legislative Assembly in 2013 in view of promoting industrial and economic development along the foothills of the State. However due to fear of infringement of rights of the land owners, which is protected by the Article 371(A), on the utilization of land and its resources, the big project is being protested by concerned community organizations in the area.

### ISSUES OF LAND ACQUISITION IN NAGALAND

1. **Limited cadastral area:** Majority of the areas in Nagaland are not under the cadastral map. There are no official record of land owners in the State. Even though the government has already directed to bring the entire state under cadastral mapping in 2006, there is still no outcome. The Department of Land Records and Survey is the nodal body in Nagaland to carry out the envisaged task of mapping Nagaland.

2. **Fragmented land holding system:** Since the land is passed from generation to generation, the lands are divided further more each passing generation. As a result, there is a large number of owners over a small plot of land. In the Naga society, almost every one owns ancestral land at their native villages.

3. **Lack of effective ‘land laws’ in the State:** The State Government has passed the Nagaland Land Act in 1965, which is an excerpt from the Land Acquisition Act 1894. However, the Act itself is too rigid and incompatible with Nagaland state since the Act was framed on the British era context trying to acquire bulk land with little consideration of any other aspects such as social, physical, environmental, economic, etc.

4. **Loopholes in Administering Government lands:** During the creation of Administrative Headquarters and Sub-Divisional Centres, vacant land was donated by villages and communities, free of cost. However, with time and rising value of land, few vested interested government officials as well as land owners started extracting the vacant Government lands. This resulted in improper allotment of such lands to private individuals. Some land owners also resold their lands at their own discretion.

The State Departments failed to protect the lands allotted for development, which resulted in misuse and loss of Government Lands.

5. **Article 371(A):** The Article has given extensive rights to

<table>
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<th>Sl. No.</th>
<th>Name of Project</th>
<th>Amount of Land Acquired</th>
<th>Cost/Rate (INR Per Acre)</th>
<th>Method of Acquisition</th>
<th>Type of Issues</th>
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<tr>
<td>1</td>
<td>Four Laning NH-29 (Dimapur - Kohima Stretch)</td>
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<td>Through SLAA</td>
<td>Monetary</td>
<td>Apparent communication gap among the Project implementing stakeholders</td>
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<td>2</td>
<td>Railway Line from Dimapur to Zubza</td>
<td>-</td>
<td>Through SLAA</td>
<td>Monetary</td>
<td>Environmental Issues delaying Project</td>
</tr>
<tr>
<td>3</td>
<td>Government Medical College Kohima</td>
<td>135 Acres</td>
<td>12 Lakhs</td>
<td>Through SLAA</td>
<td>Monetary, Employment, Medical Seats, Less Compensation Money</td>
</tr>
<tr>
<td>4</td>
<td>KMC Dumping Site</td>
<td>92 Acres</td>
<td>4 Lakhs</td>
<td>Through SLAA</td>
<td>Monetary, Site Allocation</td>
</tr>
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<td>5</td>
<td>Chiethu Airport, Kohima</td>
<td></td>
<td>Through SLAA</td>
<td>Monetary</td>
<td>Need for Alternative Site</td>
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<tr>
<td>6</td>
<td>St. Joseph College, Kidima Village</td>
<td></td>
<td>Direct Consultation with Village Council</td>
<td>Monetary, Employment, Medical Seats, Mental Health</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Global Open University, Sovima Village</td>
<td></td>
<td>Direct Consultation with Village Council</td>
<td>Monetary, Employment</td>
<td></td>
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Nagas with issues pertaining to Land and its resources. It has created a strong base for any sort of demand when it comes to the land related matters. The outcome is a very complicated situation when negotiating for land acquisition since the demands of the land owners may have to be given immense importance before arriving at an agreeable point.

6. Lack of mutual understanding and co-ordination among various stakeholders, excluding land owners: The State Departments are still functioning in isolation and whenever any project is to be implemented involving multiple Departments, the process has caused severe delay and even confuse the land owners in some occasion. The functions of the Departments are not properly designated and doesn’t work in favour of smooth implementation of projects or carrying out developmental activities.

7. Presence of strong Village Council in every Naga Village not feasible: Whereas in some bigger villages it could be possible that the Village Council is able to shoulder the burden of negotiating with Government Officials/PIA as well as negotiate with land owners, in many smaller villages, the VC may not be competent enough to protect and tackle the interests of the land owners falling under its jurisdiction.

8. Contemptuous move by PIA’s and Government Authorities: In certain cases, initial phases of the project disregarded consultation with land owners resulting in confusion and resentment against the development projects from the local communities. This caused the land owners and community organisations to vocal out their stronghold which is the Article 371(A). This pose a threat of blowing up the land acquisition issue to an entirely new dimension and possibly making the locals very hostile on the subject matter.

9. Exorbitant land prices demanded by Land Owners: This issue is eminent especially when there is hardly any formalized land value in the State. The situation is even more complicated in the Villages since very rarely, there are cases of commercial transaction of land in the village jurisdictions. The land owners put up any random demands way beyond the budget allocation for land acquisition of the project.

10. Vulnerability of land owners: Firstly, the land owners are on the receiving end in many cases since they are being pressured to welcome development activities for the welfare of the mass. In many cases, the compensation money received is far below the market value: not to mention the land freely donated by Village Councils(VC) during early statehood to attract setting up of administrative centres and sub-division centres. Secondly, in some exceptional cases where the land owner need to protect their land, they have no means to take up the case, since the authority acquiring their land is already the VC acting with the mandate of the District Administration.

11. Lack of Resettlement and Rehabilitation Act: The State doesn’t have a proper R&R policy in place for the project affected families. The Government of Nagaland has given directives for each State Department acquiring land to set up rehabilitation cell but there is need for more comprehensive policy to tackle the displacement issues in a project. Another burden is that there is no Government Land to reallocate the project affected families.

12. No laws to tackle environment aspect: Nagaland is a hilly State and therefore the ecosystem is fragile. The environment is sensitive due to diverse flora and fauna content as well as hilly topography. Landslides are common which occur both naturally as well as due to human disturbance. Any development activities involving land development have severe impact on the environment if not take care of. The issues range from destruction of flora, loss of habitat for animals, dumping of soil on surrounding areas, landslides, deforestation, pollution, etc.

**RECOMMENDATIONS FOR LAND ACQUISITION IN NAGALAND**

1. The first and foremost requirement for the State will be to cover the entire Nagaland State under the cadastral mapping. This task is already underway and especially in Dimapur district, the progress is exceptional. However, most part of the state are yet to be covered in the cadastral map of Nagaland. Even the administrative headquarters and sub-divisional centres are not properly mapped. This will help regulate land tenure system in the State and for facilitating land ownership system.

2. There is need to add amendment in the existing Article 371(A), which allows certain liberty, to Government Bodies, in accessing the private lands for public purpose developments. Nagaland also need a land law which is suited to the nature of prevailing land holding system and customary of the Nagas.

3. Need for resettlement and rehabilitation acts to protect the project affected families.

4. Land rates need to be regularised for the whole state.

5. Streamlining the functions of various Departments in the State.

6. Recognising the Village Councils as legitimate body to coordinate with the District Administration in land acquisition instead of having to deal each land owner individually.

7. The Department of Land Records and Survey should be given more recognition since all matters in the state related to land are dealt primarily by it.

8. Early devolution of functions to the Municipal bodies especially in Kohima and Dimapur.

9. Distribute the land related authority to respective departments from the totalitarian control of DC.

10. Incorporate Environment Protection and Conservation laws into the Land Acquisition mechanism.

11. Adoption of Resettlement and Rehabilitation policy for the state.

CONCLUSION

Land acquisition has been a major hindrance to large scale infrastructure development all over the country. It is never an easy task in acquiring land for any development work, be it private individuals or government bodies. While Land Laws has been more successful in few Indian States, even such legislated laws never made things simpler in most of the States. Considering this fact, the research has shown that the process of land acquisition do have few areas where issues arise, however not uncommon to other states. The issue seem to be blown up since the land owners hold on to the tag of Article 371(A) which is a unique case related to only Nagaland. However, everywhere else, the rights of the land owners are tied to each individual who owns the plot and land can be acquired from them only after certain minimum benefit is given to the land owners through legal procedures.

For instance, acts such as the recently passed Land Acquisition, Resettlement and Rehabilitation Act(LARR 2013), are comprehensively devised so that all stakeholders are satisfied. The act gives special protection to the rights of land owners and all individuals depending on the land for livelihood. This Act also attempt to ensure fair compensation and ensures resettlement and rehabilitation to the displaced family members. The situation in Nagaland seem to sail against the favour of land owners since there is no proper resettlement and rehabilitation laws in place. The absence of such rules can only worsen when the community decision is given utmost importance and individual owners are expected to oblige on to the decision. Their only fight is to take up the Article 371(A) and protest against any such developments. Lack of proper education and outside knowledge can severely affect the decision making process, especially the village council bodies.

Undoubtedly land acquisition is an issue every time any development work is to be implemented. However, there are many other lacunas where Nagaland is lagging. For instance lack of proper R&R policy, environment protection and conservation provisions, streamlined functioning among the stakeholder departments involved in land acquisition, misuse of Government Lands, etc. It is evident from these facts that numerous factors are actually hindering infrastructural development in the state and would be unfair to blame entirely on land acquisition nor Article371(A). The state government functioning needs overhauling inorder to attract infrastructure and public utility developments in the State.

REFERENCES


Reporter, Staff. “Government yet to reassess NSDZ proposal.” Nagaland Post, 6 June 2014.

Questionnaire I: For Government Officials/ Local Authorities/ Project Implementing Companies etc.
1. Details of Individual/Body/Organisation/Company
2. Type/Nature of development activity
3. Reason for land acquisition
4. Amount of land acquired/to be acquired
5. Process of land acquisition(Tools/Administrative Set up Etc.)
6. Issues faced
7. Suggestions and Recommendations

Questionnaire II: For Land Owners
1. Detail of Land Owners: Group/Individual/
   Plot Size:
   Registered Land Patta: Yes/No
   Existing land use:
   Estimated value:
2. Condition/process of land acquisition
3. Nature of compensation received/negotiated. Whether accepted or in dispute?
4. Satisfactory level of negotiation/agreement
5. Issues regarding land acquisition
6. Suggestions and recommendations
URBAN INFRASTRUCTURE AND SERVICES

TO UNDERSTAND THE PROVISION OF SERVICES BY PUBLIC SECTOR IN THE CITY FOCUSING ON DISTRIBUTIONAL ANALYSIS OF EXPENDITURE

SUBMITTED BY:
Rinky Wadhwa
SOUTH ASIAN UNIVERSITY, NEW DELHI
ABSTRACT
The aim to carry out this research is to understand how public services are distributed to the citizens of a country by looking at the expenditure done by various entities under the government which are responsible for provision of these services to the citizens. And also to analyze their trend of expenditure in past years and on that basis, policy makers can take certain required steps to ensure better provision of these public services to the citizens so as to improve their welfare and of the economy as a whole.

INTRODUCTION
Recent decades have witnessed a change in global scenario towards Urbanization. Urbanization, defined as “a process which reveals itself through temporal, spatial and sectoral changes in the demographic, social, economic, technological and environmental aspects of life in a given society. Urbanization is a progressive concentration of population in urban unit (Kingsley Davis-1965). These changes manifest themselves in the increasing concentration of population in human settlements, larger than villages, in the increasing involvement of the people in the secondary and tertiary production functions, and in the progressive adoption of certain social traits which are typical of traditional rural societies”. (Princeton (edu) paper 2009- Urbanization in India: Dynamics and Consequences).

India is also a part of this ongoing global process of Urbanization. Urbanization is an index of transformation from traditional rural economies to modern industrial one. India has witnessed a structural transformation with people moving from rural sector to urban sector, showing reduced dependence of the population on the agriculture in terms of employment generation and more dependence of the population on the drivers of economic growth, i.e, industrial and service sector, which have played a major role in the absorption of the population by providing major employment opportunities. Hence, urbanization is an inevitable outcome of the faster growth of industrial and service sector, which are the engines of economic growth of the nation. With the development trajectory moving towards the towns and cities in the recent decades, it is believed that the urban sector will play a vital role in the economic development of the economy.

India’s urban population is suggested to be close to 600 million by 2031, more than double in 2001. Also the number of metropolitan cities with population of 1 million and above has increased from 35 in 2001 to 50 in 2011 and is expected to increase further to 87 by 2031. Also the contribution of the migrated people in the increase in the urban population is a small proportion, i.e, only 22.6%, indicating the fact that the increase in urban population is mainly a natural increase.1

PROVISION OF PUBLIC SERVICES- TO MEET THE OBJECTIVE OF INCLUSIVE GROWTH
The Indian economy has moved on a high growth path since the mid 1980s. With the liberalization policy of 1990s, initiated to align the Indian economy with the World economy, it was able to put the economy not only on the higher growth path but also sustained this growth till the 2000s. During the last few decades, India has been the second fastest growing economy in the world.

