

REDESIGNING THE IDENTITY OF SIVAKASI-ESTABLISHING LEGITIMACY AND DIGNITY THROUGH ARCHITECTURE

THESIS

Submitted in partial fulfilment of the requirements for the award of
Bachelor of Architecture degree

By

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JUNE 2021



DEPARTMENT OF ARCHITECTURE
BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of P.Krishna Priya (3621043) who carried out the project entitled “
” Redesigning the identity of Sivakasi-Establishing Legitimacy and dignity through under our supervision from January 2021 to June 2021.

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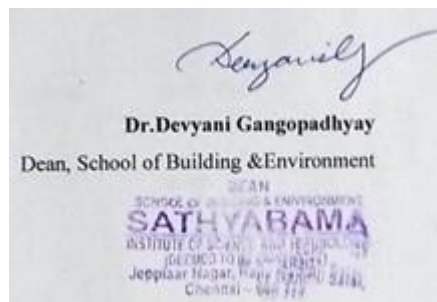
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DECLARATION

I, ~~hereby declare that the Project Report entitled "Redesigning the Identity of Sathyabama Establishing Legitimacy and dignity through~~
guidance of **Ar.S.G.Selvendiran** (Internal Guide), **Dr.Devyani Gangopadhay** (Internal Review
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Technology is submitted in partial fulfilment of the requirements for the award of Bachelor of
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ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **Sathyabama Institute of Science and Technology** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. Devyani Gangopadhyay**, Dean and Head of the Department, **Dr. Suresh Kuppaswamy**, Design Chair of School of Building and Environment, Department of Architecture and providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Internal Guide **Ar.S.G.Selvendiran**, Internal Review member **Dr.Devyani Gangopadhyay** and External Guide **Ar.Aravind Rangan** their guidance, suggestions and constant encouragement which paved the way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Architecture** who were helpful in many ways for the completion of the project.

I thank the energy which kindled this piece of thinking within me, to have found me this platform to explore, express and engage the dots carried throughout be connected and cherished. I'm grateful to the ways the time holds me to mould myself as the process has been demanding me to be grooved.

I hold all the gratitude to my mother, who has been supporting me in all her possible ways every single time of every single day. I hold an unconditional love and respect for your sacrifices and contributions in making me for what I am today

To Ar. Lalit Kishore Bhati(Urban Planner, Auroville) who has always been there for me to express my emotional baggage on the topic and regain the clarity then and there. I am always grateful for having to cross my path with yours.

To Ar. Harshil Parekh (Faculty at CEPT)-who helped me in developing a coherent understanding and the depth of the study with all the possible motivations gearing me throughout my study and I take this opportunity to thank you with all that I have and assure to pay this act forward in the future.

To all my friends, seniors, juniors and well-wishers who has always been my support system in keeping me moving with a sign of hope and always wished the best for me. I hold all the respect, love and gratitude to each and every role that you have played in the process.

PREFACE

“Great design is a human right. We have a right not just to housing, but to purposeful spaces that serves our needs.”

-MICHAEL MURPHY

To see with the eyes, to listen with the ears and to feel with the heart of another is empathy in life, but to design for the need of people along with them is to embrace the empathy and emotion in architecture.

Architecture, when taken and rendered to the deprived, has, inarguably remained to be a great tool by far in bridging many gaps, socially, climatically, financially and emotionally. Architecture is not for a selected few but EVERYONE. This Thesis “OWNING AN ADDRESS- ESTABLISHING IDENTITY AND DIGNITY THROUGH ARCHITECTURE” is the child and bearing of my dissertation on “DESIGN FOR OTHER 94%:Quality of Living-A Right or A Legacy”. The entire process, thinking, ideologies and design development is the reflection of what I have observed, etched, thought over and lived with for all these years and to cherish the question that my innocent and naive gut kept asking me all this while. Through architecture as a career and as a tool, I wish and hope to bring in many and more such projects which can address social issues from its root and reflect the solutions with its process thereby engaging the end user which in itself will feed the change and aspiration for a dignified and better quality in living in all layers of classes.

ABSTRACT

Quality of living is a basic right to sustain oneself under circumstances which determine the state of content physically, psychologically, socially, environmentally and in many more layers. It also dictates the ability of the people to flourish themselves by rendering them with the right opportunity, which adds to the charm of being their host until then.

Placing the urbanization, rapid population growth, diverse needs and wants in parallel and witness the blooming of many more occupations with respect to many more needs and wants: the world is running behind satisfying people, people's diverse needs: ranging from a simple pencil to a posh branded cars and what not. Every person is in this cycle of rendering some product or service or maintenance of the same to one another. What we resource from someone (corporate), we resource (work/job) something in return and that is our social cycle and table of life.

