



## A Comparative Study of Change in Built Environment and Human Behavior in Siruseri

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**Abstract:** This study has been undertaken to investigate the relationships between human behavior and built environment changes in Siruseri, India. The land acquisition by government for development of SIPCOT (State Industries Promotion Corporation of Tamil Nadu Ltd.), IT Park in Siruseri has been the major reason for its drastic development in a short period of time. The land covered by the SIPCOT IT Park and the native settlement have seen an unbalanced development. The unsurpassed development of SIPCOT IT Park has taken a toll on the native settlement, causing behavioral changes in both regions. The employees of SIPCOT IT Park have also undergone behavioral changes, as a reaction to the new built environment. Mapping of built environment changes and its effect on human behavior and quality of life through observation walks and questionnaire studies were conducted at the SIPCOT area and the surrounding settlements of Siruseri, to analyze and explore the interconnectivity and interdependency of each other. These observations, when studied carefully provide evidences of a reduction in the quality of life of users of Siruseri as opposed to the general belief that development enhances the quality of life

**Index Terms – Built environment, human behavior, quality of life.**

### I. INTRODUCTION

The approaches of design for behavior change acknowledge that built environment have an important influence on human behavior and/or behavioral decisions. This is evidently seen and acknowledged by the people of Siruseri and the floating population of SIPCOT employees through the drastic development measures that have been happening in the past 2 decades. Many observations by the users make an unconscious comparison of the built environment and human behavior.

Generally, Architects, designers of environment and landscape, and urban designers use physical environment for referring non-social and non-cultural aspects of environment. But definition of the buildings should be comprehensive, inclusive of open interactive spaces, user experience and opportunistic physical activities to promote health and good quality of life. It should be understood that the built environment has a potential power to meet man's experiences and behaviors.

Hence this research intends to explore this potential of built environment in Siruseri. Any space with rapid built environment changes in a short period of time would result in a measurable change in human behavior. This fact has led to the selection of the study site, where change has been evident.

### II. RESEARCH METHODOLOGY

- Siruseri Village Panchayat is selected as the site, which includes the SIPCOT IT Park area and native settlements, along with a sensitive ecological landscape.
- Observational walks were conducted throughout the site, to understand and navigate the built environment. And to have an overall understanding of the nuances of the site and its present users. A picture of the relationships between the user and the built environment is mentally mapped along with the differences between the SIPCOT IT Park area and surrounding settlements.
- Secondary data sourcing were done through the media and government offices to improve the understanding and to collate with the observational outcomes. Older maps were collected to understand the growth and development changes in Siruseri.
- The secondary data collected was used to prepare questionnaire, to understand the thought process, the experiences and the orientations of the users of Siruseri. Two different questionnaires were prepared considering the different environments and user groups of SIPCOT IT Park and surrounding settlements. This study is documented as the primary data and is used to understand the earlier built environment, the change in human behavior and current challenges faced by the users.
- All the data collected is tabulated and analyzed to come up with a holistic approach to relate change in built environment and human behavior.

### III. SITE DETAILS

Siruseri is a locality in Muttukadu village. Muttukadu is located south east of Chennai, in Chengalpattu district, Tamil Nadu, India, around 25 km south of the city centre, along Old Mahabalipuram Road. It is located between Navalur and Kelambakkam. Siruseri is after the end of the IT Corridor of Chennai along Old Mahabalipuram Road.

Siruseri is home to the SIPCOT IT Park, a technology park. State Industries Promotion Corporation of Tamil Nadu Ltd., SIPCOT, has developed an Information Technology Park in 1,000 acres (4 km<sup>2</sup>) of land at Siruseri Village. The IT park is the largest IT park in South India, in the Cyber Corridor for allotment of land to IT Companies, who wish to build their own campuses. This park proposes to have all basic infrastructure facilities like separate Sub-Station for power supply, separate telephone exchange and High Speed Data Connectivity. The areas in and around Siruseri have seen unprecedented growth in the last few years. These new infrastructure serves the requirements of the IT/ITeS professional working in SIPCOT IT PARK.