Despite the high growth rate over the past two decades, concerns have been raised over the growth not being equally distributed. The benefits of this high growth has not been equitably shared by all the sections of the society. With this concern in mind, policy makers came up with the policy of inclusiveness in the 11th Five Year Plan in 2007. Inclusive growth is a concept which advances equitable opportunities for economic participants during the process of economic growth with benefits incurred by every section of society. Growth is inclusive when it creates economic opportunities along with ensuring equal access to them.

The importance of inclusive growth is carried further in the ongoing 12th Five Year Plan (2012-2017), with “fast, sustainable and inclusive growth” as the mantra of 12th Five Year Plan. Hence, one of the major challenges faced by the policymakers is to ensure “Inclusive growth” which is the principal goal of 12th five year plan, so that the gains from increased national income are shared by all the sections of the society. To fulfill the goal of inclusive growth, provision of public services like drinking water, sewerage, transport, power, sanitation, health, education, solid waste management, street lights etc. to all the citizens plays a major role, since they are not the end in themselves, but also play a very critical role in enhancing the capabilities of the individuals to participate in the growth process of the economy.

PROVISION OF PUBLIC SERVICES IN DELHI
Delhi, the National Capital Territory of India, with the current population of 17.8 million is a metropolitan region in India. It has an area of 1,483 km2 and shares border with the states of Uttar Pradesh and Haryana.3 Delhi has been one of the fastest growing cities in the country with a decadal growth of 47% from 1991-2001. The major issues faced by this city growing at such a rapid pace includes shortage of basic infrastructure (housing, water, sanitation, transport, electricity etc.) which results into major environmental problems for city dwellers and poor living conditions for the slum dwellers, the other issue being the economic development of the city which is an engine of growth of the country and the problem of people’s participation in the decisions that directly affects them.

Over the last few decades, Delhi has been adversely affected

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1 NIUA Report on Indian Urban Infrastructure and Services, March 2011
2 indiaonlinepages.com
3 Department of Urban Development, GOD
4 Economic survey of Delhi 2003-04
by high rates of urbanization which is a result of high natural population growth and migration from rural areas, and industrialization which has resulted in high level of pollution. This has resulted in heavy burden on public services, with much increase in demand not met by an adequate increase in its supply.

Hence, an adequate provision of public services to meet the growing demand is one of the major challenge faced by the Government of Delhi. The urban local bodies associated with the Delhi government to provide these services to the citizens of Delhi are:
1. Municipal Corporation of Delhi (MCD)
2. Delhi Jal Board (MCD)
3. Delhi Urban Shelter Improvement Board (DUSIB)
4. Delhi State Industrial and Infrastructure Development Corporation (DIIISC)
5. Public Works Department (PWD)
6. Delhi Vidyut Board (DVB)
7. Delhi Development Authority (DDA)
8. North Delhi Municipal Council
9. Delhi Cantonment Board

**MOTIVATION**

One of the main areas of concern in today’s world is the provision of public services in urban areas. As a student of Masters in Development Economics, I wish to pursue my research in the mentioned field and National Institute of Urban Affairs has given me this opportunity by allowing me to intern under the Peer Experience and Reflective Learning (PEARL) Programme. Under the given project, I am associated with South Delhi Municipal Corporation (SDMC), which is an entity of Municipal Corporation of Delhi (MCD) and I will be looking at the trends of expenditure in various public services that comes under its jurisdiction.

**OBJECTIVE**

Provision of public services are vital for proper functioning of an economy. They connects the citizens to the government. They are necessary for the welfare of all the citizens and are also requisite to uplift the overall economic structure of the society. Provision of public services by the government is hence, a good indicator of the how much government is responding to the needs of its citizens and how much effort it takes to raise the standards of living of its citizens. To analyze how these services are distributed, an analysis of the budget is required. Government budget acts as a mirror to assess the economic condition of the country. It gives us the picture of the financial position of the economy in terms of what the total revenues of the country are, what are the sources of the revenue, and also gives information about the expenditure side in terms of its size and the proportion of expenditure on different sectors like health, education, agriculture, industry, water and power etc., which gives us an insight on the relative importance of different sectors of the economy.

It also tells us about the situation of the economy in terms of whether its budget is balanced, surplus or deficit. It is also an indicator of the economic policies and strategies of the government in terms of whether the government is spending more on developmental purposes or on non-development purposes, whether the tax policy is encouraging the entrepreneurs or discouraging them and whether the government preferences regarding expenditure are confined to one area or to the whole economy.

To understand the distributional analysis of the expenditure on the public services by the government, as my topic suggests, we need to look at the data over the years on the expenditure side.

**METHODOLOGY**

Recent decades have witnessed a structural transformation in the Indian economy, with cities playing a major role in bringing about this change. And, provision of public services, no doubt, plays a vital role to help succeed this transformation.

Delhi, being the Capital of India, drew my attention to this topic and got my attention to carry my research in this city, to get to know the condition of provision of public services in the city.

National Institute of Urban Affairs (NIUA) gave me an opportunity to carry out my desired research by interning me under the PEARL project.

Under this, my association is with one of the major Urban local body which is responsible for provision of public services to the citizens of Delhi, i.e, Municipal Corporation of Delhi (MCD), under whose head comes my connection with South Delhi Municipal Corporation (SDMC).

My research will be based on the public services that are under the jurisdiction of MCD and the questions that my research will look into are as mentioned below.

Being associated with SDMC, I collected the required data about the expenditure front by looking at booklets of various years that contains information about expenditure made by them and compiled them in the tabular form which is given below.

The above proposed research will be based on the graphical analysis of the given data of the expenditure front of MCD, which includes bar graphs, line graphs, histograms and pie chart to get a clear picture of the desired trends.

All my analysis will be based on the Actual expenditure done by MCD over the mentioned periods from 2005-06 to 2012-13.

This research will able to present a picture about how have been the past trend of expenditure and what kind of trend we can expect in future. Will it be an upward trend or downward trend? And how can this trend impact to improve the provision of these public services to all its citizens, to improve their living conditions, and hence, its contribution in fulfilling the goal of Inclusive development.

Depending on the trend, it can further be used by policy
makers to improve their expenditure in these services in the coming years so as to uplift the lifestyle of the citizens and put economy on a higher growth path.

Comparative analysis of the 2012-13 data under the various heads will be done by using pie chart to compare the proportion of area under each of the entity of MCD, i.e, NDMC, SDMC and EDMC and the proportion of their expenditure under each of the heads.

This comparative study will analyze which portion of Delhi has been the highest beneficiary of the public services provided by MCD, according to their size.

The answer to this question can be further used to improve the distribution of the public services by all entities of MCD, so as to ensure that everyone gets equal share of it.

**DESCRIPTION OF THE RESEARCH WORK**

Expenditure occurs on every level of the government, from local city councils to federal organizations. Government spends money to supply those goods and services that the private sector fails to provide efficiently to the citizens. These public goods, provided by the government, includes defense, roads and bridges, hospitals and schools, public order and safety etc.

**Government expenditure falls basically under two categories**:

1. **Non Plan expenditure**
2. **Plan expenditure**

**NON PLAN EXPENDITURE**

The expenditure provided in the budget for normal routine activities of the government constitutes Non plan expenditure. Non plan expenditure includes expenses on heads such as interest payments on government debt, subsidies, defence, pensions and other establishment costs of the government. The estimates of non plan expenditure are decided by the Finance Ministry. Non plan expenditure constitutes the bulk of the government expenditure.

**The broad heads that come under non plan expenditure are**:

1. Interest payment and debt servicing
2. Defence
3. Subsidies, including major subsidies like petroleum subsidy, food subsidy, other subsidy etc.
4. Assistance to States from National Disaster Response Fund (NDRF)
5. General Elections
6. Postal Deficits
7. Subsidy to railways towards dividend reliefs and other concessions.
8. General services, which further includes-
   a. Tax collection
   b. Police
   c. External Affairs
   d. Pension
   e. Public works etc.
9. Social services, which includes-
   a. Education
   b. Sports and youth services
   c. Art and culture
   d. Medical, public health and family welfare
   e. Housing and urban development
   f. Information and broadcasting
   g. Labour Welfare
   h. Social security and welfare etc.
10. Economic Services, including-
    a. Agriculture and allied services
    b. Foreign trade and Export promotion
    c. Energy
    d. Industry and minerals
    e. Transport
    f. Science, technology and environment
    g. Meteorology
    h. Irrigation and flood control
    i. Census, surveys and statistics
    j. Tourism etc.
11. Non plan grants to State governments
12. Non plan grants to Union Territory governments
13. Non plan grants to Foreign governments
14. Non plan capital outlay
15. Non plan loans to State governments
16. Non plan loans to Union territory governments
17. Non plan grants and loans to Public Enterprises
18. Non plan loans to Foreign governments
19. Other non plan loans

**PLAN EXPENDITURE**

Plan expenditure includes the expenditure of government in the productive assets through Centrally sponsored schemes. It basically includes the expenditure on the items related to the Five Year Plan. In other words, plan expenditure is that public expenditure which represents current development and investment outlays that arise due to the proposals in the current plan. The estimates of the plan allocation are decided by the Planning Commission.

It basically includes expenditure on electricity generation, irrigation and rural development, construction of roads, bridges, canals and science, technology, environment etc. Also, the assistance given by the Central government for the plans of States and Union territories is also a part of plan expenditure.

**Plan expenditure basically comprises of two heads**:

1. **Revenue Expenditure**
2. **Capital Expenditure**

**Revenue Expenditure**

Revenue expenditure is the expenditure incurred for the routine, usual and normal day to day running of government departments.
and provision of various services to citizens. It includes both development and non-development expenditure of the Central and State government. These expenditure are recurring in nature and are usually for a short period of time. Usually expenditures that do not result in the creations of assets are considered revenue expenditure.

In general, revenue expenditure includes expenses in the following sectors-
1. Expenditure by the government on consumption of goods and services.
2. Expenditure on agricultural and industrial development, scientific research, education, health and social services.
3. Expenditure on defence and civil administration.
4. Grants given to State governments even if some of them may be used for creation of assets.
5. Payment of interest on loans taken in the previous year.
6. Expenditure on subsidies.

Capital Expenditure
Capital expenditure is the expenditure incurred for creating asset which have a long life. Thus, expenditure on land, machines, equipment, irrigation projects, oil exploration and expenditure by way of investment in long term physical or financial assets are Capital expenditure. Capital expenditure has a lasting impact on the economy and helps provide a more efficient and productive economy. Theses expenditure are non recurring in nature and leads to creation of physical or financial assets. Expenditure incurred on scientific research organizations, roads, bridges and buildings also come under its head.

(3) East Delhi Municipal Corporation (EDMC), which includes the districts of East Delhi and North East Delhi. My association is with South Delhi Municipal Corporation (SDMC) under the internship with National Institute of Urban Affairs (NIUA).

SOUTH DELHI MUNICIPAL CORPORATION (SDMC)
SDMC is serving the population of 56 lakh citizens with a responsibility of maintaining, upgrading and developing civic amenities efficiently.

It occupies an area of 656.91 km² which is further divided into 4 zones- Central, South, West and Najafgarh Zone and has 104 wards.

SDMC has unique distinction of providing civic services from highly posh residential and commercial areas to rural and urban villages, JJ resettlement colonies, regularized and unauthorized colonies. There are 388 approved colonies, 86 rural villages, 81 urbanized villages, 111 unauthorized colonies, 252 unauthorized regularized colonies and 32 resettlement colonies. Its headquarter is located at SP Mukharjee Civic centre, Minto Road, Delhi.7

Being associated with South Delhi Municipal Corporation, I was able to acquire all the relevant data of the expenditure done by whole of MCD for the time period 2005-06 to 2012-13 required for my research and my analysis is based on it.

OBSERVATIONS
Based on the data that provided by SDMC, the analysis is divided under the heads of expenditure mentioned above, as Non plan expenditure and Plan expenditure.

ANALYSIS OF NON PLAN EXPENDITURE
The various sectors of non plan expenditure that comes under the jurisdiction of MCD are as follows-
1. General Administration
2. Community Services
3. Education
4. Veterinary Services
5. Health
6. Engineering- Public works and street lightning
7. Land and Estate
8. Licensing
9. Horticulture
10. Exclusive development
11. Loan Repayments

Recently, Municipal Corporation of Delhi has been trifurcated into three smaller municipal corporations, which are-
(1) North Delhi Municipal Corporation (NDMC), which covers the districts of Central Delhi, North Delhi and North West Delhi.
(2) South Delhi Municipal Corporation (SDMC), which covers the districts of South Delhi, West Delhi and South West Delhi (excluding Delhi Cantt).

