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## ANALYZING PROPOSALS OF SMART CITIES UNDER PHASE – I

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**Abstract :** The drastic shift of Indian population into urban areas is encouraging citizens, city planners, businesses and governments to start having visions of Smart Cities. India is one of the rapidly developing country, it is making more and more growth in terms of socio – economic development giving boost to increasing economy of the country. Rapid migration and increasing population are putting more pressure on infrastructure and existing resources, so it was need for developing the cities and making it smart in all aspects. To deal with such arising problems of cities Government of India launched a Mission of smart cities for coping up with all infrastructure need and other demand of rapidly growing cities.

This thesis encloses the detailed analysis of the proposals of smart cities coming under phase – I from amongst ‘100 cities’ selected by the government of India, detail study of all social and demographic parameters, and also tries to find the relation between proposals and cost allotted for all verticals of selected smart cities.

**IndexTerms - Smart Cities, infrastructure, population.**

### I. INTRODUCTION

Urbanization has drastically increased over last few years and study show that people moving to urbanization is going to increase more & more. This increasing population in the cities poses numerous challenges in terms of both city governance and people’s lives. Cities are engines of growth for the economy of every nation, including India. Nearly 31% of India’s current population lives in urban areas and contributes 63% of India’s GDP (Census 2011). This requires comprehensive development of physical, institutional, social and economic infrastructure. All are important in improving the quality of life and attracting people and investments to the city, setting in motion a virtuous cycle of growth and development. Development of smart cities is a step in that direction.

#### 1.1 What is a ‘Smart City?’

The first question is what is meant by a ‘Smart City’. The answer is, there is no universally accepted definition of a Smart City. It means different things to different people. The conceptualization of smart city, therefore, varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents. A smart city would have a different connotation in India than, say, Europe. Even in India, there is no one way of defining a smart city.

Some definitional boundaries are required to guide cities in the Mission. In the imagination of any city dweller in India, the picture of a Smart City contains a wish list of infrastructure and services that describes his or her level of aspiration. To provide for the aspirations and needs of the citizens, Urban Planners ideally aim at developing the entire urban eco-system, which is represented by the four pillars of comprehensive development— Institutional, physical, social and economic infrastructure. This can be a long-term goal and cities can work towards developing such comprehensive infrastructure incrementally, adding on layers of ‘smartness’.

In the approach to the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of ‘Smart’ Solutions. The focus is on sustainable and inclusive development and the idea is to look at compact areas, create a replicable model, which will act like a lighthouse to other aspiring cities.

The Smart City Mission of the Government is a bold, new initiative. It is meant to set examples that can be replicated both within and outside the Smart City, catalyzing the creation of similar Smart Cities in various regions and parts of the country.

#### 1.2 Introduction of Title

As thesis includes study of all demographics of those cities coming under phase – I and later after selecting eight cities among them, the further detail study of all socio – economic parameters & its relevance in forming proposals is done. In this thesis I have gone

through a detailed study of all the demographics and further I have classified them in social parameters and economical parameters, also the details of budget allocation for smart cities and correlating it with annual budget is done.

### 1.3 Background Study

**Smart Cities Mission**, sometimes referred to as an urban renewal and retrofitting program by the Government of India with the mission to develop 100 cities across the country making them citizen friendly and sustainable. The Union Ministry of Urban Development is responsible for implementing the mission in collaboration with the state governments of the respective cities. Smart Cities Mission envisions developing an area within 100 cities in the country as model areas based on an area development plan, which is expected to have a rub-off effect on other parts of the city, and nearby cities and towns. Cities will be selected based on the Smart Cities challenge, where cities will compete in a countrywide competition to obtain the benefits from this mission. As of January 2018, 99 cities have been selected to be upgraded as part of the Smart Cities Mission after they defeated other cities in the challenge. The implementation of the mission at city level will be done by a Special Purpose Vehicle (SPV). Out of the 100 smart cities announced, as many as 94 Special Purpose Vehicles (SPV) have been established & 71 project management consultants have been appointed.

### 1.4 Aim

Analyzing the relationship between socio-economic parameters and its relevance in forming the proposals for smart city.

## II. RESEARCH METHODOLOGY

### 2.1 Process

Each aspiring city competes for selection as a Smart City in what is called a 'City Challenge'. There are two stages in the selection process. After the number has been indicated to the respective Chief Secretaries, the State/UT will undertake the following steps: -

#### Stage - 1 of competition: State-wise shortlisting of cities

The State/UT begins with short listing the potential smart cities on the basis of conditions precedent and scoring criteria and in accordance with the total number allocated to it. The first stage of the competition will be intra-state, in which cities in the state will compete on the conditions precedent and the scoring criteria laid-out. These conditions precedent have to be met by the potential cities to succeed in the first round of competition and the highest scoring potential smart cities will be shortlisted and recommended to participate in Stage - 2 of the challenge. The conditions precedent and the forms are given in the guidelines. The information sent by the ULBs in the forms has to be evaluated by the State Mission Director and the evaluation placed before the state-level High Powered Steering Committee (HPSC) for approval. The composition of the State HPSC is given in para-13 of the guidelines.