The Siruseri native settlement, which is just behind the IT park has a distinctly unique natural setting surrounded by water bodies. This settlement which is nestled between the two eris(manmade water bodies), before the inception of the IT Park was once an agricultural village. Figure 1 depicts the location of Siruseri in Tamil Nadu and the distribution of landuses within Siruseri.



Figure 1 Siruseri Site Location

### IV. BUILT ENVIRONMENT AND CHANGE IN HUMAN BEHAVIOR ANALYSIS

Siruseri, with time has become a unique region with prominent visual differences within a distance of 3KM. The SIPCOT IT Park region shows a good infrastructure comparable to a developed city while the nearby native settlement still has a village appearance with poor development. Both these regions have undergone changes in built environment in the last 2 decade at the cost of ecology of the region. The resultant human behavior changes due to change in physical, social and psychological setting are attempted to be studied among the users of Siruseri.

#### 4.1 Ecological changes caused by change in built environment

The Chennai city's hydrology is vitally supplemented by the Aquifer Recharge Zone, which restores groundwater levels through rainfall. Siruseri is exactly present at this aquifer recharge zone. The Siruseri IT Park, being an ambitious development project was officially launched in 2008 and saw droves of real estate developers and IT companies flock to the region to profit from what was envisioned to be the city's new centre of business. The uncontrolled growth as evident in the Figure 2, led to extensive overuse and pollution of the marshland and other water bodies in the region.

The tentacle-like formation in Siruseri in Fig. 2 is a sandy recharge zone where waters from three directions (North, West and South) converge to run east to join the backwaters stretching down to the Kovalam estuary. This natural formation is critical for groundwater recharge in the region. However, this has now been paved over to set up the Siruseri IT Park.





Figure 2 Siruseri IT Park Satellite image in 2002 and 2018

#### 4.2 Human Behavior in IT Park, Siruseri

Major IT companies like Tata Consultancy Services (TCS) and Polaris with many others are present in 1000 acres land of SIPCOT IT Park, Siruseri. While TCS has taken 70 acres, Polaris has taken 13 acres and Xansa Ltd has taken nearly 27 acres of land in the park for their development centers. Some of the second-rung IT companies have also bought land in the park for their offices. Other IT companies like Microsoft and Infosys have also evinced keen interest in setting up their development centers in the park. Figure 3 shows the posh views of the IT park with modern buildings.