Wikipedia, Municipal Corporation of Delhi
mcdonline.gov.in

MUNICIPAL CORPORATION OF DELHI (MCD)
The Municipal Corporation of Delhi (MCD) was a municipal corporation, an autonomous body that governs 8 of the 9 districts of Delhi. It was one of the three municipal corporations in the National Capital Territory of Delhi, the others being New Delhi Municipal Council, and Delhi Cantonment Board.8

Jurisdiction in Delhi as against 2% of the area under New Delhi Municipal Council and 1% under Delhi Cantonment Board. Hence, MCD covers the most populated area and is responsible for providing civic services to rural and urban villages, resettlement colonies, regularized unauthorized colonies, slum/squatter settlements etc.

Recently, Municipal Corporation of Delhi has been trifurcated into three smaller municipal corporations, which are-
(1) North Delhi Municipal Corporation (NDMC), which covers the districts of Central Delhi, North Delhi and North West Delhi.
(2) South Delhi Municipal Corporation (SDMC), which covers the districts of South Delhi, West Delhi and South West Delhi (excluding Delhi Cantt).
1. General Administration
2. Social Services-
   a. Education
   b. Health
   c. Sanitation
   d. Veterinary Services
3. Recreational Activity-
   a. Horticulture
   b. Community services
4. Public works-
   a. Land and Estate
   b. Engineering- Public works and Street lightning
5. Misc. including-
   a. Licensing
   b. Loan Repayments
   c. Exclusive development

The analysis of these heads of non plan expenditure under MCD are firstly, from time period 2005-06 to 2011-12 under unified MCD and then the paper follows a comparative study of the expenditure under the various successors of MCD for the time period 2012-13.

The trend for the expenditure on Social Services done by MCD for the time period 2005-06 to 2011-12 is as shown below:

The above graph shows an upward trend in the level of expenditure from 2005-06 to 2011-12 done by MCD on Social Services which includes major social services required to uplift the society i.e, education, health, sanitation and veterinary services, with a marginal increase in 2011-12 as against in 2010-11.

The trend for expenditure on Recreational activities done by MCD for the time period 2005-06 to 2011-12 is as shown below:

The similar trend as of expenditure in social services can be observed here in case of expenditure in recreational activities as well, with a marginal increase in expenditure in 2011-12 from year 2010-11. The recreational activities includes services as horticulture and community services which makes surrounding more pleasant to live in and thus contribute to the overall development of the society.

Next, moving on to the trend of expenditure on Public Services done by MCD from 2005-06 to 2011-12 is as shown below:

Public works includes the sectors that helps in improving the infrastructure of the society and the sectors that comes under this head for MCD includes road construction, street lightning etc. The graph above suggests a fall in the expenditure in year 2006-07 as from 2005-06. The main reason for this fall in expendi-
ture was because the payments to the concerned contractors of the projects was made in 2007-08 and not in 2006-07, even though the projects started in the same year 2006-07, showing this trend of expenditure. And thereafter an upward trend of the expenditure is observed, though the major increase took place in 2008-09 and thereafter the increase was steady.

To see which of the above three mentioned heads comprised of the majority of non plan expenditure by MCD, we have the following graph-

The above graph shows that social services comprises of the majority of the non plan expenditure by MCD, followed by expenditure on public works and then by expenditure on recreational activities. This data thus suggests that the greatest part of the expenditure by MCD is done on improving the social welfare of the society by putting in their expenditure on improving the education and health facilities, which are the engine of improving the living standards of the people. And recreational activities received the least expenditure by MCD, indicating the fact that beautifying the city is not a major focus of the state government in a place which faces major other problems of lack of education, health and medical facilities. Focusing on these has been the top priority of the government, which will actually contribute in improving the overall well being of the society.

To see the rate of growth of expenditure in these three heads in the period from 2005-06 to 2011-12, we have the following graph-

Hence, the way expenditure on social services constituted the majority of the expenditure by MCD, it grew the most as well. This is very much visible in the slope of the expenditure line drawn in the above graph. And, also similarly the growth of expenditure on recreational activities grew the least, as its share was in the previous graph.

To see the annual growth rate of the Non plan expenditure in these years, we need to look at the Compounded Annual Growth Rate (CAGR), which is given in the following table, with the beginning value of the non plan expenditure in the year 2004-05.

The table above signifies that the annual growth rate of Non plan expenditure over these 7 years have shown almost an upward trend with a downward trend in 2006-07 and then in 2011-12.

Since MCD got trifurcated recently, the zonal wise distribution of the whole of MCD is as follows-
No. of zones in Delhi- 12
No. of zones under North Delhi Municipal Corporation (NDMC)- 06
No. of zones under South Delhi Municipal Corporation (SDMC)- 04
No. of zones under East Delhi Municipal Corporation (EDMC)- 02
Hence, NDMC has 50% share in the zonal distribution of Delhi, whereas SDMC and EDMC have 33.33% and 16.67% share respectively.

The most recent data on the non plan expenditure in 2012-13 is under the heads of expenditure by each entity of MCD, i.e, NDMC, SDMC and EDMC. We will look at their share under each head of expenditure.

Firstly, the graph below shows the share of expenditure of each of them in the Social services-
The above graph shows that the majority of expenditure on Social services is done by NDMC, i.e, 49% of the total expenditure on Social services, followed by 30% by SDMC and then 21% by EDMC. This is in sync with the zonal wise distribution of each of them as mentioned above.

Secondly, to understand the share of expenditure on Recreational activities, we have the figure below

The graph above shows that EDMC contributes the least among the three in expanding the recreational activities in Delhi, though it is in accordance with the percentage of zones that comes under its jurisdiction, i.e, 16%. And NDMC and SDMC have same share in the total expenditure on recreational activities, i.e, 42%, even though NDMC covers 50% of the zones of Delhi and SDMC has 33.3% of zones, showing a better performance of SDMC in comparison to that of NDMC in the field of recreational activities.

Lastly, their share in expenditure on Public works can be analyzed by the graph below-

A kind of similar trend as of expenditure in recreational activities is seen in the case of expenditure in public works, with EDMC contributing the least, which is because of its low coverage of zones of Delhi, i.e, 16%. SDMC contributes the most in enhancing the overall infrastructure of Delhi, i.e, 44%, even though it has a coverage of 33.3% of the zones of Delhi, which

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<tbody>
<tr>
<td>Non Plan Expenditure (lakhs)</td>
<td>195445.86</td>
<td>213641.3</td>
<td>224839.4</td>
<td>282207.2</td>
<td>364143.1</td>
<td>441089.3</td>
<td>553307.6</td>
<td>547779.2</td>
</tr>
<tr>
<td>Compounded Annual Growth Rate (CAGR) (%)</td>
<td>9.31</td>
<td>7.26</td>
<td>13.03</td>
<td>16.83</td>
<td>17.68</td>
<td>18.94</td>
<td>15.86</td>
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again shows its improvement in the delivery of public works in Delhi and a less contribution of NDMC, i.e., 42% in public works as against its zone coverage of 50%.

**ANALYSIS OF PLAN EXPENDITURE**

Plan expenditure, as described above has 2 sub components—Revenue expenditure and Capital expenditure and my analysis is based on these two components.

The trend of Revenue expenditure and Capital expenditure over a period of 7 years, from 2005-06 to 2011-12 is shown below.

Both the above graphs show an upward trend in both Revenue and Capital expenditure, indicating an improvement in both asset creation (through an increase in Capital expenditure) and working of the government departments (due to an increase in Revenue expenditure) in the last few years. Thus, implying that the overall Plan expenditure has increased for Delhi which is an indicator of upward trend in development in Delhi.

To look at the share of each of the Capital expenditure and Revenue expenditure in the total Plan expenditure, we have the following graph:

The graph above clearly illustrates that the Capital expenditure forms the most significant portion of the total Plan expenditure, which signifies that the building up of the new assets has been always been of greatest importance to MCD than against the Revenue expenditure which includes normal routine activities of MCD.

To see which of the two, Revenue expenditure or Capital expenditure has performed better, we can have a look at the graph below.

The above figure clearly depicts that the growth of Capital expenditure has been greater than the growth of Revenue expenditure, which is a good indicator of the growth of Delhi as it
depicts that there have been more increase in the Capital creation as against the normal routine work which is covered under Revenue expenditure.

The way data for 2012-13 in non plan expenditure was divided under the heads of NDMC, SDMC and EDMC, similarly the data for the plan expenditure for 2012-13 is under these entities of MCD.

First, we will look at the share of Revenue expenditure under them for the year 2012-13.

The pie chart above signals that SDMC has the majority of share in Revenue expenditure which is 43%, followed by NDMC having a share of 39% and then the least share of EDMC with 18%. This pattern is in similar terms of the pattern obtained in case of non plan expenditure heads, where the contribution of SDMC is slightly higher than its zonal wise distribution and that of NDMC is slightly lower than its jurisdiction.

Next, the graph below shows the share of each of the entity in the total Capital expenditure of the MCD in the year 2012-13.

The graph above is also more or less similar to the trend that we got in case of Revenue expenditure, with SDMC contributing the most among the three, in building up of the infrastructure and related services in Delhi, followed by NDMC and then by EDMC. Again the performance of SDMC has been on a higher note than that of NDMC.

To see what has been the trend of total expenditure, which is the sum of plan expenditure and non plan expenditure and the share of plan expenditure and non plan expenditure in the total expenditure, we have the graphs below-

The above graphs clearly indicates an upward trend in both plan and non plan expenditure, and hence, in total expenditure as
well. Also, the increase in non plan expenditure has been greater than the increase in plan expenditure as is visible in the slope of the line graph of each of them above. Also, share of non plan expenditure in the total expenditure is greater than the share of plan expenditure, which is in accordance with the understanding of the non plan expenditure that it constitutes the bulk of government expenditure, as mentioned earlier. This implies that even though government plans a particular portion of expenditure, but the projects that comes up in due course of time (which becomes a part of non plan expenditure) forms the main portion of expenditure by the government. Also, these types of projects lead to more increase in the government spending as against the planned spending, whose increase is very marginal as compared to the increase in the non plan spending.

**REASONS FOR THE TREND**

All the above graphs shows a positive trend of expenditure over time from 2005-06 to 2012-13 by MCD, indicating that the contribution of MCD in improving the welfare and living standard of the people of Delhi has been on a higher and a positive note over the time and can be expected to increase in future.

Looking at the trends of expenditure, both plan and non plan expenditure, the major jump in both of them was basically found in 2 major year-first, in 2009-10 and then in 2010-11. We will look at the reasons for increase in these two year separately.

The main reason for the increase in expenditure in the year 2009-10 was due to the mission initiated by the Government of India named as Jawaharlal Nehru Urban Renewal Mission (JNNURM) with an objective to improve the efficiency in urban infrastructure and service delivery in major cities to lead them to the path of development. 63 cities across India have been covered under this mission with a financial support of about 50,000 Crores. Delhi was one of the identified cities, which was eligible for JNNURM.

Municipal Corporation of Delhi (MCD) was one of the Urban Local Bodies (ULBs) which was identified by the State government and approved by the Central government to fulfill the goals.
of JNNURM.

Though this mission was initiated in 2005-06 by the Government of India, but the funds for the projects which were under MCD began to arrive in 2009-10, leading to an increase in expenditure by MCD in period 2009-10. The sectors for which MCD was given funds under the JNNURM comprised of roads and flyover construction, traffic management and car parking. 7 schemes which are under MCD are below-

1. Traffic management plan for areas around Civic centre, JLN Marg, Minto Road, New Delhi.
2. Development of multilevel underground parking at various locations under the jurisdiction of MCD.
3. Improvements and strengthening of roads of Okhla Industrial Area Phase 1 and 2, Central Zone.
4. Covering of Nallah in Nauroji Nagar from Africa Avenue to Ring road for providing parking/road cum parking under the jurisdiction of MCD.
5. Covering of Nallah from Press Enclave road passing through Sheikh Sarai, Chirag Delhi, Panchsheel Enclave, Greater Kailash 1, Andrews Ganj upto Ring road behind Police Station Defence Colony for providing Road cum parking under the jurisdiction of MCD.
6. Improvement of road of 60ft. ROW and above by providing RMC pavement (Phase 1) in various zones of MCD.
7. Remodelling of Saharanpur Samli Branch Line (SSBL) Drain. All these projects are still under progress and at present are divided under each of the entity of MCD, i.e, SDMC, NDMC and EDMC according to their jurisdiction.

Next, moving on to the period 2010-11, a lot of projects were undertaken for the Commonwealth Games 2010. Its preparation began in 2009-10 but major expenditure was executed in 2010-11. The majority of spending in this period was done on increasing the capital assets of Delhi, hence contributing to the Capital expenditure.