Given this reality hit and considering the last layer in the table yet the first in circle of creators/ manufactures are unfortunately with us in this 94% because they managed not to fall into the deprivation of being called to be under poverty by authorities yet are ignored in large range of scale.

This thesis is in regard with identifying such communities as mentioned in the Methodology of my dissertation, followed by coherent understanding of the context, bridging the understanding of the issues with architectural solutions.

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1. INTRODUCTION

1.1INTRODUCTION

Across all sections of the people, there is an urge to “live better”. Living better is not just a glimmer of hope and ignition amongst the major classification of the population but also a tangential dilemma of whether it is a right or a legacy to live for it to happen. The distinction between sufficiency and equality allows us to see how profoundly the age of human rights, while a good one for some of the worst off, has mainly been a golden age for the rich. The meaning of human rights has slowly transformed as egalitarian aspiration has fallen. (Not Enough — Samuel Moyn).

Having discussed this in my dissertation here I bring upon the real life context of such families who are struggling to make their ends meet by just graciously ignoring the real time facts on the risks that such livelihood is posing on them. Here, the dissertation's last part is identifying the study, and developing a coherent understanding and analysis to aid in recognizing the gaps and thus employing the architectural aid to service.

1.2AREA OF CONCERN/INTEREST:

Architecture is not just meant to stack up spaces and keep acquiescing in to people who already own options, but to also start equipping our field with diverse knowledge on many social, environmental, psychological aspects and reach out to the major crowd rather than sticking to the 6% population of every time. The area of interest here in this architectural thesis, is to take a step in identifying where there is a need, rising from a social issue which holds multidimensional vulnerability on the user groups, where the user groups are not in need of merely a roof above them but are tangled in much and more serious toxic circle. Therefore, the thesis is to gradually reflect the current conditions of the people in multifold layers of interest (social, economic, educational, health and sanitation, social security, etc) and develop coherent design programs and spaces that aid in rebuilding a life that subsists much essential principles.

1.3 AIM:

To vividly understand a community chosen based on their occupation in lead and mapping the tangential complexity imposed on the people, thereby coherently analysing the contextual studies on various social layers thus to state the problems. The ultimatum is to develop an attitude through architecture, spaces and reflection, for the user to find their identity, rights, equality and dignity in life and seed aspiration to the future generations of the community.

The following chapters will present/reflect my diversified research on such communities which took up such occupations and an in-depth and coherent study on them from which I have narrowed down to one and explored my thesis further.

1.4 OBJECTIVE:

As my thesis is an extension of my dissertation, the objective is still to :
Understand the issues in the living standards adopted by the people through many layers : socio-economical, psychological, physical, political etc.

- Analyse the design interventions that had made a substantial impact on the people in bringing them out of the stranded situation, adding a sense of dignity and pride in spaces and living.
- Analyse the expectations of people based on the indices fixed with an approach to determine the issue more locally and initiate the problem solving method to the issues identified.

1.5 SCOPE:

This thesis explores the quality of living at a more substantial level, where it is concerned in aiding and supporting the end -user (through architecture) to securely attain the first two layers in Maslow's Hierarchy of needs: Physiological needs and Safety needs. This thesis demands more than just understanding the design ideologies, principles: the quality of living, socio -economic complexity, psychological impact, social security & safety and many more.

1.6 METHODOLOGY:

- **CHOOSING THE STUDY AREA**
- **REASONING SPATIAL WELL BEING TO BE A FOCUS**
- **PRIMARY SURVEY/SECONDARY SURVEY**
- **MAPPING, ADDING DATA TO GENERATE ON ITS IMPACTS**
- **IDENTIFYING THE LOCAL/ REGIONAL CAUSE AND THE GAP**
- **THEORETICAL ANALYSIS ON DEVELOPING A COHERENT ARCHITECTURAL DESIGN PROGRAM FOCUSING ON THE WELL BEING OF EVERY USER FROM KIDS, MEN, WOMEN**
- **IDENTIFYING A STAKE HOLDER (GOVERNMENT/NGO/ CLIENT)**
- **THUS MAKING IT A PARTICIPATORY DESIGN**
- **IF NOT A HYPOTHETICAL DESIGN**

CHAPTER 2

**UNDERSTANDING THE OCCUPATIONAL
DIVIDE**

2.1 WHO ARE WE ADDRESSING THE THESIS TO (USER GROUP)?/ UNORGANIZED SECTOR IN INDIA:

The poverty profile of workers in the various industry groups showed that more than 50 per cent of the agricultural workers in the urban areas and nearly 43 per cent of the construction workers were below the poverty line in 1999-2000. Nearly 30 percent of workers in manufacturing, trade and hotels, transport and other services were poor. As mentioned in Occupational Vulnerability of Urban Poor by Vijayan foundation and Oxfam India.