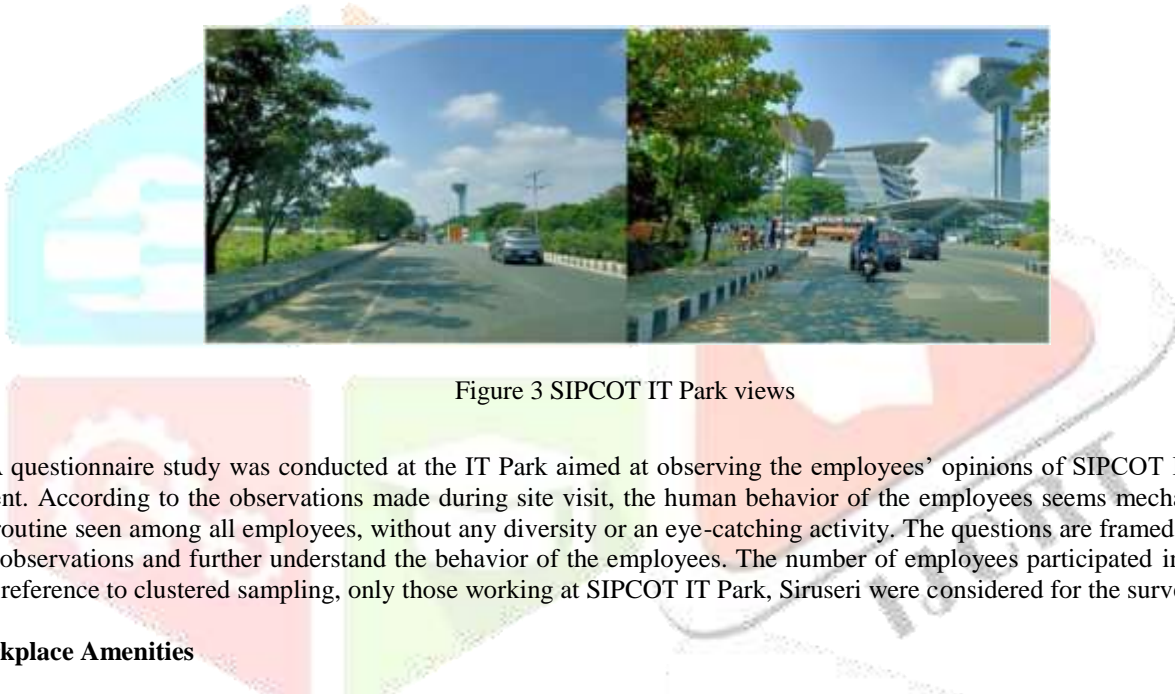


Figure 3 SIPCOT IT Park views

A questionnaire study was conducted at the IT Park aimed at observing the employees’ opinions of SIPCOT IT Park as a built environment. According to the observations made during site visit, the human behavior of the employees seems mechanical. There is a mundane routine seen among all employees, without any diversity or an eye-catching activity. The questions are framed in order to check the above observations and further understand the behavior of the employees. The number of employees participated in the survey were 100. With reference to clustered sampling, only those working at SIPCOT IT Park, Siruseri were considered for the survey.

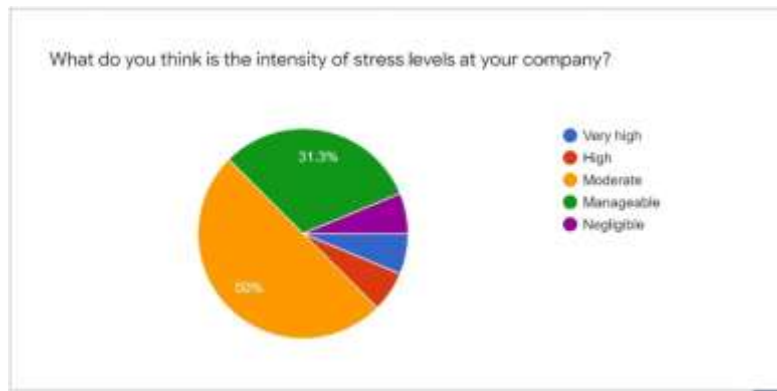
#### 4.2.1 Workplace Amenities



Graph 1 Workplace Amenities

**Interpretation:** Basic amenities like restaurant/canteen and first aid clinic are present in all companies, but refreshing or rejuvenating spaces are less. Whereas these are the spaces that help the employees relieve stress and be productive at work. These spaces are the backbone of healthy work environment.

### 4.2.2 Workplace Stress



Graph 2 Workplace stress

**Interpretation:** More than 50% of employees (68.7%) have marked that they face moderate to very high stress levels. Absence of refreshing and rejuvenating spaces might be the reason for not reducing the stress levels faced by employees during work.

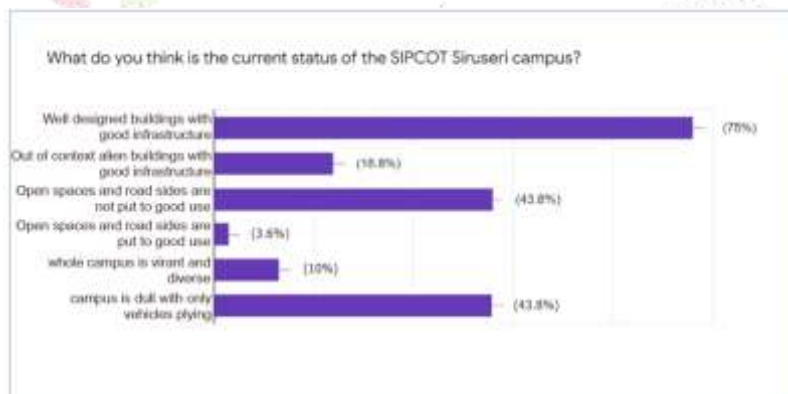
### 4.2.3 Workplace Stress Busters



Graph 3 Workplace stress busters

**Interpretation:** Many companies have common gathering spaces and also encourage team building exercises and cultural activities outside the company at most once a month. But what these companies may lack is specific designated relaxing spaces within the company or at any nearby accessible space.