The schemes that were covered under MCD during Commonwealth Games were-

1. Street scraping of roads in connection with CWG.
2. Improvement of roads in various areas under the jurisdiction of MCD.
3. Covering of Sunehari Bagh/Kusakbagh Nallah.
5. Improvement of Street lightning under the jurisdiction of MCD.
6. Improvement of Urinals.
7. Road over bridge/ Road under bridge (ROB/RUB) scheme in various localities of Delhi.

LIMITATIONS

The limitations of the study are-

1. I could not cover all the public sectors under the government of India because of my connection with MCD only. There are others ULBs under the government responsible for the provision of public services to the people.
2. I was not be able to draw a comparison of the expenditure front under the different successors of MCD, i.e, NDMC, SDMC and EDMC for the periods before 2012-13 as MCD got trifurcated only recently.
3. I could not carry out a time series analysis of the expenditure as the data set is very small and Stata would not have given a good result. Time series analysis would have been possible in case quarterly data was available but records were not appropriate to get the required data for analysis.
CONCLUSION

India, is a place of hope and opportunities for many, and hence, there is an immediate need to revolutionize and rejuvenate it. With this objective in mind, the current Prime Minister Mr. Narendra Modi came up with his idea of building “100 smart cities”. According to a global growth consulting firm Frost & Sullivan, “Smart cities are an evolved state of urbanization where application of technology integrates diverse individual entities such as buildings, utilities, authorities, infrastructure and industries.” Modi’s idea of building up smart cities came up with his belief that creation of infrastructure is a solution to the India’s rapidly urbanizing population dilemma.

Delhi, the National Capital Territory of India, is also under the domain of Modi’s “100 smart cities”, with Delhi witnessing a high rate of urbanization in the recent decades.

To enhance the development process of Delhi and to improve its infrastructure and related public service delivery mechanism, so as to expand the capacity Delhi to be able to incorporate the high increase in its population, the contribution of MCD has been immense in the past few decades. This is attributable to the upward trend in its expenditure on the provision of the public services that comes under its jurisdiction.

As clearly visible in the graphs drawn earlier, both Non plan expenditure and Plan expenditure of MCD has received a boost in the last few years and thus, can be expected to increase further in future. Among these two, the growth rate of Non plan expenditure has exceeded the growth rate of Plan expenditure, which is an indicator of the fact that the new projects and ideas that evolves in the due course of time receives a paramount chunk of the total expenditure of MCD as opposed to those which are planned in the beginning.

Looking at the Non plan expenditure, social services, comprising of education, health, sanitation and veterinary services composed of the most significant proportion of the total non plan expenditure, amounting to approximately 65% of the total non plan expenditure and the rest comprising of public works, recreational activities, general administration and miscellaneous works. Also, the growth rate of the expenditure on social services remained at the top as against the growth rate of other heads of non plan expenditure. This attributes to the fact that utmost priority sector of MCD is on improving the social welfare of the society.

Among the Plan expenditure, Capital expenditure received the most crucial portion of the total plan expenditure in opposition to the share received by Revenue expenditure. Also, the growth rate of Capital expenditure has been eminent than the growth rate of Revenue expenditure. Both these facts highlights that the establishment of capital assets in Delhi has always been a matter of great importance to the State government of Delhi (of which MCD is a part).

Non plan expenditure, which forms the bulk of the total expenditure of MCD has also seen an upward trend in its growth rate as measured by its Compounded Annual Growth Rate, with a downward trend recently in 2011-12.

MCD got trifurcated recently into North Delhi Municipal Corporation (NDMC) comprising of 50% of the zonal wise distribution of Delhi, followed by South Delhi Municipal Corporation (SDMC) incorporating 33.3% of the zones and the rest 16.67% by East Delhi Municipal Corporation (EDMC).

The contribution of each of these entities of MCD to both non plan expenditure and plan expenditure is to some extent in accordance with their zonal wise distribution, but there are some cases where the contribution of SDMC was a little more than its zone coverage whereas that of NDMC was a little less than that of its respective zone coverage.

In totality, we have seen a progressive trend of the total expenditure of MCD in the past few years and the projects-JNNURM and Common Wealth Games projects contributed significantly to it.

The schemes under both these heads included activities pertaining to infrastructure, in terms of improving the condition of roads and car parking mechanisms for better management of traffic. Though these have been the recent projects of which MCD became a part, but still the normal functioning of MCD which includes projects related to social services-health and education, still forms the core expenditure of MCD.

Further research suggestions-
The above research just looks at the expenditure front of MCD but does not look at the source of funding i.e. the income of the MCD, by which these expenditures are financed. Hence, this research can be further carried forward to look at the Income side of MCD and the distribution of the same and then see how expenditure is divided amongst various sections, to see if the distribution done is feasible.
IS CHHOTA NAGPUR TENANCY ACT AN OBSTACLE IN THE DEVELOPMENT OF HOUSING SECTOR?

A STUDY BASED IN RANCHI

SUBMITTED BY:
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SYMBIOSIS INTERNATIONAL UNIVERSITY, PUNE
ABSTRACT

The present paper is going to be an analysis of what has been the most talked about act of the state and its effect on the housing sector in Ranchi district. The Chhotnagpur tenancy act was enacted in 1908 to protect the rights of tribal communities but there are questions being raised on its relevance in modern day context. This study will look into various aspects and details related to the research topic to figure out whether actually this act is an obstacle in the development of housing sector in Ranchi district.

INTRODUCTION

As we all say that the 21st Century will be an Asian century but it will also be an urban century with much of its urbanization taking place in Asian cities, especially in countries like India and China. For Asian economies like India, Pakistan, Bangladesh etc. (since most of them are developing) to maintain and to further increase the pace of growth these developing economies need to have a sound urban infrastructure not only to generate employment but also to accommodate people living in the city by providing them sustainable human shelters and by that we mean well-managed entities in which economic growth and social development are in balance with the carrying capacity of the natural systems on which they depend for their existence and result in sustainable development, wealth creation, poverty alleviation and equity.

There is a substantial decline in employment elasticity (e.g. increase in employment for every unit rise in GDP) in almost all the major productive sectors, except for transport and finance. In agriculture, the employment elasticity has dropped to near zero in India. The reason for the phenomenon of jobless growth could be that growth in India has essentially been capital intensive in the post-liberalization period the employment growth in agriculture dropped from 1.49 per cent per annum to 0.01 per cent per annum. The recent trend of over-capitalization of agriculture also affected the employment elasticity of agriculture adversely. The failure of agriculture in generating enough employment for the rural youth has led to migration and due to this unplanned growth of the cities has taken place.

Indian cities lack the desired level of infrastructure and which is one of the main reasons for the degradation of cities and that has raised questions over the sustainability of human settlements as they are growing in an unplanned manner. Urban planning has gained attention all across the world and housing is the most crucial factor in it. This is particularly severe in cities because, by 2025, more than 50% of the population is expected to reside in urban settlements in search of stability and income in India. This would lead to a shortage of 25 Million housing units – most of it being in the Economically Weaker Section and the Low Income Housing space. More poor people live in the rural areas than towns and cities, according to the World Bank India faces a housing shortage of nearly 74 million housing units by the end of 2011. In 2007, the total housing shortage in India was around 24 million units and by 2012, this figure experienced a dip by about 25% but on the other hand states like Jharkhand saw an increase of 34%, it went up from being 0.47 million to 0.63 million units in just five years. This clearly shows that the Jharkhand state government needs to work on various aspects of urban planning and couldn’t meet the needs of the people.

The state of Jharkhand was carved out of Bihar in the year 2000 and Ranchi serves as the capital city of the state and it has been an important commercial, administrative and educational centre of the region. The city is mainly based on tertiary activity. About 22% of the workforce is engaged in wholesale & retail trade, while 19% in manufacturing & repairs. Being a capital city, engagement of about 22% workforce in public administration, defence, social security and education, health, is expected. The district has 540 industrial units in and around close proximity of the city, contributing to the city economy. They are mainly in the field of general engineering, foundry, electrical, steel casting, electronics, chemical, refractory, etc. With the proposal of industrial area of about 350 acres at Tupudana phase III, Namkum and Gitalsud, industrial activity is likely to expand.

This study will focus on the relevance of the Chhotanagpur tenancy act in modern day context and how it has affected the housing sector of the city. The land tenure is governed under the Chhotanagpur Tenancy Act which prohibits transfer of tribal land to non-tribal people and thus limits overall land supply within the city. The act is applicable in the entire state which also includes urban areas and a major proportion of land comes under the jurisdiction of CNT act. Ideally, the tribal population should own that land but after the creation of Jharkhand, illegal buying, selling and capturing of land took place and which is still going on. According to Ranchi Municipal Corporation (RMC) 34% of the total population live in slums and there are 205 slums and around 60% of the slums are non tenable (are located in hazardous environment) in Ranchi. The city’s population has crossed the 3 million mark and grew by more than 23% in the last decade. Now-a-days, sustainability of housing sector is now being considered as a crucial factor in urban planning. Creation of SEZ, educational institutions, tourism related activities, health specialty facilities and IT are seen as potential economic development opportunities. This makes it even more necessary for the city to have a sound infrastructure to make the most of it and housing should be its first priority.

BACKGROUND OF URBANIZATION IN INDIA

India, the world’s largest democracy, is home to 1.2 billion people, the world’s second-largest population, following none other than the emerging economic powerhouse, China. This growing population has rapidly fuelled the process of urbanization. With 31 out of every 100 people in the country living in cities or towns, around 377 million people live in urban areas at present.

As the economy of India grows, its urban centres shall continue to grow and develop. Ironically, despite being in the development phase, the allocation for housing and urban development has never crossed 4.9%. The Fifth Five Year Plan allocated 2.9%, the second highest. It was only 60 years after
independence that due importance to urban development was
recognized and a structured mission, the Jawaharlal National
Urban Renewal Mission (JnNURM), was focused on upgrading
India’s urban centers. The mission puts in place a reform driven,
fast-track, planned development for identified cities, focusing on
infrastructure service and delivery and community participation.

The integration of the Indian economy with that of the world
following the liberalization in 1991 has seen ongoing urban
expansion, albeit the pace and potential of this growth has con-
stantly been the centre of much debate. It is estimated that by
2040, 40% of the country’s population will be living in urban
areas. A key question constantly challenging the pace of India’s
growth is that of the proficiency displayed by Indian states
and cities to provide the necessary framework to support this
economic growth and, at the same time, provide the citizens a
good standard of living.

HOUSING IN INDIA

According to the Ministry of Housing and Urban Poverty Alle-
viation (MHUPA), the housing shortage in urban India has been
estimated at 18.78 million households living in unacceptable
dwelling units in 2012, a decline of 5.93 million from the 2007
estimation of 24.71 million. The drop in housing demand cor-
responds to the period, which has seen the sharpest decline in
decadal growth rate of population by 3.90% from 21.54% (1991-
2001) to 17.64% (2001-2011). Providing housing at more affordable
prices to cater to the economically weaker section (EWS), lower
income group (LIG) segment has traditionally been the responsi-
bility of the Government. Entry of the private sector to cater
to this segment, coupled with ease of getting housing finance
to lower segments of the society, along with state government
reforms and policies is likely to be the solution to bridging the
housing shortage gap. The Planning Commission of India’s
report in the 11th Five Year Plan reveals that currently there is a
need to provide 32 million units of housing to meet the needs of
India’s homeless. Broken down, it’s 24.71 million units in urban
areas and a 7 million units® shortage in rural areas. Though one
must remember that it isn’t a shortage of housing for the poor
alone, but for the middle and upper class as well that leads us to
the sum total of housing requirement.

ROLE OF HOUSING

As per a Central Statistical Organisation (CSO) estimate, the
Housing Sector contributed 4.5% to India’s Gross Domestic
Product (GDP) in 2003-04 at current prices. The contribution
of housing in urban areas to the GDP in 2003-04 was 3.13%. Further,
the spotlight is focused on the fact that 16% of the Indian
work force is engaged in Construction and Transport Sectors. It
is estimated that overall employment generation in the economy
on account of additional investment in the Construction/
Housing Sectors is eight times the direct employment. In view of
the substantial use of cement, steel, marble/ceramic tiles, electric-
ical wiring, PVC pipes and various types of fittings; construction
activity has a multiplier effect on industrial demand for these
items.

At the advent of the 21st Century (2001), the housing stock
in India stood at 50.95 million for 55.8 million urban households.
A significant segment of this housing stock was characterized
by congestion and obsolescence. Congestion is particularly
acute in inner city slums and peripheral slums. According to the
Census 2001, 61.82 million persons or 23.1% of the urban pop-
ulation resides in slums. The quality of housing stock in slums
is extremely poor. An important reason for this is insecurity of
tenure. Slums are also severely deficient in basic services such as
potable water, sanitation, sewerage, storm water drainage and
solid waste disposal. Given the degraded habitat in which slum
dwellers live and the frequent episodes of illness characterizing
slum families, it is of vital importance that special attention is
paid to urban health and hygiene on the one hand and social
and preventive medicine on the other hand. In order to improve
the quality of life in urban areas, it is of critical significance that
the housing stock is improved through urban renewal, in situ
slum improvement and development of new housing stock in
existing cities as well as new townships. Further, the enhance-
ment of housing stock must be accompanied with high quality
provision of basic services. It is a well established fact that safe,
hygienic and spacious provisioning of housing duly buttressed
with adequate basic services and a congenial habitat promotes
significant improvement in productivity of workers.