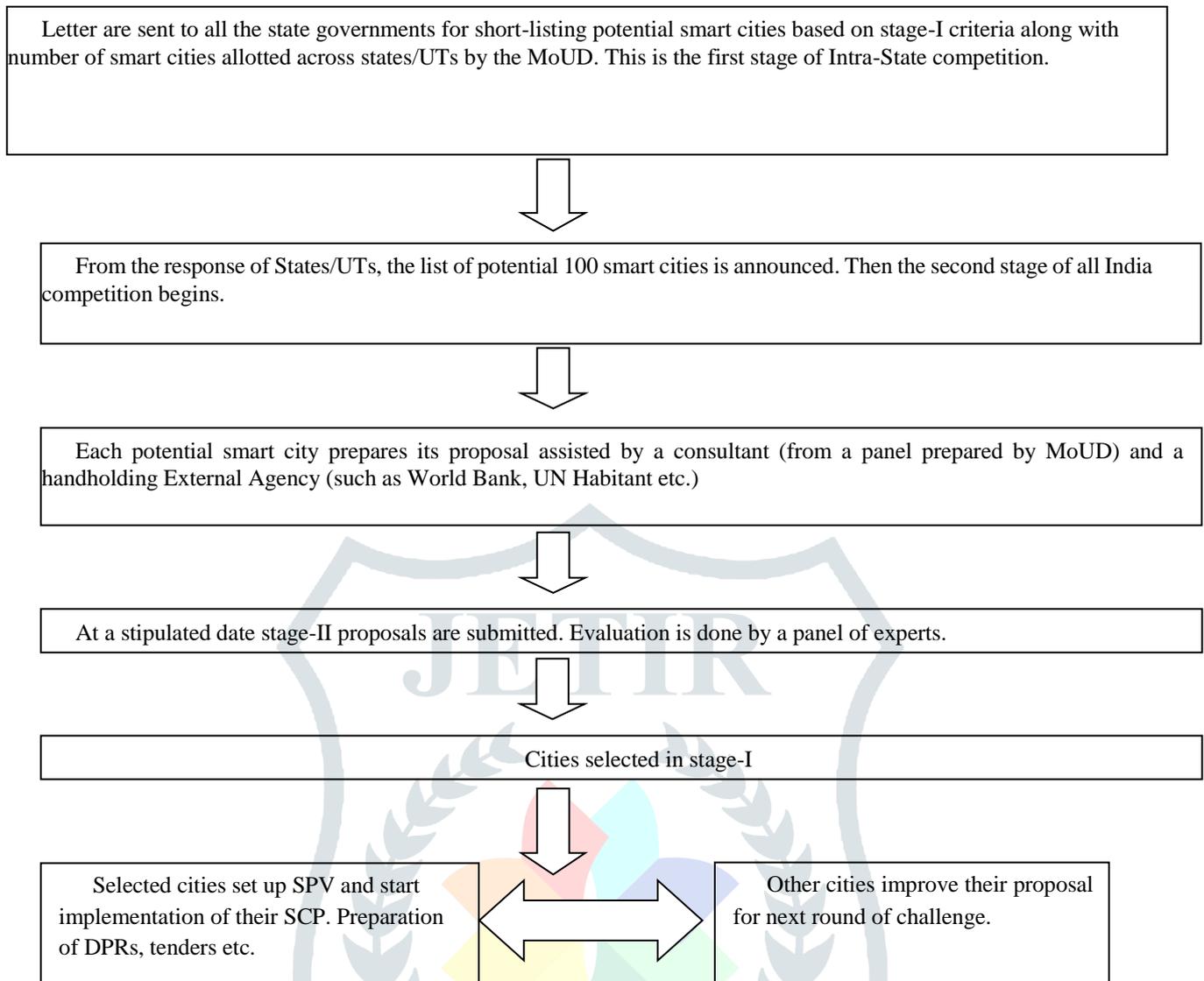
The cities emerging successful in the first round of competition will be sent by the State/UT as the recommended shortlist of smart cities to MoUD by the stipulated date (to be indicated in the letter to Chief Secretaries). The State Government has to fill the form (given in Annexure 3) and send with the recommended list. The MoUD will thereafter announce the list of 100 Smart Cities.

#### Stage - 2 of competition: Challenge for selection of cities

In the second stage of the competition, each of the potential 100 smart cities prepares their proposal for participation in the 'City Challenge'. This is a crucial stage as each city's Smart City Proposal (SCP) is expected to contain the model chosen, whether retrofitting, redevelopment, greenfield development, or a mix thereof, and additionally include a pan-city dimension with smart solutions. The SCP will also outline the consultations held with the city residents and other stakeholders, how the aspirations are matched with the vision contained in the SCP and importantly, what is the proposal for financing of the smart city plan including the revenue model to attract private participation. MoUD based on professional advice has worked out an evaluation criterion for the SCPs and this should act as guidance to the cities for preparing their proposal. The criteria and the documents to be sent with the application as per guidelines.

By a stipulated date, to be indicated by MoUD to the States/UTs, proposals will be submitted to MoUD for all these 100 cities. A Committee involving a panel of national and international experts, organizations and institutions will evaluate these. MoUD will announce the winners of the first round of challenge. Thereafter, while the winning cities start taking action on making their city smart, those who are not selected will start work on improving their SCPs for consideration in the second round. Depending on the nature of the SCPs and outcomes of the first round of the challenge, the MoUD may decide to provide handholding assistance to the potential smart cities to upgrade their proposals before starting the second phase.

### Steps for Selection of Smart Cities



**Figure 1:-** Steps for Selection of Smart Cities

#### Challenge Stage - 1:

Pre-conditions and documents to be submitted by each state Conditions precedent

1. State undertaking to make the City Smart (Form 1, Part-3)
2. Inter-departmental Task Force consisting of parasternal bodies, Urban Local Body (ULB), Organizations and Urban Development Authorities (UDAs) will be constituted in order to make the city smart (Form 1, Part-4)
3. Elected City Council's Resolution to make the city Smart (Form 2, Part-5)
4. Consultations held with residents on city development priorities (Form 2, Part-6)

#### Scoring Criteria

Below are given the scoring criteria to be used by the States/UTs to score the potential smart cities and send the names of cities with the highest scores to MoUD for their selection to participate in the Stage - 2 of the challenge.

#### 1. Existing Service Levels

- 1.1. Percentage of increase over Census 2011 or Swachh Bharat baseline on number of household sanitary latrines, whichever is less (Form 2, Part -1) – **10 points**
- 1.2. Making operable Online Grievance Redressal System with response being sent back to complainant (Form 2, Part-2) – (Y/N) – **5 points**
- 1.3. At- least first monthly e- newsletter published (Form 2, Part-3) – (Y/N) – **5 point**
- 1.4. Electronically place project-wise municipal budget expenditure information for the last two financial years on the website (Form 2, Part-4) – (Y/N) – **5 points**

#### 2. Institutional System/Capacities

- 2.1. Started to levy compensatory penalty for delays in service delivery (Form 2, Part 7) - (Y/N) – 5 points

2.2. Total collection of internally generated revenue (e.g. taxes, fees, charges) shown an increasing trend during the last three FYs (2012-15) – (Form 2, Part 8) (Y/N) – 10 points

Self-Financing

1. Payment of salaries by ULB up-to last month (Form 2, Part-9) – **5 points**
2. Audit of accounts up-to FY 12-13 (Form 2, Part-10) – **5 points**
3. Percentage contribution of tax revenue, fees and user charges, rents and other internal revenue sources to the ULB Budget (actuals in 2014-15) – (Form 2, Part 11) – **10 points**
4. Percentage of establishment and maintenance cost of water supply, which is met by collected user charges for supply of water during last FY (2014-15) – (Form 2, Part 12) – **10 points** past track record and reforms
5. Percentage of internal revenue sources (self- generated) budget funds used for capital works during FY (2014-15) – (Form 2, Part 13) – **10 points**
6. Percentage of City- level JnNURM Reforms achieved (Form2, Part 14) – **10 points** for six (6) ULB level reforms
7. Percentage of JnNURM projects completed, which were sanctioned during the original Mission period (up to 2012) (Form 2, Part 15) – **10 points**

### III. RESULTS AND DISCUSSION

#### Budget Allocation

The budget allocation section discusses that Annual budget of all cities is more than that of Smart City Budget else than that for Surat smart city whose smart city budget is more than that of annual budget. The highest annual budget is for Ahmedabad (6551 Cr) and Lowest for Ludhiana (1316 Cr). The highest smart city budget is for Jabalpur (3808.09 Cr) and Lowest for Ludhiana (1061 Cr).