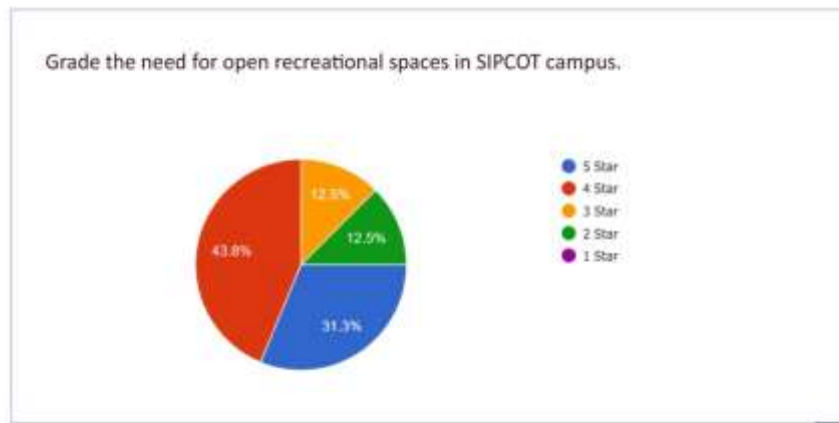
### 4.2.4 User Opinions about the campus



Graph 4 User opinions about the campus

**Interpretation:** Maximum percentages of employees feel that the SIPCOT IT Park, Siruseri campus has well designed buildings with good infrastructure, but general comments of conservative Architects on the typical design of IT Parks in India, say that they are of alien nature without any consideration to surrounding context. The comments of open spaces and the road sides, shows the desperation of the employees to have an active environment surrounding their work place.

#### 4.2.5 Need for Recreational Spaces



Graph 5 Need for open recreational spaces

**Interpretation:** No participant had opted for the least probability of 1 star, showing no one had intentions to not have such spaces. 75.1% of participants opted for high probability of visit showing that everybody wanted to have a different environment apart from their work place. These spaces might also help the employees take a break from their movements and make the campus vibrant.

#### 4.3 Change in character of the Native Settlement, Siruseri – Micro Study

The Siruseri village native settlement is nestled between two eris (manmade water bodies), namely Periya eri and Sitteri, as depicted in Figure 4. The eri system serves to control floods, prevent soil erosion, reduce wastage of runoff during heavy rainfall, and also recharge groundwater aquifers. Irrigation channels from the eris enable paddy cultivation which otherwise would have been almost impossible in most parts of Tamil Nadu owing to a relatively flat terrain.