CITY PROFILE-RANCHI

‘Ranchi’ the Capital City of the newly formed Jharkhand State,
which is known for its rich deposits of minerals, waterfalls,
rivers, streams, lakes, dams and forests. Ranchi situated on the
Chhotanagpur Plateau, located at 23’23” N latitude & 85’23” E longitude. The capital lies 2140 ft. (avg. 645m) above MSL, on undulating topography. It has a moderate climate where the summer temperature ranges from 20° to 37° and from 2.8° to 23° during winters. The humidity ranges from 39% to 86%, average annual rainfall recorded is 1530 mm.

DEMOGRAPHIC PROFILE
The portion of people living in urban areas continues to rise. According to the 2001 Census, 27.8% of the population reside in cities, compared with 25.5% in 1990. The urban population is expected to rise to about 40% by 2020.

The urbanisation rate for the state of Jharkhand is 22.25% (ratio of urban population to total population) at present, and which is expected to go up to 28.8% by year 2026.

WHERE ARE WE HEADING TO
The population of Ranchi Urban area is computed to be 9.77 Lacs as per 2001 Census. The present urban population (2011) of Ranchi is 12.50 Lacs. During the previous decade (1991-2001), the population of the city has grown from 5.99 Lac to 8.46 Lac. This above average growth at 4.12% of the city is primarily due to in-migration

By 2021, the decadal growth would be 41% and will continue to be till 2031 which shows how rapidly the population has grown and will grow in the coming future. With this rate of population growth it would be very difficult for the city to sustain. Ranchi will be a part of an upcoming SEZ and which calls for adequate land supply for businesses to grow.

HOW WE CAME TO THIS SITUATION
BECOMING THE CAPITAL
Ranchi has witnessed a huge influx of people after the formation of Jharkhand State on November 15, 2000 owing to the rising employment opportunities and opening of numerous regional and state level offices, banks, and private organisations in the city. All this has also put pressure on the existing systems. But, land acquisition is one huge trouble for Ranchi, as land holders of the State are reticent to let go their land for setting up of industries. This is one reason why Jharkhand is forced to take only tiny steps on the path of development. In real estate sector alone, there is a huge demand of space in sectors like banking, insurance, education, finance and telecom. According to an estimate, more than 10 million sq ft structure is being created to meet the demand.

This paucity of space in fact is a huge indicator of infrastructural bottlenecks the city is currently grappling. The State Government too has decided to develop a new capital township - Greater Ranchi - to meet the growing demand of rapid urbanisation.

GROWTH CONSTRAINTS
Tribal lands inside the city area are in abundance, which is non-
transferable outside the Tribal community to any non-Tribal agency as per the Chhotanagpur Tenancy Act (CNT). This restrict the city to grow on the underutilized land that is available, this land is therefore inaccessible for any planned growth. The vertical growth of the existing city cannot be ignored in the near future, as the land transfers, acquisition are in progress, thus resulting in a few high rise buildings of 10-12 stories height. The constraints to the vertical growth are the poor infrastructure conditions, as the roads are narrow and overcrowded with the present population itself. The cantonment area in the vicinity, on north-east and east-south-east edge of the city restricts the city growth beyond its limits by pushing it physiologically to a far off place from the heart of the city. Any growth beyond these bounds is likely to be treated as a sub-city. This sub-city must be self-sustainable in terms of economic, commercial, institutional and housing needs.

UNSTABLE GOVERNMENT

It has been 14 years since Jharkhand has come into existence and since then it is suffering from political instability and has seen 9 chief ministers in such a short span. Till date no government has been able to complete its full tenure and that is also one of the reasons why developmental and social welfare activities lagged behind. Unstable government is also considered to be one of the reasons why the CNT act hasn’t been amended since 1995 and no government looked in a position to make a move in this regard.

SOCIAL COMPOSITION

The Average House-hold size is about 5.85 person, this shows a deficiency in the number of housing stock in the city, about 1.5 person per household is involved in work participation (i.e. 26% of population is actively participating in work). 25% of the total population of the city is SC/ST. About 34% of the total population of the city lives in slums, this shows an acute shortfall in provision and access to the optimum infrastructure services in the city. About 66% of slum dwellers are SC/ST. The average household size of SC/ST is 5.32. Predominantly the slums comprise of Tribal villages of the past, enveloped by the growing city all around in due course of time. Only a few of the slums are unauthorised. As per the data available with the Planning Commission of India the total number of urban poor (below poverty line) in the state has reduced from 47% in 1983 to 33% in 2000, the logarithmic projection shows a further decline to 27% by 2021.

In rural Jharkhand around 54% of STs, 57% of SCs are poor whereas 37% of general population is poor. This gap increases between the SC/STs and general population in urban areas as the 9.2% of people are poor whereas more than 45% of SC and ST population are poor even if they have their land.

Those who cannot afford a space in a slum continue to remain homeless, being forced to live on pavements, railway platforms, under flyovers, and in other precarious conditions. The Supreme Court and the High Court of Delhi have played a very positive role through progressive interim orders protecting the rights of the homeless and calling for state action. While this has resulted in positive responses from a few state governments, the failure to implement these orders is widespread and India’s homeless population continues to rise and is excluded from most government schemes. Homeless people are routinely criminalised and brutalised by the police, including through targeted acts of violence and the implementation of the Bombay Prevention of Begging Act, 1959.7

ROLE OF LAND

Land is seen as providing a vital economic and social foundation for development. In India, land scarcity poses a huge barrier to all infrastructural development. Its efficient utilisation plays a key role in increasing our agricultural output, conversely related to the incomes of the majority of our populace. Since India’s economy thrives primarily on agriculture, equitable distribution of land and secure land rights can be viewed as instrumental in empowering the urban and rural poor; to enable them to meet ongoing changes posed by a rapidly globalizing world. A major concern of citizens today stems from the lack of availability and inflated prices of land; the residual effect of which is lack of availability of land for housing, developmental and economic activities. Is it land scarcity or the mismanagement of land available that has led to this; two pivotal questions policy makers must address in seeking solutions for this crisis. When we take the case of Jharkhand we can easily say that Jharkhand has ample amount of land but has been made inaccessible for most of the people as prices have gone up. CNT act has restricted people from buying land and only a limited amount of land is available and residential projects don’t come up because the land was under some kind of litigation. According to the data provided by the Town Planning Division around 700 applications, mostly for residential purpose was rejected because it had issues related to land.

WHAT IS CNT ACT AND ITS MAJOR PROVISIONS

The Chhotanagpur Tenancy (CNT) Act, enacted in 1908 after the Birsa Movement to govern land issues and prevent land alienation, is supposed to be the Magna Carta for tribal. The blueprint of the act was prepared by John Hoffmann, a missionary social worker. Its operation is effective in North Chhotanagpur, South Chhotanagpur and Palamau divisions, including areas under various municipalities and notified area committees. Legal experts say the CNT Act may be amended by the state legislature on the recommendations of the Tribes Advisory Council (TAC). But the assent of the President will be required since Jharkhand comes under Schedule V of the Constitution. Also, CNT Act has been listed in the Ninth Schedule of the Constitution, which implies it is beyond judicial review

SOME IMPORTANT PROVISIONS

Article 46 and 49 of the CNT Act regulate sale and purchase of tribal land. Section 46 allows tribal to tribal land transfer but with the permission of the Deputy Commissioner.

Contrary to popular belief, the CNT Act also allows transfer of land from tribals to non-tribals under Section 49. This can be

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Contrary to popular belief, the CNT Act also allows transfer of land from tribals to non-tribals under Section 49. This can be
done only for industries or agriculture. Restrictions and procedures are specified in the relevant Sections of the Act. As per the Section 49 of the CNT Act, tribal land can be sold to non-tribals but only for the purpose of putting up industries or for agriculture work — but in this case the permission requirement has been changed. Rather than deputy commissioners (as provided in the original Act), permission is needed from the revenue department.

There is also a provision that the Government can withdraw land transfer if it is not used for industrial and public purposes like hospitals or schools. But there are numerous cases where the land was used otherwise.

These two provisions, coupled with the unfettered power of the state to acquire land in "public interest", have undoubtedly led to the alienation of vast tracts of tribal land throughout the state. This has happened in spite of the revenue department’s fixed ceilings for different areas, below which rate no land can be registered.

Section 71 of the Act offers relief against fraudulent purchases. The victim can apply for restoration of land under this Section. Prime plots owned by the tribal in urban areas like Ranchi are always eyed by non-tribal builders who would like acquire such plots and then sell them after development at higher prices.

Section 241 of the CNT Act permits transfer of Mundari-Khuttkatti land for certain purposes but with the prior permission of the deputy commissioner. Incidentally, the aluminum giant Hindalco has been eyeing land that falls in this category. Note that the Mundari-Khuttkatti lands are plots developed for agricultural purpose by tribal over decades for their own use.

**TRIBAL PERSPECTIVE ON CNT ACT**

The tribal community believes that CNT act is there to protect them from outsiders and save their lands. There has been a lot of exploitation of the tribal community and most of the times they were on the losing side. The Chhotanagpur Tenancy (CNT) Act is one of several laws provided by the Constitution to safeguard tribal interests. The law was meant to prevent foreseeable dispossession, and preserve tribal identity. Loss of land would naturally lead to loss of tribal identity as the issuance of a community certificate requires proof of land possession. The tribal community believe that the previous amendments have made the act weaker and hence no further amendments in this act must be done. Some social activists believe that the government should compensate the tribal for the low prices of land.

**BUILDERS PERSPECTIVE**

A major proportion of land in urban areas comes under the jurisdiction of CNT act and only 11-12% of the total land area being transferable due to the this act apart from lease land, government land, the state needs to open up more lands for development through necessary amendments in this act.

Since real estate sector is the worst hit by the CNT act and they are the one who are demanding amendments. Due to unavailability of land the prices of land are going up day by day and in most of the cases the cost of land of exceeds 50% of the total cost. The builder community wants at least CNT act to be removed from urban areas as they feel it is important for a city to have ample amount of land. Now-a-days people want to buy apartments with proper amenities which calls for more land and the cost of providing these facilities are very high and affecting their profitability. Many builders want to introduce the eco friendly housing in Ranchi but because of land constraints they

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<th>Landuse</th>
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are not able to do that. Builders also believe that government should remove the extremely backward castes. Failure of government in developing a sub urban is also causing them problems and not allowing them to come up with more projects.

**MOTIVATION**

On 15th November 2000 the state of Jharkhand came into existence after a long struggle in the 20th century through various movements for a separate state. The capital city of any state has to cater to the needs of the people of the whole state. An effort has been made to work out vision for the development of the town for the next 20-25 years with benchmarks at 2011 and 2021, with the following assumptions to compute the land requirement of the future:

I. 41% decadal growth rate for the present city till 2011.
II. The present city core grows at 20% decadal growth rate on account of natural population increase till 2021.
III. The present city core grows at 15% decadal growth rate on account of natural population increase till 2031.

As we can see in the above table, in the coming 8 years the city will be needing additional 4064 hectares of land and 40% of the land will be needed for residential purposes. The main reason for the increase in demand being economic activities that has started taking place which has generated employment but this boom has severely affected the dreams of many poor families of owning land and constructing houses. Ranchi has established itself as the educational hub of the state. Students from various districts come here to study as the city boasts of many reputed educational institutions.

The main reason behind choosing this topic was the impact that this act has made on the housing sector of the state and the attention that this act managed to grab by the media and also the government because this act directly affects the common man as well as the infrastructure sector of the state. The city is expected to grow at higher rate as evident in the previous years. This population growth could be attributed to:

I. Natural decadal growth of population @ 21.3% (assumed to be equal to the growth rate of the nation)
II. Setting up of administrative capital for newly formed Jharkhand State (functional & support system, infrastructure development / augmentation of existing system).
III. Jurisdictional Change: Proposed expansion of Municipal Limits to envelop about 1.57 Lac population surrounding the present Ranchi. (It is assumed the said is materialised by the next year).
IV. In-migration in anticipation of employment generation, In-migration in anticipation of development of educational hub of the state
V. This growth is posing serious threats to the sustainability of the city and also raises question on how the city is going to provide shelters to people if there will not be enough land to accommodate these people but there several growth constraints which is not allowing the city to develop and keep pace with the demand.

If we analyze these constraints discussed so far, we will find that using the unused land which already available looks a better and an easier option as well as compared to developing a new sub-city and improving infrastructure which will need heavy amount of investments. Ranchi is also coming up with the new ‘Master Plan 2037’ which is also facing problems due to CNT act which is supposed to develop the city’s infrastructure which includes housing, transportation etc.