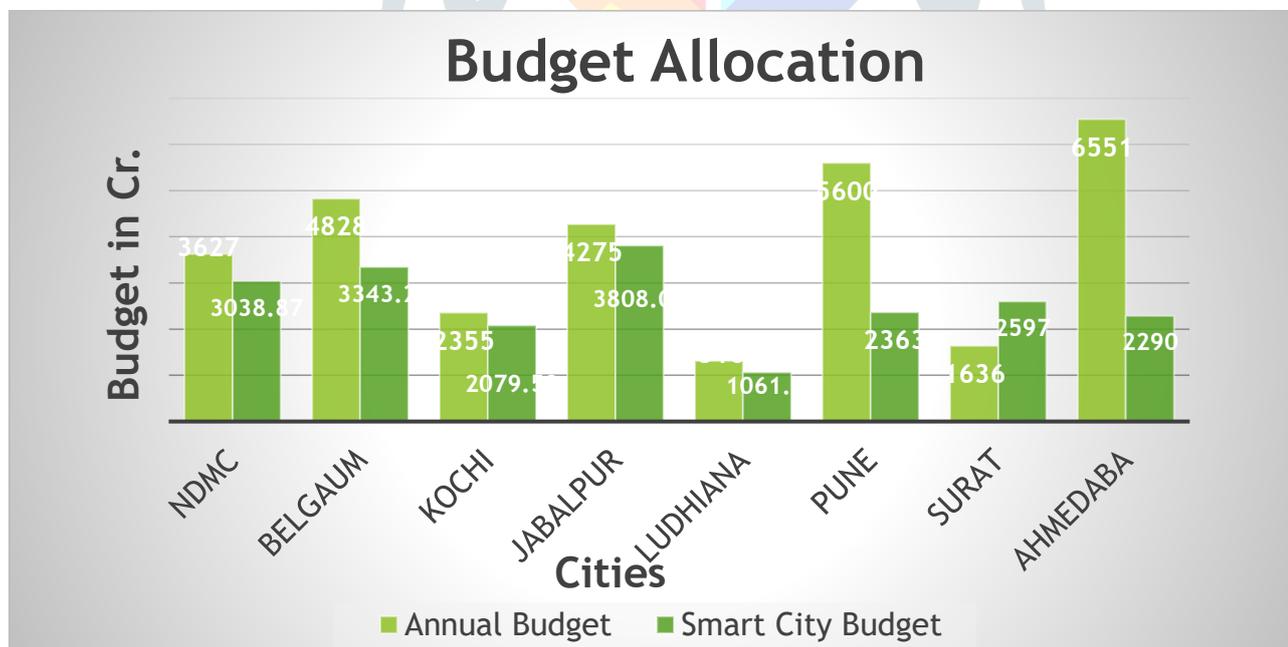


Figure 2:- Budget Allocation Graph

Graphical Representation of Budget along with Demographic Data

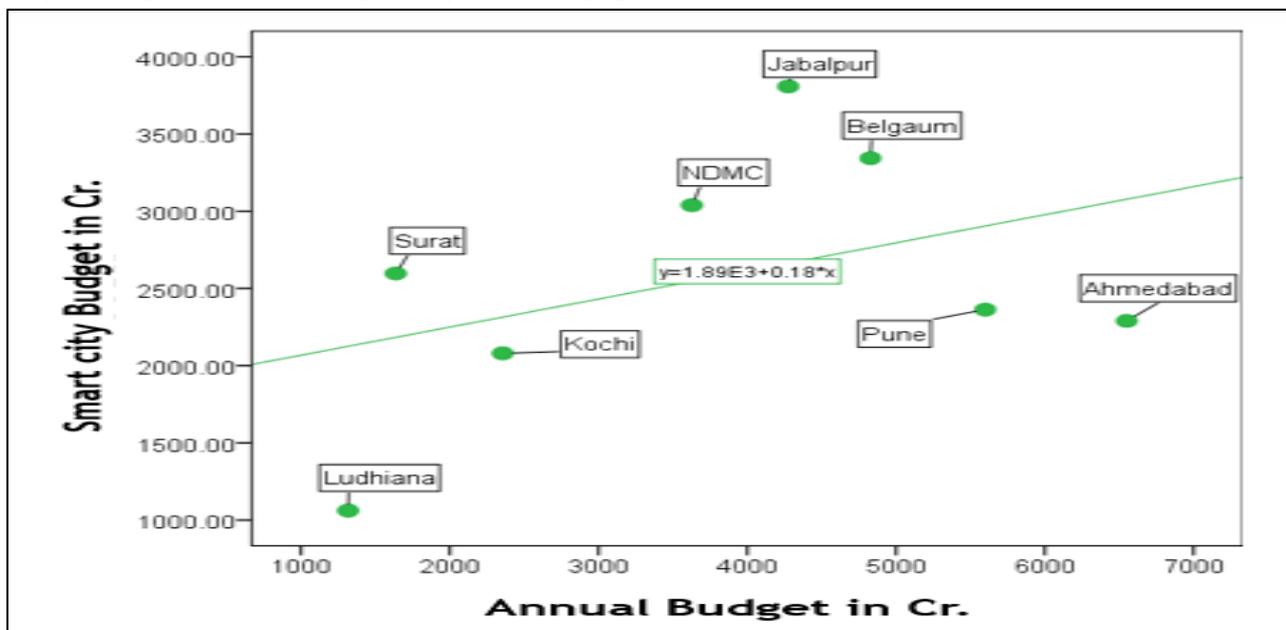


Figure 3:- Smart City Budget vs Annual Budget

The positive correlation shows that higher the smart city budget higher is annual budget of the cities. But cities such as Surat, Jabalpur, NDMC have lower annual budget than Pune, Kochi, etc. but has higher smart city budget allocation.