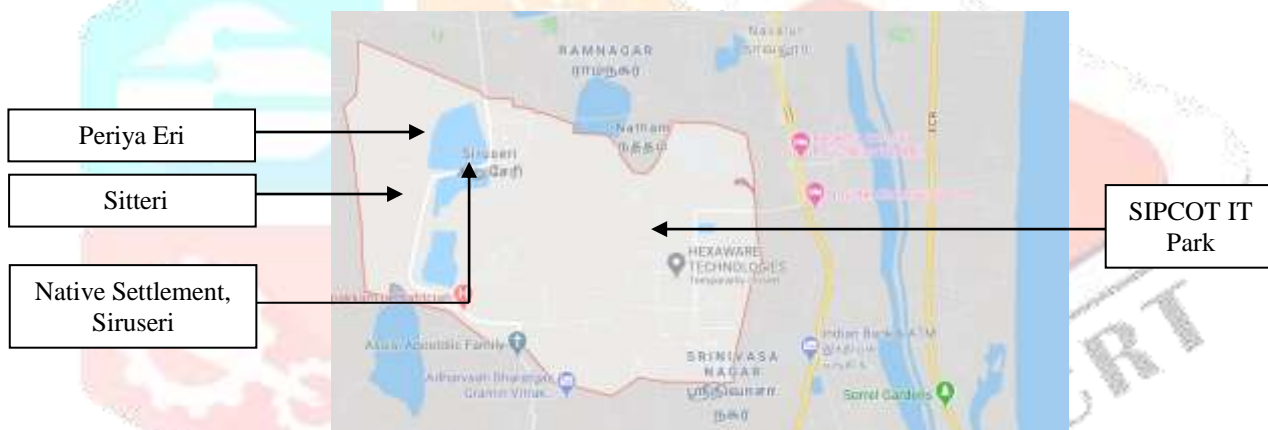


Figure 4 Location of native settlement near the water bodies

##### 4.3.1 Earl Livelihood of Siruseri

Traditionally, the eri system is designed to hold rainwater in one place and allow for surplus to flow to the next one. This also ensures that other settlements can thrive around the eri through agriculture as is the case with Siruseri too. As quoted the villagers during discussions, besides the eri's role in nurturing the livelihoods of the villages, native residents were also celebrating various festivals along the banks of the eri. Even a decade ago, Siruser's youth were enjoying a refreshing swim in the eris, on a daily basis women cooked with the water from the eri and men went fishing for various native species of fish. Essentially in the late 90s, these eris were the socio-cultural and socio economic lifeline of this primarily agrarian settlement. But then it all changed with the inception of the IT Park.

##### 4.3.2 Changes bought by Inception of the IT Park

In the 90s, the land between the Sirusen village settlement and Old Mahaballipuram Road came to be developed as the special economic zone (SEZ) known better as SIPCOT IT Park as part of the proposal to establish an IT Corridor along this axis. This prompted many landowners to give up farming, sell their lands to SIPCOT and migrate to other neighborhoods. Since traditional farming farmland practice was mostly feudal, it meant that with the sale of for non-agricultural purposes, many others lost their livelihoods. The less or non-existent opportunities for developing other skills led to a steady decline in prosperity among the residents of Siruseri and adjoining villages.

The development of SIPCOT came with the promise of low skill jobs for the villagers; it also started to draw on the water of the region. Water from the eris which was used until then for farming became surplus and were now being given to SIPCOT. After this point, the eri began to be accessed by the villagers only for leisure very infrequently, the lack of agricultural work in the village meant that villagers now needed to travel to other places for work. As commute times increased, time for leisure decreased, with no agriculture in the villages, harvest festivals too lost their relevance. This decline in patronage further Induced a vicious cycle wherein the only people who now frequent the eri are men folk either to drink alcohol or to defecate. Eventually, over time, the eris themselves lost their pride of place



among the villagers. At present the native settlement is a yet another underdeveloped suburb with poor quality of life, with almost half the settlement being populated with migrants as natives had to leave in search of job.

## V. RESULTS AND DISCUSSION

The Siruseri area was studied and it was found that there were 2 types of development happening:

- First zone being the SIPCOT IT Park area and the new settlement/gated communities coming up as result of the real estate boom due to the IT Park. Here the development has been unprecedented and numerous IT companies have come up within a span of 10 years, employing 1000s of people.
- Second zone is the native settlement. This space has been deprived of the basic necessities and snatched off their livelihood.

All these drastic change in built environment has led to change in human behavior in different scales in each zone.

### 5.1 Zone 1- IT Park campus, Siruseri

- Apart from few major league companies like TCS and CTS, the employees of other companies face meager social infrastructure.
- The campus itself has inadequate social interactive spaces. The to and fro travel period of the employees seem to be rigid and monotonous.
- The built Architecture is the only dominant feature of the IT Park and the aspects of neighborhood, society and ecology have been submissive.
- The absence of a sense of place, eagerness to have a social life and a breathing space is evident in this community.
- This zone shows evidences that having a good infrastructure are not always enough for a good quality of life. Good quality of life is possible only when infrastructure takes the social needs of its users into account.