All these factors and developments that have taken place in the state drew my attention and inspired me to do research on this topic.

**OBJECTIVES AND SCOPE**

Research objectives are as follows:

i. To assess the impact made by the CNT Act on the housing sector (both private and public).
ii. To survey the housing conditions of Economically Weaker Sections (EWS) of the society (both CNT and non-CNT castes).
iii. To check whether the government programmes for housing have been affected by CNT act.
iv. To measure the efficacy of this act in the modern day context and to see whether this act is relevant in the present form.

**DESCRIPTION OF RESEARCH WORK**

The research question of this paper which is ‘Is the Chhotanagpur Tenancy Act an obstacle in the development of housing sector?’ will focus on the effects of Chhotanagpur Tenancy Act on the housing sector of the city and the idea is to analyse whether CNT act is the major factor responsible for housing shortages. The research will be carried out to seek answers to all these questions which affect the lives of common man and will also shape the future of the city as well as the state. Reforms for simplification of legal and procedural framework for conversion of agricultural land, should not be seen in isolation, but as part of the overall package of reforms in land and property markets.

**EXPECTED OUTCOMES**

This research project expects to have following outcomes by the end of the project.

I. To generate information from professional, government officials, builders and common people as to understand what they perceive of this issue.
II. To examine the housing conditions of people and how CNT act is affecting it.
III. To determine whether housing is unaffordable for the poor sections of the society due high land prices.

**METHODOLOGY**

The study carried out in this paper has mainly been done through primary survey and secondary data.
The primary survey included filling up of questionnaire (in the annexure) and they were divided into 2 groups, the first group featured 147 landless poor living in slums (Harijan Mohalla and Tum Tum Toli) of the city. These people belonged to various castes which do not come under CNT act list. The second group featured 63 people from tribal community having land but belong to the economically weaker section of the society living in slums (Lowadih). Castes of the people surveyed in this group featured in the CNT act.

Major stakeholders were also interviewed which included Social activist, Expert on CNT act, Politician and Builders during the process. Their experiences have also been mentioned as a part of the report.

The secondary data included in the paper gives an overview to the overview of the housing sector in the city. The data, facts and figures used in the paper is taken from a genuine source like research paper from planning commission, interviews and reports published in reputed journals and newspaper which has been duly mentioned in the references section. The secondary data gives an analysis or reasons for the current state of housing sector in the city.

Analysis of both primary and secondary data yields results which have been presented in a lucid manner for better understanding. Measures and suggestions for the improvement have been included for the same.

LIMITATIONS

I. LIMITED AVAILABILITY OF DATA- There is not much data available on this topic. A lack of data or of reliable data will limit the scope of my analysis and also the size of my sample. It can be a significant obstacle in finding a trend and a meaningful relationship. Lack of reliable data can also affect the accuracy and interpretation of results.

II. SMALL SAMPLE SIZE – As I am the only one who is working on this project so it will be difficult for me to cover a larger sample. This will make it difficult to find significant relationships from the data, as statistical tests normally require a larger sample size to ensure a representative distribution of the population and to be considered representative of groups of people to whom results will be generalized or transferred.

III. LACK OF PRIOR RESEARCH ON THIS TOPIC- Though it is a burning issue in the state but still there not much documented research work available on this topic. Prior research studies forms the basis of literature review and helps to lay a foundation for understanding the research problem. Academicians from local colleges have done research on this topic but those research papers are not yet published and hence can’t be accessed.

ANALYSIS OF GROUP 1

INCOME LEVEL

Out of the total people surveyed in this, 82% of them belonged to the income level of less than 60000 per annum and only 18% of them were earning more than 60000 but less than 90000. The following graph shows the income levels of people belonging to this group.

INTERPRETATION- As we can see that the people in this group are extremely poor and because of that they tend to save less, in many cases the savings rate was less than 10% even after getting subsidized food grains under Public Distribution System (PDS). Since people in this group consisted of fair amount of migrants and hence they don’t posses wealth in a form of any asset which makes even more difficult for them to buy any amount of land so that they can at least avail the benefits of housing programmes.
YEARS OF RESIDENCE IN RANCHI
Out of the total people 58% people were living in Ranchi for more than 15 years i.e before the formation of Jharkhand. 20% of migrants were staying in Ranchi between 7-14 years and the rest 22% were staying in Ranchi for less than 7 years and these people are the ones who migrated from various parts of Jharkhand and Bihar.
INTERPRETATION- Even when a majority of people in this group were staying here for more than 15 years and on being asked on the fact that why didn’t they buy land and their response was that the rent was so low that they didn’t even consider buying land here and after the formation of Jharkhand the prices of land went up at a very fast pace and with that rents also increased.

RENT
Out of the total people surveyed 54% people from this particular slum are spending between 40-60% of their income as rent and in most of the cases they were living in Kutcha houses because of extended family size. 22% of people were spending between 20-40% of their income as rent as their family size was less than 7 in most of the cases. The rest 24% were spending less than 20% of their income on rent but the housing conditions were very poor.
INTERPRETATION- As we can see that people in this group are spending a very high proportion of their income in paying rent which has hampered their savings. This percentage was very before 2000, as people used to spend only up to 10% of their income in rent but now the situation has changed drastically. People are bound to spend a high percentage of their income in rent and are still living in Kutcha houses.

LAND OWNERSHIP
Out of the total people surveyed 78% were landless. 14% of the people owned some amount of illegal land and in these cases there was a violation of CNT act. The remaining 8% of the people owned less than 300 sq ft of land which means they cannot avail the benefit from government under the Basic Services for Urban Poor (BSUP). Under the BSUP, a beneficiary must have at least 300 sq ft of land. In this group no family was eligible for BSUP.
INTERPRETATION- We can conclude from the data that each and every family in some or the other way cannot avail the benefits of government housing programmes. Owning 300 sq. ft land or more than that has become very difficult for the people in this group as it’ll cost them around 7-8 lacs as the land prices are very high and had CNT act not been there, these people would have got that much amount of land for a mere 1.5-2 lacs which would have made it possible for them to buy that much amount of land and get the benefits of BSUP.

HOUSING CONDITIONS
Out of the total people surveyed, 76% people said that they were living in bad conditions or in other words they were not satisfied with their houses in which they were currently living and all of them were living in ‘Kutcha’ houses. 11% of the people surveyed feel that their housing conditions are manageable as they were living in semi Pucca houses and rest 13% felt that their housing conditions are good as they were living in Pucca houses.
INTERPRETATION- The data clearly shows that the people are not at all satisfied with their housing conditions and are forced to live in Kutcha houses even after spending a large proportion of their income in rent. These people continue to live in houses.
which were built many years ago and these houses are in a very bad state and can collapse any day.

**GROUP 2- PEOPLE HAVING LAND BUT POOR**

**INCOME LEVEL**
Out of the total families surveyed in this group, 64% of people were earning less than Rs.60000 and 24% people were earning between 60000 to 90000. Only 12% of families were earning between 90000-120000 and that too because more than multiple sources of income but they all had a family of 7 or more people.

**INTERPRETATION**- As we can see that the people in this group are also very poor but their savings rate was slightly better as the savings rate was around 20% and because of in many cases the savings rate was less than 10% even after getting subsidized food grains under Public Distribution System (PDS). Since people in this group consisted of fair amount of migrants and hence they don’t posses wealth in a form of any asset which makes even more difficult for them to buy any amount of land so that they can at least avail the benefits of housing programmes.

**YEARS OF RESIDENCE IN RANCHI**
Out of the total families surveyed 91% were indigenous communities and they were living here for at least 2 generations and the rest 9% were migrants who came to Ranchi after 1995. These people came from nearby districts in search of job and eventually settled here. These migrants have also violated the CNT act by buying land outside their police station area and they have built a Kutcha house there.

**INTERPRETATION**- As we can see that almost all the families are indigenous communities and the rest are staying here for a reasonable period of time and even after staying there for so many year and owning reasonable amount of land at a prime location in Ranchi they couldn’t build a pucca house on their own.

**LAND OWNERSHIP**
The average land holdings, of the families surveyed, was around 4-5 katthas or 2940-3675 sq ft or 7-9 decimals. Out of the total families surveyed 18% families owned less than 2 katthas. 43% families owned between 2-6 katthas and the rest 39% people owned between 6-10 katthas of land. As we can see that the land ownership is considerably large keeping in mind the financial status of the people in this group.

**INTERPRETATION**- Even though the average land holding of people in this group is around 4-5 katthas which reasonably large given the fact that their land is located in the prime location and the total worth of their land is very high and even a small portion of land is enough to take them out of poverty.

**HOUSING CONDITIONS**
Out of the total families surveyed all of them were BSUP beneficiaries. 12% of the total families availed the benefits of BSUP but they had to put more money in order to complete the house and in some cases people had to sell a portion of their land to complete their house but now they are satisfied with their houses. The remaining 88% beneficiaries were in the process of availing benefits of BSUP and their houses are under construction and they are considering their options on how to complete the con-
Banks and Cooperative Banks functioning in the State. The share has decreased from Rs 2,891.55 crores to Rs 2,065.09 crores during the half-yearly period.

Bank, have sanctioned only 3.91 per cent of their loans to STs during the half-yearly period.

The reason is not tough to mark upon and banking fraternities of the State admit that fortifying provisions in the CNT Act had been the discouraging factor as far as approval of credit to the marginalised section of society is concerned and the provisions (in the Act) are so stringent and also politically sensitive that officials say ‘nothing is possible’. After all, banks can only mortgage when they keep something as security in return.

Denying loan has resulted into lagged development of tribal land. People associated with tribal welfare organisations also admit that several pieces of land, carrying immense commercial value, are lying fallow in search of resources and thus being deprived of a handsome income prospect. Provision in the Act should certainly be relaxed in a way that it can pave way for loan against the land. At least the tribal can earn rent if not sell the flat to someone else.

CONTRIBUTION

There was not much research work done on this topic before and any research prior to this and this probably is the first research where the effects of CNT act on the housing sector has been analysed. The research included everyone related directly or indirectly to the research.

The general assumption on the view of tribal was that they also don’t want to sell their land but in reality they don’t get good prices and that’s why they were not in favour of selling their land but if given good prices they said that they’ll consider selling their land.

CONCLUSION

After evaluating the primary and secondary data which included field work and analysing various research papers and articles, we can draw the following conclusions-

The Act needs amendment: It has been more than 100 years since the act was enacted and almost 30 years when amended last time, few provisions to restrict the sale of land are ambiguous restrictive provisions appear out of sync with today’s realities but before that government should settle disputes regarding illegal transfers of land.

Severe housing shortage- After analysing the facts and figures of the housing sector we can easily conclude that the city and the state are facing severe housing shortage and huge amount of backlog work is pending. The reason for housing shortages is land crisis or unavailability of land so that people can build houses on that and the land which is available is available is be coming out of reach. Many residential projects get rejected due issues related to land and the house. The widely accepted reason is CNT act only. The present deficiency of housing other than Slum category is 16,444 (=24,542-34% Slum), which requires about 940 Ha of land @ 100 ppHa. The present deficiency of
housing for BPL category is 19,769, which requires about 864 Ha of land @ 130 ppHa.

**Land prices are extremely high**- In Ranchi the land prices are extremely high because of CNT act. The CNT free land is limited and there is a huge gap in the demand and supply. The land prices vary up to 6 times in the same locality as compared to land which comes under CNT act. This makes it all the more difficult for the economically weaker sections of a society to have a home. People who belong to low income groups end up living in rented houses or violate the act.

**Tribal community aren’t better off with CNT act**- Empirical evidences suggest that the average land holdings of the tribal have gone down over the years and they are being exploited by their powerful people and buy their land at a very low price. The land prices which comes under CNT act is 4 lacs/kattha and land which is free from CNT costs 19 lacs/kattha. The primary data also supported this fact as a healthy percentage of the sample said they might consider selling or will sell their land at good prices. The tribal community in Urban as well as rural areas, poverty in urban areas can be eradicated if they get good jobs or even if they consider selling a small portion of land which can fetch them money and they can get out of poverty.

**WAY FORWARD**

After analysing the current conditions and future requirements we can easily conclude that the city cannot grow in a planned manner as unavailability of land is not allowing the horizontal growth of the city.

These land tenancy Acts were intended to protect the poor tribal but they have failed in fulfilling their purpose and the tribal community are still poverty stricken even after being the owners of the land. The land holding of tribal have gone down drastically which also shows the under-achievement of CNT act but amending the act won’t be enough the government and the implementing bodies that the execution and implementation of the law and keep an eye on the developments in this regard. Now it has become all the more necessary to take care of the tribal community and save them from any further exploitation and for that government will have bring out them from poverty or else it would be very difficult to save them from any future damage to their livelihoods.