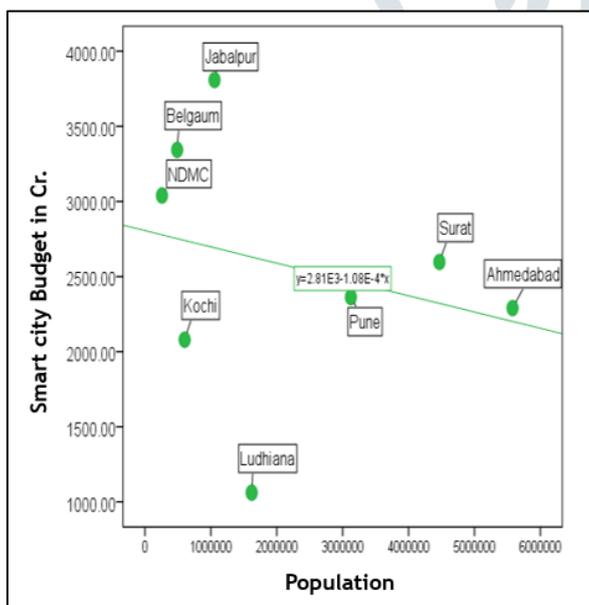


Figure 4:- Graph of SCB vs Population

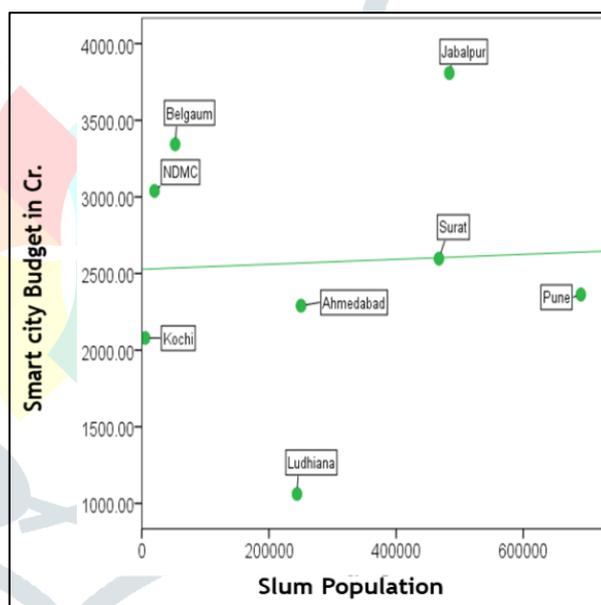


Figure 5:- Graph of SCB vs Slum Population

- There is negative relationship between population and smart city budget.
- Size of population has no effect on smart city proposal budget.
- The positive relation is observed between slum population and proposal of retrofitting budget.
- Retrofitting costs is observed to be higher in cities where the slum population is more.

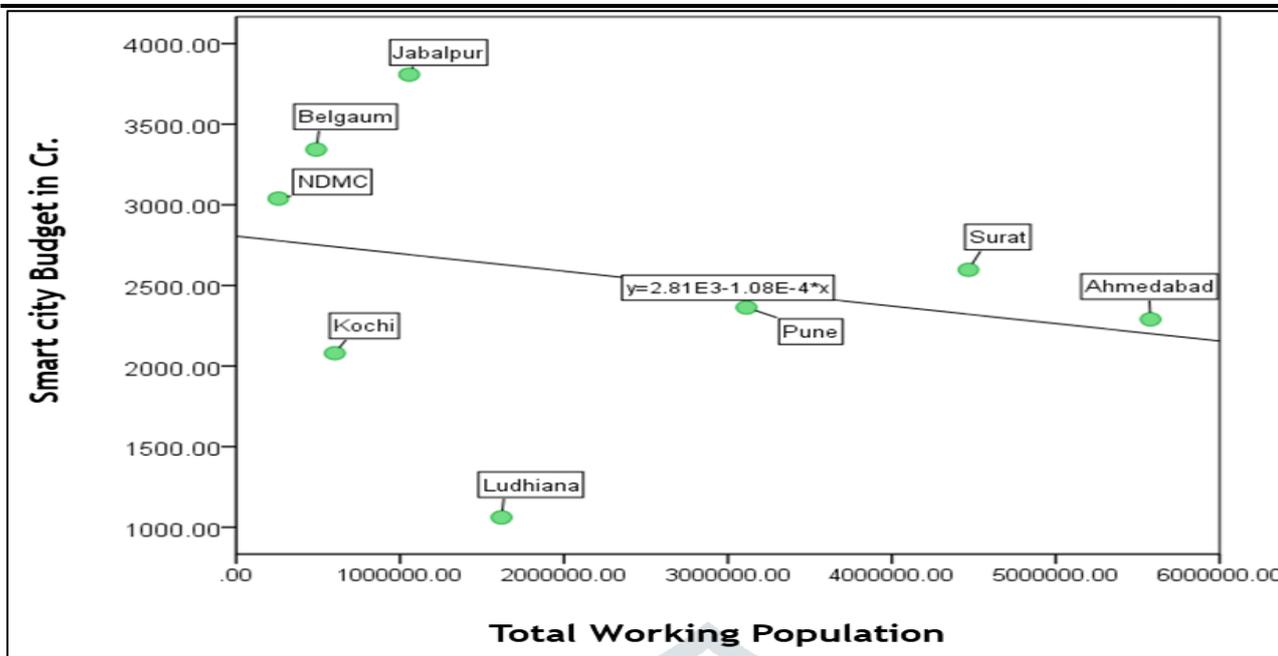


Figure 6:- Graph of SCB vs Total Working Capital

- The negative relation is observed between work population and smart city proposal Costs.
- Higher the working population lower is the Smart city budget costs.
- Cities such as NDMC, Jabalpur, Belgaum have higher Smart city budget allocation inspite of their lower total working Population as compared to other cities.