The quality of living has always taken the toll in the life of the workers in various industries rapidly transcending from agriculture and other native occupation to other service-oriented occupations which lightly fall under the unorganised category of occupation. Their livelihood is at risk and they are consistently hit by multidimensional vulnerability as discussed in the Occupational Vulnerability of Urban Poor by Vijayan foundation and Oxfam India which includes:

2.2 IDENTIFYING THE MULTIDIMENSIONAL VULNERABILITY IN OUR SCOPE:

- Structural exclusion:
- Urban poor are the victim of structural exclusion as they fall into deprivation from identity and basic entitlements, which later push them to migrate elsewhere where they are forced to fall in the unaccounted population and later denied existence by the civic authorities.
- Non-availability of regular gainful employment and shrinking spaces for employment and self-employment.
- This in turn reflects in forcefully engaging them in multiple varieties of casual labour to keep earning their daily bread. To them, the worst thing to happen in such a scenario is to not find a job for months together while this is the only source of income to run the family.
- Non-availability of basic facilities and services including drinking water, sanitation, transportation, energy, safety and security.
- No provision for social security:
- The vast unorganized sector lives without any provision of social security which should necessarily include
- -Compensation that provides for income security and is based on the idea that during the spell of risks, the individual and his family should not be subjected to a double calamity involving both destitution, loss of health, limb, life or work.
- Non-availability of safe and secure shelters and insecure undignified space provision for living.
- The living conditions are highly Unsafe/unclean and more vulnerable working conditions.
- The working conditions of the urban poor workers is highly unsafe and unhygienic. Worksite accidents and insufficient and ill-maintained toilets are major issues which are less worried about and taken care of by the officials.

2.3 CATEGORIZATION OF WORKERS:

To address and locate a specific group/ community of people who are defined through their occupation amongst the unorganized sector it is necessary to understand the classification and categories to relate and select the type.

The list of professions as listed by the Government of India-Ministry of Labour & Employment, around a list of 127 professions/ occupations were taken into consideration which included a diverse range from agarbatti making to rag-picking to welding as an occupation. (From <https://labour.gov.in/list-professions-occupations-covered>)

This still felt to be more on a broader end and thus the process demanded to develop thinking where the profession plays the central role to equip and develop a betterment in the lives of the people. Such scenarios are in real existence when ignored and taken lightly by the employers creates the struggle and every other issue falls in the line thus making even a secure toilet to be at reach a luxury.

This in other words when tried to perceive felt to have a perfect fit in under house based occupations. These are the professions done with a security of a roof above the people and in a shallow way seem to reduce other loads by just being at home and doing mechanic work.

2.4 IDENTIFIED UNORGANIZED WORK/COMMUNITY

From various lines and traces, the following are the communities that are taken for pilot study

3. COMMUNITY STUDY

3.1 BEEDI WORKERS

3.2 ETIKOPPAKA TOY MAKERS

3.3 CONSTRUCTION LABOURERS

3.4 FIRECRACKER WORKERS, SIVAKASI

3.5 COMPARATIVE ANALYSIS OF THE COMMUNITY STUDIES

4. SELECTION OF COMMUNITY AND SITE CONTEXT

4.1 EXPLORATION OF PROBLEMS

5. CASE STUDIES

5.1 CASE STUDIES BASED ON POSSIBLE TYPOLOGIES

5.1 CASE STUDY BASED ON IDEOLOGY

6. CONTEXT STUDY

6.1

6.2

6.3

CHAPTER 3

COMMUNITY STUDY

3.1.1 UNDERSTANDING THE INDUSTRY:

It falls in both the organized and unorganized industries.

The Law on Beedi and Cigar Workers (Employment Conditions), 1966 has a considerable number of workers working in the organized sector involved in bidi rolling, processing, inspection, baking, labelling, wrapping and packaging. In the organizing market, Central Excise (Rs. 9/-) (Excise Duty Rs. 4.60, Cess Rs. 2 '00, Extra Duty Rs. 1.40 and NCF 1.00) for a cost of 1000 bidies are subjected to the bidi manufacturers.

The small bidi companies producing up to 20 lakh bidis per year in the unorganized sector are excluded from excise duties. The number of Bidi Rollers used by these small bidi manufacturers is very difficult to find an estimate. As a consequence, employees are stripped of the privileges of the different labour agreements and are notified by the compliance officers.

The heart of the bidi industry is Trademark Institutions or Brand Institutions. They perform tasks such as raw material delivery, sampling, inspection, baking, labelling, packaging, and bidis marketing.

3.1.2 ISSUES IDENTIFIED IN THE WORKING SYSTEM

The activity of rolling bidis is normally assigned to domestic workers, in particular women, either directly by trademark institutions and contractors, as the most labour-intensive activity.