### 5.2 Zone 2 - Native settlement

- They have lost the once nature hugged livelihood in a fast pace to development.
- The once human and ecology friendly built environment carefully constructed by the native people is transformed by the land use changes.
- They have not been reimbursed in anyway. The basic necessities, the social needs and a way to reconnect back to nature are their needs, which may easily help their human behavior and quality of life change for better.

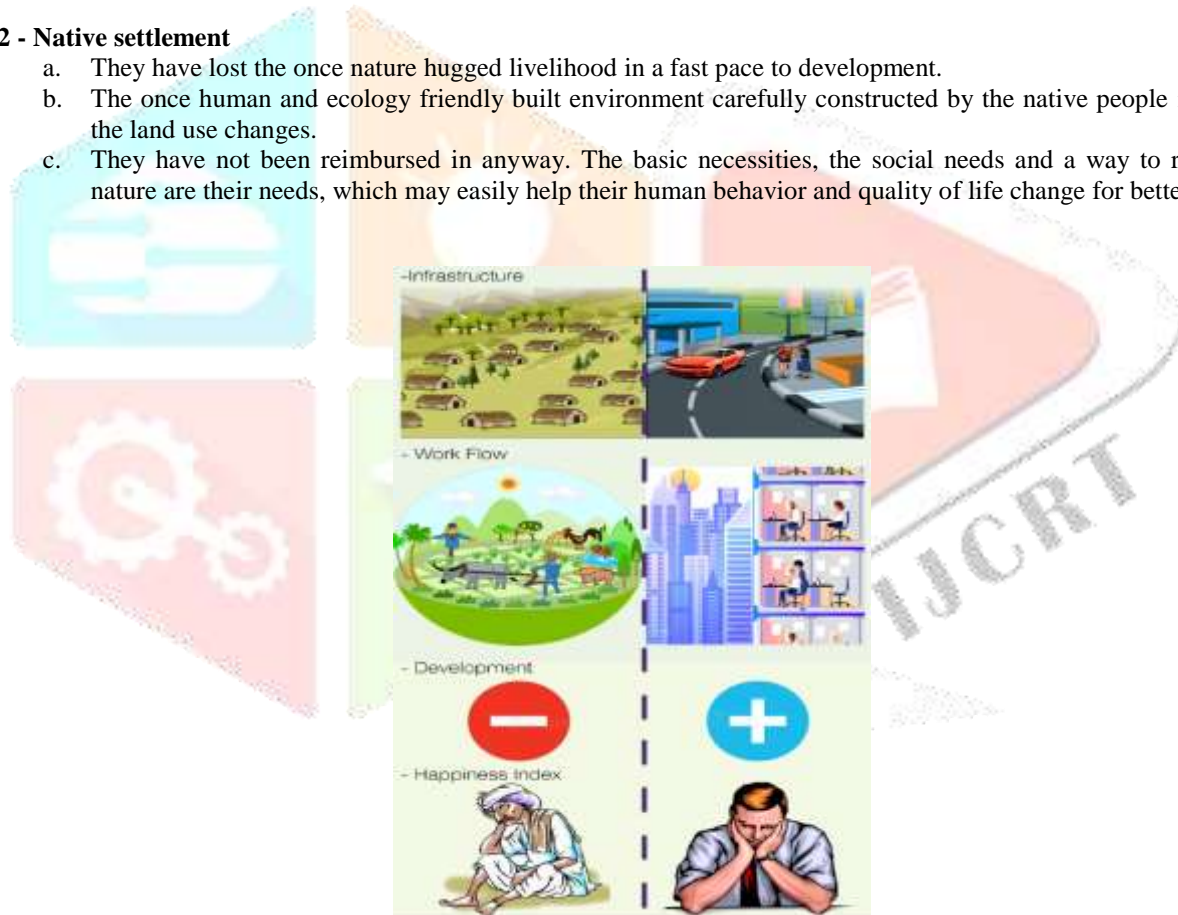


Figure 5 Illustration of the observation at Zone 1 and Zone 2

## Acknowledgment

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