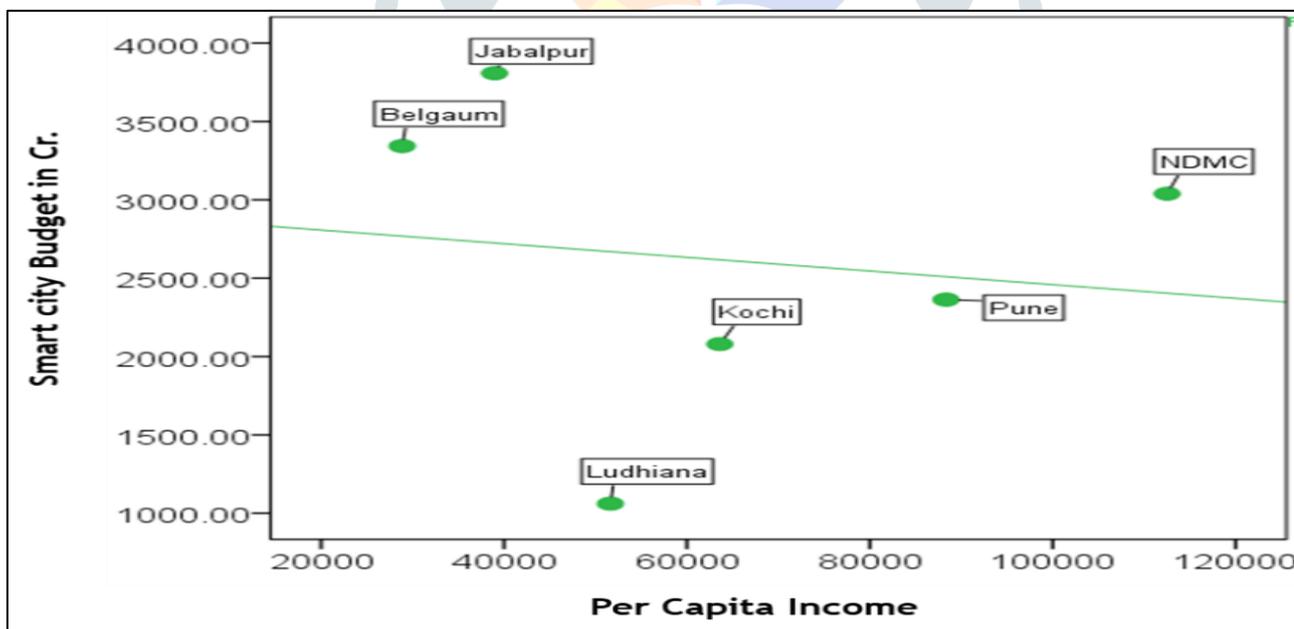


Figure 7:- Graph of SCB vs Per Capita Income

- There is negative relation between smart city budget and per capita income.
- Higher per capita income lowers the smart city budget allocation.

Graphical Representation of Retrofitting along with SCB and Demographic Data

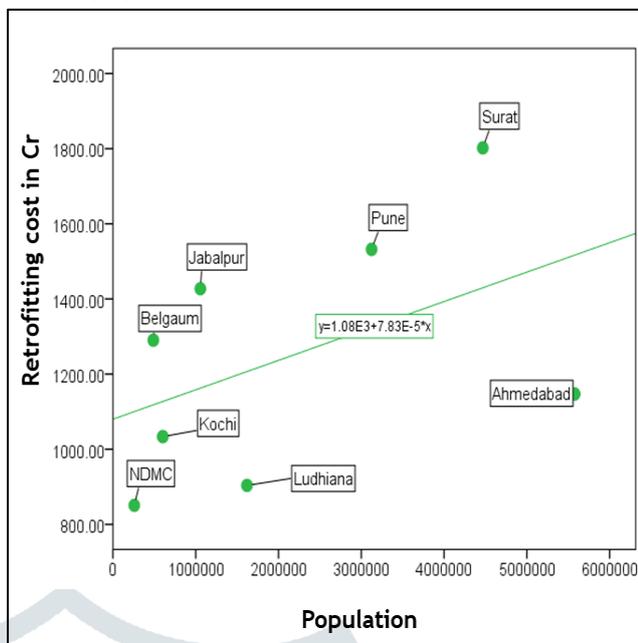
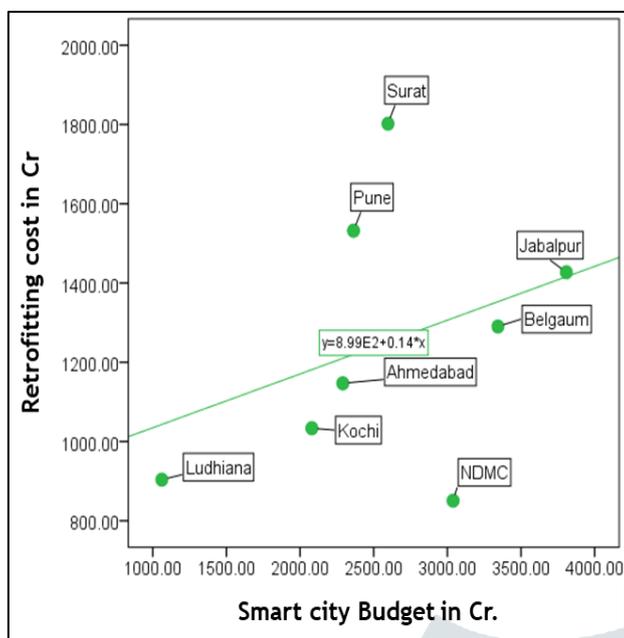


Figure 8:- Graph of Retrofitting vs SCB

Figure 9:- Graph of Retrofitting vs Population

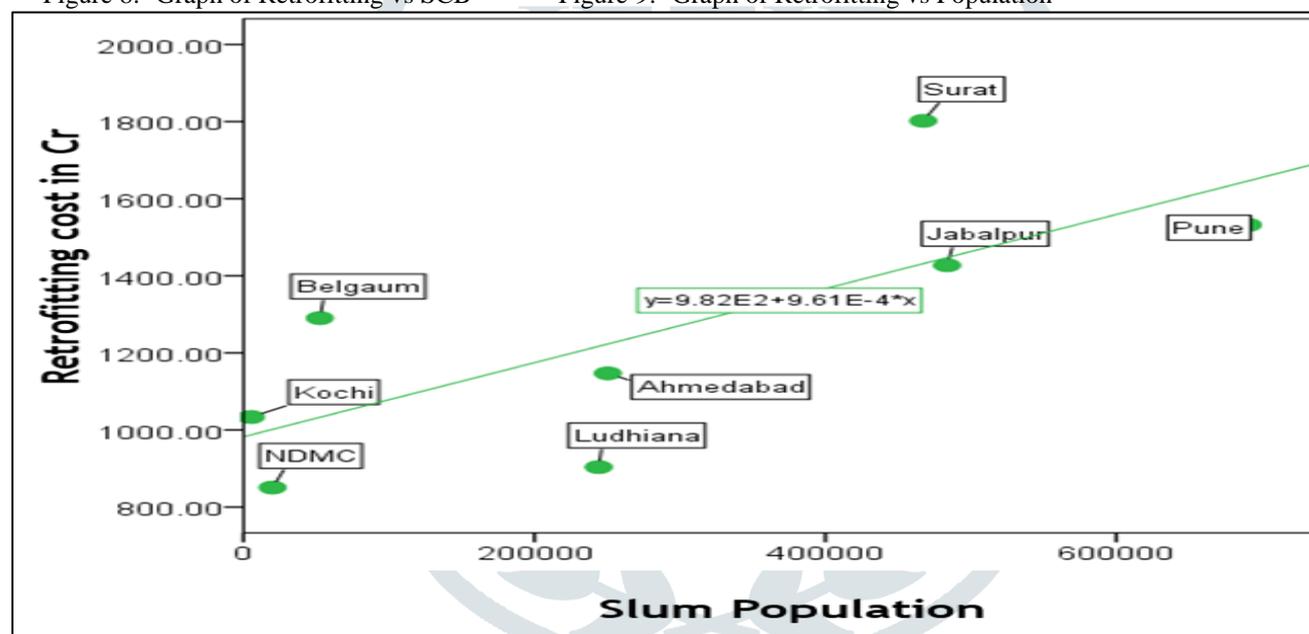


Figure 10:- Graph of Retrofitting vs Slum Population

- The steep upward slope shows that retrofitting costs are higher with the cities having high smart city budgets this is because the slum population of the cities are higher.
- In cities such as Jabalpur and Pune, proportion of the slum population from overall population is high and hence the retrofitting costs are higher in these cities.
- Whereas in NDMC and Kochi, retrofitting cost is observed to be lower as compared to other cities because of the low slum population.