**Provisions regarding land transfer should be changed:** This has been a popular demand by the builder community and in fact some tribal also feel that this provision must be removed so that it would be easier for them to buy land anywhere. Currently one can only buy land within his police station area. During the British rule when this act was enacted, there were less police station and because of that the area under one police station was considerably large but after independence the number of police started increasing and consequently the area within the police station became smaller. In today’s situation of increased mobility, a tribal should be allowed to sell his land to another tribal living anywhere within the state boundary.

**Leasing period is small:** The period of land lease is also restrict-
ed under the Section 46 of CNT act; the period is 5 years and it cannot be leased for more than five years and can only be used for limited purpose such as agriculture, horticulture, etc. Experts are completely against this and believe this prohibits proper land use which is already limited and it also makes it difficult to take loans from banks.

**Keeping only extremely Backward Class:** There are many cases which are listed in the CNT act but are no more extremely backward and hence should be removed from the list as it will increase the supply of land.

**Increase Compensation:** The compensation provisions for sale of land which was introduced in 1970 also need revision to incorporate the current rates and if government acquires land belonging to a tribal then he must be compensated fairly.

**Streamline Maintenance of Land Records:** Government must maintain records of lands properly and it would be appropriate to use modern technology for this. It has also been argued that the tenancy laws are complicated and detailed records had not been maintained over the years. If the records were streamlined and well maintained, there wouldn’t have been much difficulty.

**Redefine the Jurisdiction of the CNT Act:** The government should consider fresh demarcation of scheduled areas that decides the implementation of the Act – scheduled areas have not been demarcated for a long period of time. If the government can notify the scheduled areas in consonance with the percentage of population of the scheduled category, a lot of problem would be solved.

**ANNEXURE**

**PERSPECTIVE OF ULB**

**INTERVIEW OF DEPUTY MAYOR**

- Do you believe that the city has evolved in a planned way? If not what could be the possible reasons according to you?
  
  No I don’t think that Ranchi has evolved in a planned way, There are many reasons for this
  
  The most obvious one that we can think of is the absence of a stable government in Jharkhand. It has been 14 years since Jharkhand was formed but we have seen 9 chief ministers in this span. Before the formation of Jharkhand the population of Ranchi was used to be very low, but after becoming the capital the population started increasing at a very fast pace and the city couldn’t really cope up by providing adequate infrastructure (housing, roads, sewage facilities).

  Apart from this the CNT act has been one of the major obstacles in developing the city’s infrastructure. Housing and industries are worst affected sectors from the CNT act. As
  
  - Could you please throw some light on the relevance of CNT act especially in urban areas in the modern day context?
  
  CNT act has always been a debatable topic in the state, What I personally feel is that CNT act should be removed if not completely then atleast from urban areas because situation has changed and we need to develop our cities in order to prevent congestion and accommodate the increasing population to keep the economy running. Ranchi has also ex-
The experienced migration of unskilled labour from all across the state and these people are living in the city by making slums and remain landless because the prices of land are very high.

- What could be the possible reason for the mismatch in the demand and supply of land in Ranchi?
  Look, the only major reason that can be given is CNT act. There is adequate land available in the city but because of CNT act that land has become inaccessible for housing and other developmental purposes.

- Do you think the time has come to revise the caste list of CNT act and keep only extremely backward castes for cities at least?
  Absolutely, there many castes which are no more extremely backward but they still feature in the CNT act list. Govt. should revise the caste list in order to free up the land which can be used for developmental purposes.

- Empirical evidence suggests that the average land holding has decreased overtime among tribal people. Do you think that CNT ACT is enough ensure land holdings of the tribal people?
  Yes, it is true that the land holdings of the tribal people have gone down over the years. Their ownership has come down drastically all thanks to illegal buying and selling of land and we have reached to that situation where only a stable government can solve this issue.

- Wouldn’t this act will make more sense if a minimum limit is reduced in urban areas set for people belonging to the tribal community say 2 katthas(1 kattha=720 sq. ft), if a family has 2 or less than 2 katthas of land cannot sell it?
  Yes, this makes complete sense. This proposal can actually solve the problem government should look into this proposal; this can actually solve the land crisis of the city and the state.

- Do you think that the act is hurting the tribal people who want to migrate from villages and settle in cities?
  Yes it is hurting the tribal migrants who come here in search of jobs and since they cannot buy land in other police station and that is the reason they cannot settle in cities permanently.

- Do you feel the tribal community is better off in terms of the price that they get when they sell their land?
  Not at all, if you see the difference in prices of land which is CNT free and the one which comes under CNT act, it varies from 4-8 times. So you can clearly see that the tribal community is the one who is losing out on the opportunity that the economic growth of the city is providing.

**Questionnaire for CNT castes- EWS owning land and availing benefits of BSUP**

1. Gender:
   - Male/Female
2. Age:
3. How much is your family’s annual income?
   - 0-30000/30000-60000/60000-90000
4. For how many years your family is staying?
   - 0-7 years/7-14 years/indigenous
5. How much land does your family own?
   - Less than 2 katthas/ 2-6 katthas/ 6-10 katthas
6. Can you describe your current housing conditions?
   - Good/ Bad/ Manageable
7. Will you consider selling your land if offered good prices?
   - Yes/ No/ Maybe

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IMPACT ASSESSMENT OF STATION AREA TRAFFIC IMPROVEMENT SCHEME (SATIS), THANE

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ABSTRACT
Urban transportation in the city of Thane has not been able to deliver basic facilities to its commuters. Situation is alarming around the railway station area which is characterized by mixed use of land with diverse economic activities. Despite several procedural and structural interventions aimed at improvement of mobility the present conditions are far from abating. This paper is an attempt to assess one such intervention known as Station Area Traffic Improvement Scheme (SATIS) under which additional space was created by constructing a low level deck and sky walk in front of railway station exclusively for public transport and pedestrians respectively. This study therefore explores the question -whether and how has the implementation of scheme addressed mobility problems around the station area. The methodology used to address these questions has greater emphasis on primary data collection using tools of qualitative research. The paper concludes that engineered optimal interventions are not necessarily ‘the solution’ for the issues of urban transport.

INTRODUCTION
Urban India is in the limelight in the recent years for driving country’s growth and is expected to contribute 70 per cent of India’s GDP over the next twenty years. According to Census 2011, there are 53 million plus cities and number of census towns are close to eight thousand. This phenomenon of urbanization and related growth is affecting and shaping the needs and demands for safe, affordable, quick and reliable transport system. In developing countries like India supply of transport infrastructure has not been able to cope up with demand. Escalation of travel demand in urban area is driven by agglomeration of various economic activities as well as services provided by cities. Urban transport system in many Indian cities face major challenges due to continuous growth in urban population, declining share of public transport, increasing private vehicle ownership leading to congestion and pollution, accidents and safety issues. This induces difficulties for non-motorized transport. More often these difficulties are either the direct outcome of high level of motorization which impairs mobility of pedestrian and bicycles or obvious disregard for non-motorized transport in the planning of urban transport infrastructure by authorities. Hence, urban transport is becoming a binding constraint on economic growth as well as social development and inclusion with negative consequences on health and environment.

THANE CITY
Thane became an important industrial city in late 1960s. It had many advantages but being close to Mumbai was the most important. Thane had good road and rail links to Mumbai and the rest of Maharashtra as well as India. Thane had large tracks of agricultural lands available for urban expansion. Working people from Mumbai could easily travel to Thane for work due to the suburban train service. Once the initial industrial activity was well grounded in 60s people were attracted to settle here. As a result population of Thane city doubled in between 1971-81 from 2.07 lakh to 4.32 lakh. Once again it almost doubled to 8.03 lakh in 1991 (Mahajan, 2003).

At present Thane city is home for about 18 lakh people (Census 2011). Thane district as a whole has registered the highest decadal population growth rate of 35.94% in the country (Census 2011). Thane Municipal Corporation (TMC) administers an area of 147 km2. City is included in Mumbai Metropolitan Region and is one of the eighteen urban centers therein. Being the first and significant urban center in the periphery of Mumbai, the city occupies a unique position in the region and serves as a gateway to Mumbai. City provides benefits such as relatively low cost housing, excellent connectivity via rail as well as road to Mumbai and other parts of state. Thus city is becoming preferred destination not only for residential projects but also for commercial development dominated by service industry in recent years. Travel demand in the city is increasingly being driven up by residential and commercial projects. Local bus transport with its limited fleet and operational issues has failed to meet the demand that has resulted into proliferation of private and intermediate private transportation, putting a severe stress on available transport infrastructure (Lea Associates, 2010).

STATION AREA TRAFFIC IMPROVEMENT SCHEME FOR THANE
The densification of station area post 1980’s due to new structures (authorized/unauthorized) of tall/medium height compounded by narrow lanes and encroachments on streets and footpaths. This situation was worsened by inadequate bus transport, proliferation of private and intermediate transport.

In the 2000-2001 under the able leadership of former municipal commissioner T Chandra Shekhar, TMC demolished all such encroachments and station area started breathing lighter. Again in the 2002 minor improvements in the form of widening and concretization was carried out but this arrangement could not serve the purpose for more than couple of years. Hence, Municipal Corporation proposed station area improvement scheme in 2004. The detailed project report for SATIS has captured following traffic problems around station area:

- Congested Station Area
- Haphazard and crisscross movement of vehicles and pedestrian.
- No safe passage for pedestrians.
- No proper and adequate pick up points for Autos, Taxis and Buses.
- Queuing of Buses up to ST stand because of space constraint in front of station.
- Improperly planned two wheeler parking.
- No streamline movement of traffic
- Inadequacy of space for traffic movement.
- Demand for additional space as well as segregation of traffic
- Need for planning for effective traffic dispersal.

SATIS was implemented envisaging priority and safety to pedestrian and public transport. National Urban Transport Policy 2006 also prioritized pedestrian and public transport with safe, affordable, quick, comfortable, reliable and sustainable access for...
A growing number of city residents to jobs, education, recreation and other needs within cities.

The scheme suggested construction of low level deck in front of Thane railway station exclusively for public transport. The auto rickshaw, taxi and private vehicles shall ply below the said deck within the dedicated lanes.

The adjoining skywalk dedicated to the pedestrian proposed connecting the railway station/ high concentration commercial area to point where concentration of pedestrian prevail. The rationale of skywalk was for efficient dispersal of crowd in the station area to important locations such as bus stops, rickshaw stands, shopping centers etc. and vice versa help decongest the crowded streets around station area.

Traffic studies for the project conducted in 2004, and accordingly following objectives were set to achieve.

- Elimination of crisscross movement of traffic in station area, grade separation of various modes of traffic and thereby improvement in traffic speed.
- Providing dedicated passage to pedestrian movement to encourage non-motorized mode of transport.

**FIGURE 1: HAPHAZARD AND CRISSCROSS MOVEMENT OF DIFFERENT MODES.**

**FIGURE 2: STATION AREA BEFORE SATIS.**
• Providing dedicated passage to public transport to improve functioning and thereby encouraging use of public transport system.
• Avoiding conflicting movement at junction
• Bringing down the pollution levels in Thane Railway Station area.

MOTIVATION
The project was completed despite several concerns raised by citizen groups, experts and diverse stakeholders. The viability of project was also questioned through a public interest litigation in the Bombay High Court. Benefits promised by this project are highly contestable as mobility issues in the station area still persist. Newspaper reports and citizens continue to raise their voice against failure of project and even augmentation of traffic problems in the railway station area. Whereas to this date Thane Municipal Corporation is busy in the increasing capital expenditure on the project by proposing a poly-fabric roof over the SATIS and also contemplating to replicate the scheme on the other parts of the city in the coming years. In the light of these developments a fair assessment of the project would be able to throw light on actual scenario of mobility problems around the station area.

OBJECTIVES OF RESEARCH
This study is aimed at evaluation of SATIS and its role in easing the transport situation surrounding the Thane station. Specific research questions are:
1. What was the traffic scenario before the implementation of SATIS?
2. Has the project been able to deliver what it had promised?
3. What are the learnings can be drawn from the project?

SCOPE OF RESEARCH
This study is will take an account the existing scenario before SATIS with the help of reports and narratives. Two main components of the scheme will be extensively studied. One, the low level deck in front of railway station and second, the sky walk. Based on traffic composition, volume and direction following three main roads approaching the station will be studied to understand the impact of SATIS.
1. Shivaji Path
2. Gokhale Road
3. Dada Patil Road

METHODOLOGY
Data Collection and analysis was divided in two stages. First stage comprised of secondary data collection which involved past studies and surveys undertaken to understand traffic situation in the city. The emphasis was given on following documents:
• Integrated Mobility Plan for the City of Thane by Thane Municipal Corporation (2008)
• City Development Plan by Thane Municipal Corporation (2008).