Graphical Representation of Pan City Development along with SCB and Demographic Data

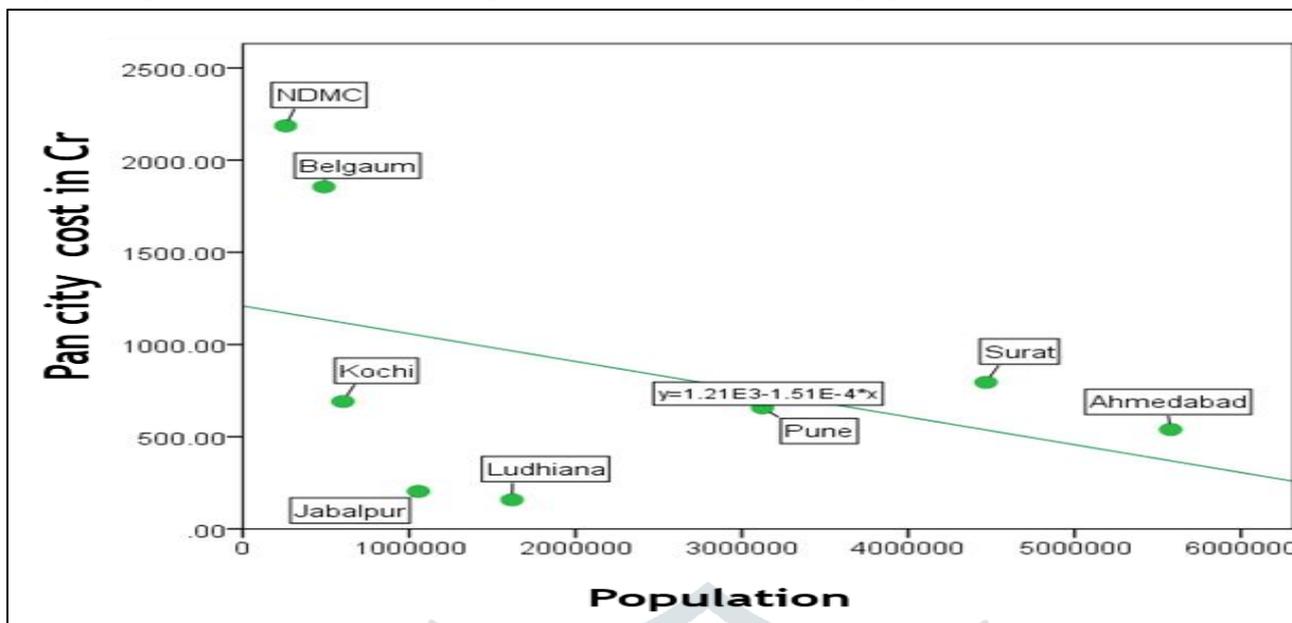


Figure 11:- Graph of Pan City vs Population

The negative relation between Population and Pan city Proposal Budget is seen. The steep downward slope is observed which shows that higher population lowers the Pan city costs, this is because of lower smart city budget allocation. But in cities such as NDMC and Belgaum, Pan city costs are higher inspite of their lower population.

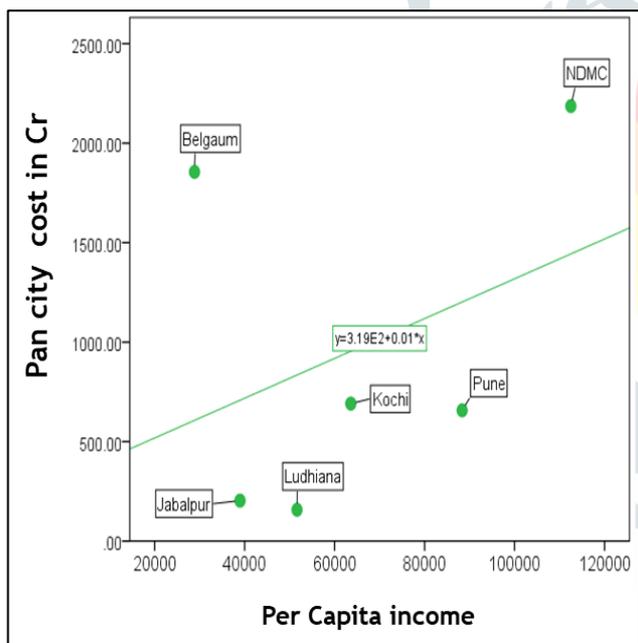


Figure 12:- Graph of PCD vs Per Capita Income

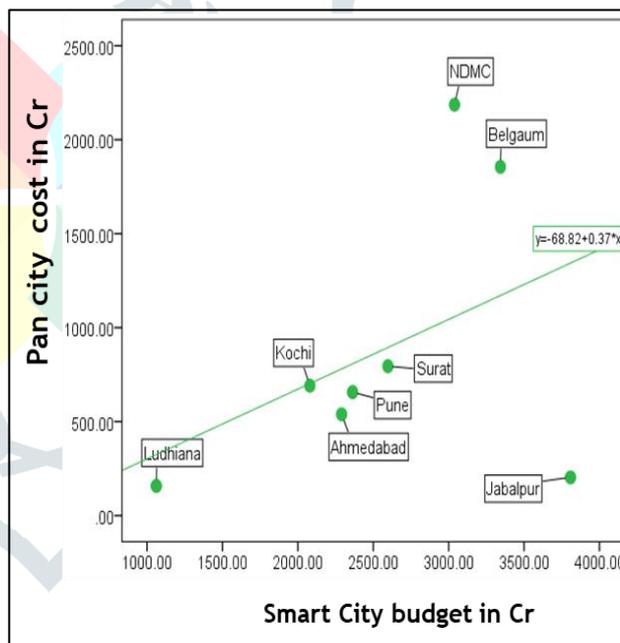


Figure 13:- Graph of PCD vs SCB

The upward sloped which shows that higher the per capita income, higher the pan city cost. Higher smart city budget allocation, higher is the Pan City Development cost allotted.

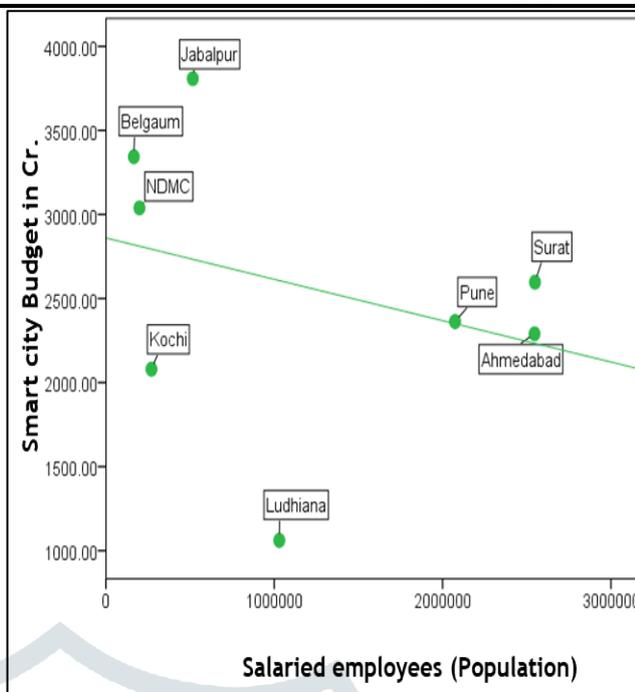
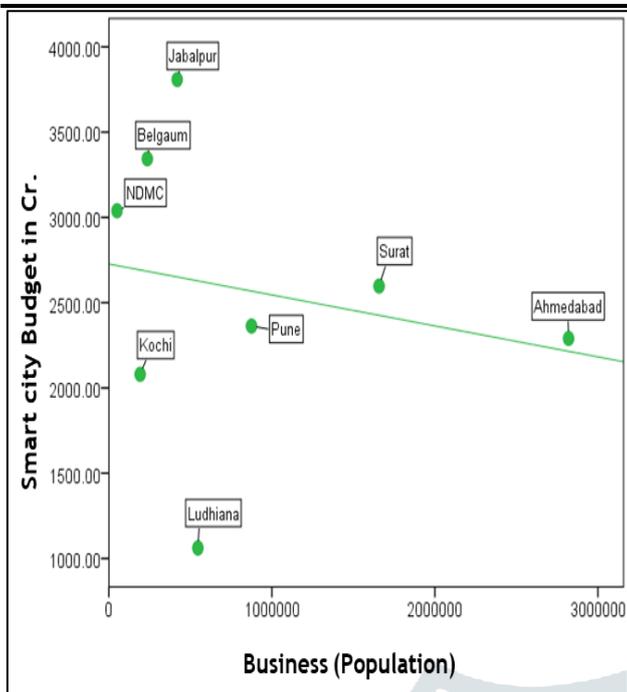


Figure 14:- Graph of SBC vs Business

Figure 15:- Graph of SBC vs Salaried Employees

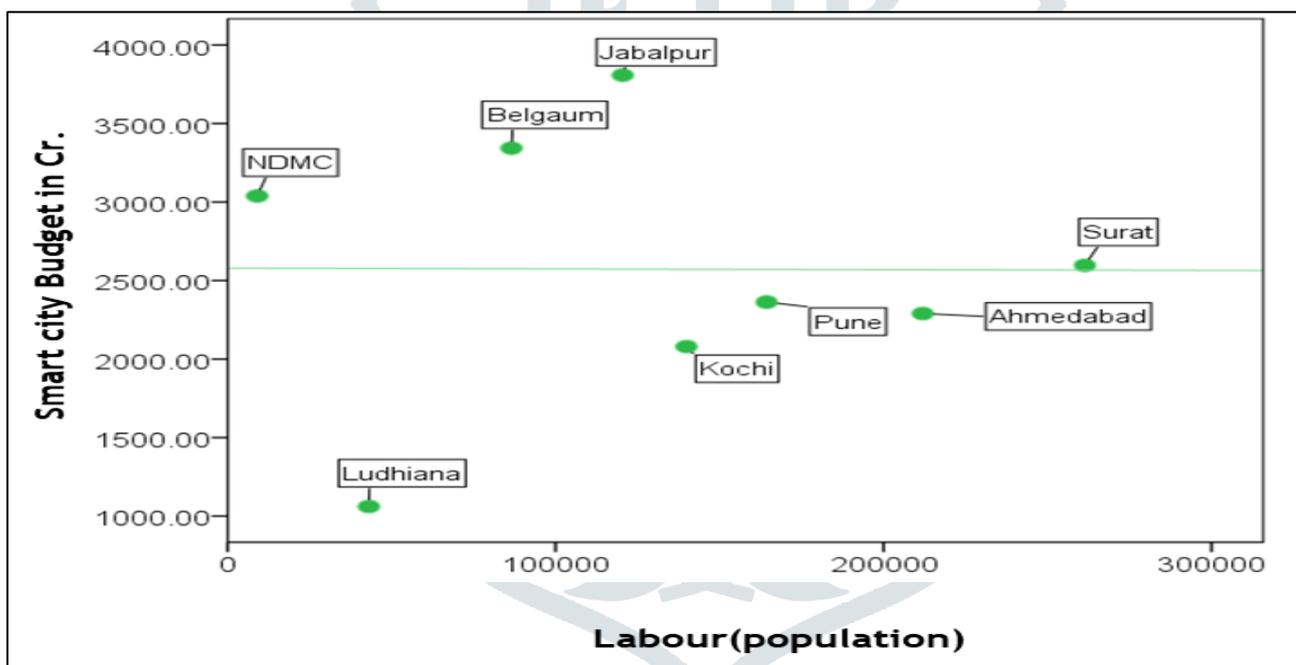


Figure 16:- Graph of SCB vs Labour

The graph shows the effect of occupational pattern in budget allocation. It is observed that the population involved in business increases, budget allocation is decreasing and similar is observed in case of salaried employees, whereas budget allocation is not much influenced by labour population.