This stage provided for necessary background and understand-
ing of mobility issues pertaining to city in general and station area in particular. Reports and articles from local newspaper were helpful in understanding the temporal dimension of the project.

The second stage includes deployment of tools from qualitative research methodology for data collection and analysis. There are several methods within qualitative framework through which one can collect data. Selections of apt methods is the most crucial component of the research design as that determines the kind of information required for the study. The following methods and their rationale used for this research are as follows:

1. **Observation (Direct and Indirect)**
   Of the two methods of observation, direct observation was used mainly to understand the site. It included movement of pedestrian on the roads, footpaths and on the sky walk, commuting in public transport buses (Thane Municipal Transport). Direct observation provided a good understanding and experience of the place through the lens of different stakeholders such as pedestrian, private vehicle owner and public transport commuter. Noting the spatial details and integration of different components of project helped to understand the dynamics between an infrastructural project and public space.

2. **Semi-Structured Interviews**
   This method was used to interview various stakeholders like pedestrians, IPT association members, shop owners, traffic inspectors, TMT Traffic Controllers, Bus Drivers and Conductors, and few experts in the field. The advantage of using this method is to understand and probe the impact of SATIS on the daily work/activities of stakeholders involved.

   Keeping in the mind time and resource constraints a representative sample size of 100 was undertaken over different days in a week. Pedestrian interviewed particularly during morning and evening peak hours whereas other stakeholders interviewed during non-peak hours. Of the 100 interviews conducted

Pedestrians – 50
IPT Association Members – 20
Bus Drivers, Conductors and Traffic Controllers – 20
Experts, Activist and TMC Officials – 10

Analysis of the data collected is presented in subsequent section.

3. **Narratives**
   Narrative inquiry was particularly useful for engaging with Auto-rickshaw and Taxi drivers, who have witnessed transition of the place. Impact on business, customer footfall before and after the project is important to understand the challenges and issues posed by this piece of infrastructure.

**Observations**

**Situation Before SATIS**
Thane railway station being one of the oldest and major junction, the land use near the station is highly commercial and road network is very much congested with very little or no scope of expansion. With the city experiencing rapid growth post 1980s local government has failed to decentralize the market area around the station area. According to a report by Mumbai Rail Vikas Corporation Thane emerged as most crowded railway station which sees 6.54 Lakh passengers everyday (Wilber Smith Associates, 2012). Apart from this being the only market area in the city station area attracts a large number of footfall.

The road space in front of the station was shared by various modes such as pedestrians, public transport, intermediate public transport, private vehicles and tongawallas. Dedicated spaces were allocated to different motorized transport by demarcating the lanes. However, this arrangement was posing serious threats to pedestrian’s safety as one has to cross the lanes to catch designated mode of transport. Apparently, all the modes used to converge at the junction of Alok hotel situated at few meters from station resulting in congestion.

Added to this hawkers and encroachment on the footpaths by retail shops compelled pedestrians to take the road for walk.
Previous procedural attempts to clear the clutter such as circular movement of vehicles, stringent action against hawkers and encroachers could not address the issue in its entirety. As a result the station area witnessed traffic movement at snail’s pace, frequent delays and traffic jams, potential threat for pedestrians and subsequent effect on environmental degradation in the form of air and noise pollution. To address these issues Thane Municipal Corporation came up with structural intervention in the form of SATIS aimed at segregating modes of transport and prioritizing public transport.

**SITUATION AFTER SATIS**

**STAKEHOLDER CONSULTATION**

The process of stakeholder consultation has been recently seen with great importance. In order to accommodate stakeholder needs and suggestions into the stage of planning and implementation varied methods of consultation are conducted. Moreover, public consultation is observed as a democratic method to include peoples voices and to understand their needs better. Many experiences in the past have shown that projects often failed to achieve desired objectives due to inadequate consultation with the stakeholders involved. In this study the various stakeholders are as follow: pedestrians, retail shop owners, residents in nearby buildings, local transport operators (TMT), IPT (Rickshaw and Taxi) operators, Traffic police and nonetheless hawkers.

On the similar lines stakeholder’s participation and their views has become an important aspect of infrastructure project in contemporary times. However, this study has found out proper methods of consultation such as public hearing have not been followed in the SATIS project. This observation can be further analyzed in order to find out what kind of announcements are made, the platform of such an announcements and the feasibility of attending such consultation meetings. In this above research it was clearly observed that the vernacular newspaper chosen was not among the highly circulated newspapers. Thus directly resulting in the reduction of public participation in such consultation meetings. Hence we can now draw an analogy how the project has led to unintended consequences and a completely new set of problems.

**THE PEDESTRIAN’S VOICE**

It is observed that of the total the pedestrians surveyed only 40% use sky walk on a regular basis. The reason for regular use of sky walk is attributed to ease of access railway FOB and to avoid congestion. Of the total regular users of sky walk 80% cited it as the quickest way to get to the railway FOB and designated platform to catch the train particularly in the morning peak hours. Therefore, it must be considered that time is an important factor that plays a crucial role in the access of individuals to the skywalk.

One of the major objectives of the project is to ensure pedestrian safety by constructing a sky walk. In its nature it is true that it avoid crisscross movement of pedestrians on heavy traffic lanes. However the relative lower use of the skywalk says there is another reason to tell. In the survey conducted among travelers it was observed that physical structure of the skywalk was inhibitory by nature. Pedestrians complained about the height of the structure particularly the southern side of skywalk which facilitates access to Gokhale road. People in general responded
that they had to undergo a lot of difficulty accessing that specific height. These comments were further analyzed to find out that a commuter has to climb 29 additional steps for sky walk after Railway FOB (Railway FOB is at the height of 38 steps).

This height is almost equivalent to 1.5 floors which discourages a commuter to choose sky walk in spite of less congestion. This clearly indicates that senior citizens, children, differently abled individuals and pregnant women would avoid using the skywalk due to the structural issue. The width of the footpath on the Gokhale road has been compromised due to the ramp of sky walk. Pedestrians have to take a walk on a footpath as narrow as 3 feet, adding to that encroachment by shop owners leaves no option for pedestrian but to take the road for walk.

The other side of the sky walk is extended up to ST stand where up-ramp of low level deck and sky walk are positioned parallel to each other. A pedestrian has to cross a Bus lane in order to get on to the sky walk. It clearly indicates that the criss-cross movement has remained a significant concern even after five years of implementation.

Apart from this people walking towards Shivaji Path have no option of cross highly congested road at Alok hotel junction. Similarly people walking down to and from Ashok talkies on Gokhale road have to cross Alok hotel junction. Following pictures shows the plight of pedestrians on these routes.

In a recent move to avoid congestion at Alok Hotel junction circular pattern of movement has been implemented. As a result
pedestrian’s mobility has been jeopardized as they have to cross the junction through an opening which is as narrow as 2 feet.

Further, in the analysis of the pedestrian survey one important emerging aspect is of the relative preference given to choose between a sky walk and a road.

There is trade-off between attractors and obstacles amongst pedestrians observed during a specific time of the day. In the morning time respondents preferred to take the sky walk to reach the railway platform citing the urgency to reach the office. Whereas, the same respondents prefer to take the road in the evening in spite of the congestion, inadequate footpaths and compromising safety. From the received responses it can be seen that this behavior is driven by number of attractors that a road has to offer such as daily utility shopping etc. People prefer to shop for daily utilities on the way back home. Therefore, in this case a specific trade-off between attractors to individual safety is made. This attractor offered by road outweighs the benefits of quick dispersal offered by sky walk.

**IPT ASSOCIATIONS**

Auto-rickshaw and Taxi drivers constitute significant stake-holders in this project. Of the total interviews taken 20% respondents belong to this category. According to all of them SATIS has given rise to major problems that includes increase in traffic congestion, subsequent delays and fuel consumption, health and hygiene concerns. Some of the direct concerns highlighted by IPT stakeholders were that the lower height of the deck prevents sunlight and problem augments in rainy days.

The second issue that was highlighted by the IPT stakeholders was that due to pollution from the exhaust of vehicles leads to suffocation under the bridge. This issue was particularly emphasized by all the respondents as they spend average eight hours daily under the deck. They also raised the concerns of augmenting the pollution and suffocation in the light of upcoming poly-fabric roof over the deck. Vehicular traffic under the bridge is a chaos coupled with frequent traffic jam results into queuing up of Auto-rickshaws. In the peak hours on an average it takes 10 minutes to cover a distance of about 60 meters.

Thirdly the unavailability of public toilet is one of the pressing concern faced by Auto and Taxi drivers. In the process of construction of low level deck, public toilet in front of the railway station was demolished by the municipal corporation. In general the lack of public toilets is also an issue faced by daily commuters.

**BUS DRIVERS AND CONDUCTORS**

Another set of stakeholders includes bus driver and conductor. Of the total interviews taken 20% respondents belong to this category. The idea of SATIS incorporates the separation of public transport. The overall objective in doing this was to increase the speed of travel. Respondents of the utilizers of the upper deck category were relatively satisfied about less congestion and increase in travel speed. However, bottle necks where observed in certain locations. These locations include buses plying towards Agyari lane alight just before Jambhali Naka. This being a busy junction causes congestion in that specific spot. The other arm of the bridge through which buses alight on Dada Patil Marg is very narrow.

It is also an access road to two wheeler parking in the station premises. Open spaces in the buildings on this road have been converted into commercial parking centers by respective owners which sees very heavy traffic during peak hours. On road parking...
is rampant on this road which reduces length of carriageway to around 4 meters that leaves very little space for public buses to maneuver.

The question as of productivity of the plan is still to be worked on. It is questionable how much productive use can be made of the few minutes saved. Breakdown of bus usually leads to queuing up and congestion. Avoiding frequent breakdown is highly avoidable. According to a respondent, often breakdown of bus on the up-ramp causes queuing up of buses up to a distance of 200 meters affecting the other traffic.

The stakeholder consultation is an integral part of any infrastructure project. Participation and deliberation are the key factors for successful implementation of a project. The credibility and acceptance of project increases with participation. However, from the interviews it seems that this process was deliberately undermined and neglected by the civic authority. The traffic situation around station area after five years of implementation of the scheme has gone from bad to worse. Is it the SATIS only to blame? It is true that all the traffic problems around station area cannot be attributed only to SATIS. However, regulating private vehicle population, effective traffic regulation and providing reliable public transport must be the implicit and essential component of the scheme.

**CONCLUSION**

The infrastructure planning and technological solutions excluding economic and social realities is a recipe for failure. This is precisely what has happened with the SATIS within just five years of its implementation. Ignoring the people, their views and requirement of diverse stakeholders has left SATIS as a dead investment while, corporation is busy in approving the expenditure on the same and such new projects elsewhere. Considering the present situation and movement patterns around station area it is essential to restrict and regulate private vehicles on approaching roads during peak hours, curtailing the number of auto rickshaws plying and increasing capacity of public transport simultaneously could help to improve the situation. Acknowledging and accommodating the diversity of people will prevent ad hoc and isolated solutions and also result in better planning, design and implementation of infrastructure project.
REFERENCES


APPENDICES
Questionnaire For Pedestrian
1. Are you a regular commuter?
2. In which area do you reside?
3. What is the approximate distance of your place from station?
4. When do you travel?
   4.1. Morning time
   4.2. Evening Time
5. How do you commute to and from station?
   5.1. Walk
   5.2. TMT Bus
   5.3. Auto-rickshaw
   5.4. Private Bus
   5.5. Personal Vehicle
6. How much time do you take for one -way journey?
7. If ‘walk’: Do you use sky walk?
   7.1. How often do you use?
8. If ‘not’ why do you avoid Sky walk?
   8.1. Not convenient (Height)
   8.2. walking on the road is preferred
   8.3. Notsafe
   8.4. encroached by hawkers
   8.5. It doesn’t make any difference in terms of time or comfort
9. Do you think criss-cross movement of modes is reduced due to SATIS?
10. In your opinion SATIS
    10.1. Has resolved prevailing mobility problems
    10.2. Not resolved prevailing mobility problems
    10.3. neither resolved nor augmented
11. If augmented, what are the problems created due to SATIS?
    11.1. More congestion
    11.2. Less road widths
    11.3. More air pollution
    11.4. More noise pollution

For IPT Operators
1. For how long are you working in this profession?
2. To which association do you belong?
3. What was the situation before SATIS?
4. What were the major problems before SATIS?
5. Were you or your association consulted before the project?
6. Do you think the problems have been addressed by SATIS?
   6.1. If yes, which problems?
   6.2. If no, why do you think they have been addressed?
7. What are the new problems?
8. What is your opinion about congestion?
9. What is your opinion about pollution?
10. According to you what went wrong in the project?

For Public Transport Operators
1. For how long are you working in this profession?
2. What was the situation before SATIS?
3. What were the major problems before SATIS?
4. How has SATIS been able to address those problems?
5. Are you satisfied with mode separation and prioritization?
6. What are existing problems?
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