Graphical Representation of Pan City Cost and Occupational Pattern

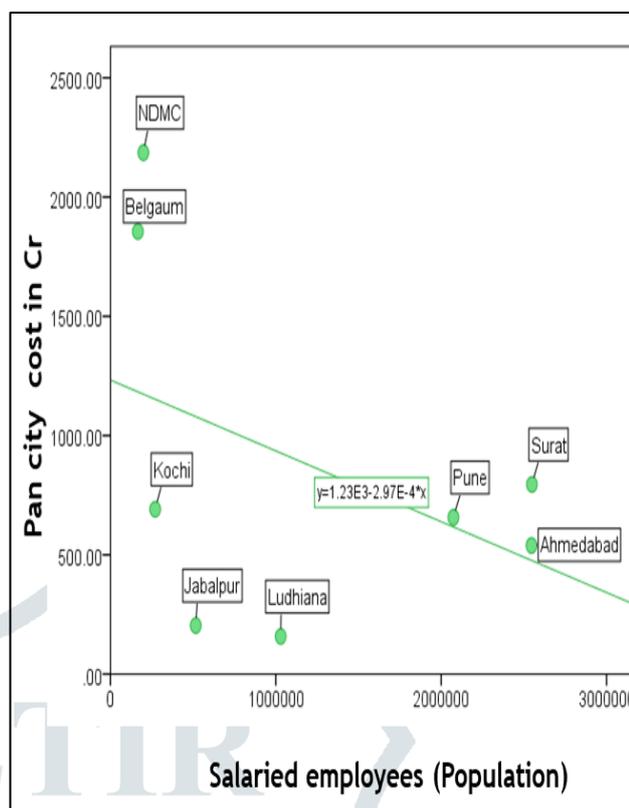
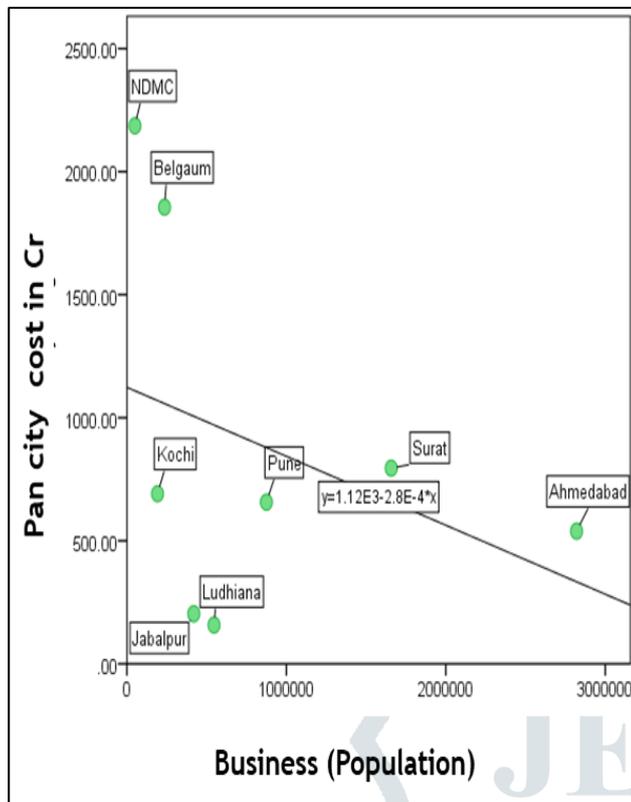


Figure 17:- Graph of PCC vs Business

Figure 18:- Graph of PCC vs Salaried Employees

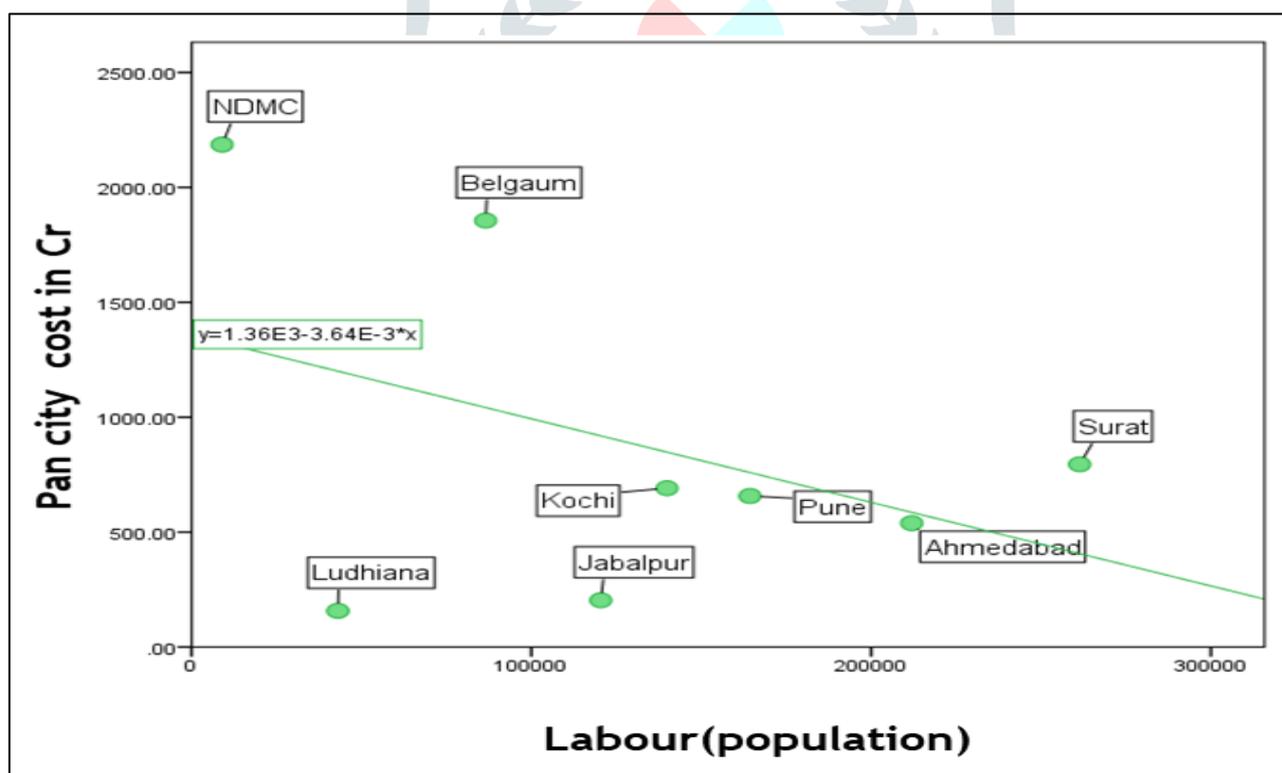


Figure 19:- Graph of PCC vs Labour

- The graph shows the effect of occupational pattern in Pan City cost allocation.
- The negative relation is observed in working population in Business, Salaried employee, and Labour population with Pan city Proposal Costs.
- The steep slope shows that, higher the population involved in business, lower is the Pan city budget allocation and similar is observed in case of salaried employees, labour population.

**Equation of Overall Regression**

Table 1:- List of Variables used for Regression

Sr. No.	Variables	Beta Co-efficient	P value Sig.
1	(Constant)	6143.360	.004
2	Population	2.5	.044
3	Annual Budget	9.1	.008
4	Slum population	9.17	.005
5	Working Population	1.46	.035
6	Density	2.3	.059

If P-Significance value is less 0.05 then the independent variable is considered to be significant variable and has a significant impact on the dependent variable. All the independent variables have significant impact on the smart city budget described by the following Equation.

Smart City Budget is dependent Variable (Y) whereas others are independent Variable.

$$Y = 6143.360 + 2.5 * \text{Population} + 9.1 * \text{Annual budget} + 9.17 \text{ Slum Population} + 1.46 * \text{working Population} + 2.3 * \text{Density}$$

**IV. ACKNOWLEDGMENT**

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