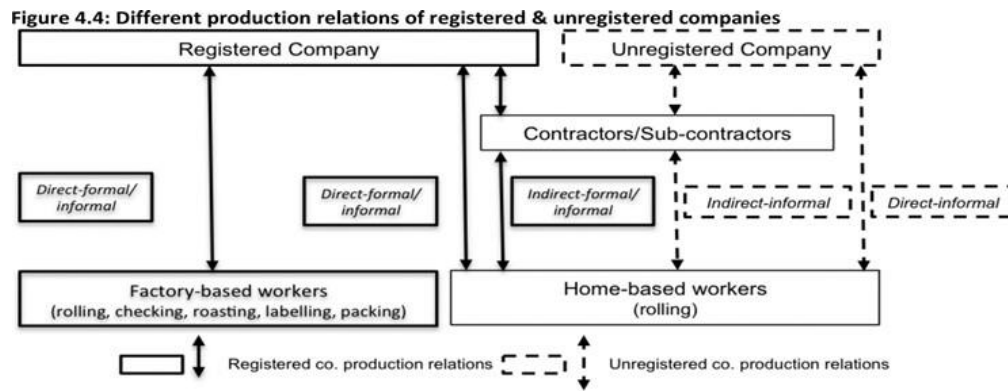
They provided to directly working employees or regularly via the contractors the raw material - tobacco, tender leaves and yarn.

Contractors were rolling their bidis from the Bidi Rollers through a network of collection centres in the Bidi Rollers' housing clusters.

The Bidi Rollers are supposed to be registered with the bidi establishments.

Many Sattedars were found to be rolling the bidis out of villages but difficult to find, as there were no set places where raw materials and rolling bidis could be distributed.

In most instances, the domestic workers knew not even the names and addresses of the middlemen or Sattedars, as their homes were distributed with raw materials.



Source: Prepared based on Madheswaran et. al. 2006 & Best Practices Foundation 2001

Fig 3.1 Product relations in Registered Vs Unregistered Company

3.1.3 SPRAWL OF WORKERS IN TAMIL NADU

Most beedi employees concentrate in Tamil Nadu in the district of Tirunelveli and Vellore. As for other districts, e.g. Thoothukudi & Kanyakumari, their number is not recorded and hence they do not have all benefits for beedi jobs protected by social welfare schemes.

Four-fifths of Tamil Nadu's overall beedi jobs are located in Tirunelveli County.

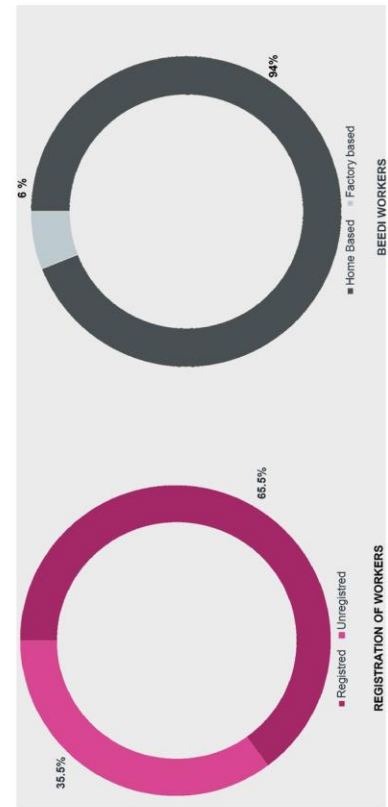
In Tamil Nadu, Tirunelveli, which employs nearly 400,000 people, is the largest centre for Beedi's industry in the region.

Tirunelveli district, Tamil Nadu reported that beedi production in India is one of the primary businesses in rural regions and has existed for centuries in the beedi industry.

3.1 BEEDI WORKERS



Every now and then we are all preached to avoid/ discontinue the toxicity of substances like cigarettes, bidi, kaini, Zarda etc. claiming they are harmful for us in the long run. But what happens behind the screens of the production houses of these toxins? More specifically what happens to that person who is currently rolling hundreds of the tobacco leaves risking every second of their lives every day to feed their families?



Currently, India is the third largest tobacco producer in the world. The tobacco industry not only earns revenue for the state it also generates employment of a large scale.

The recent research found that “while about 96% of the total beedi workforce in India are home-based, a mere 4% work in factories. Only 62.5% of beedi workers have ID cards, which shows that about 37.5% beedi rollers do not have any formal recognition in the industry.

There is a need to focus on skill development programmes, for alternative livelihoods so that as the workers become more skilled they could move away from this occupation. This is going to be a challenge considering the rising age of workers in the industry

PLATE 3.1.1 BEEDI MAKING PROCESS



JUSTIFICATION FOR THE SELECTION OF THE COMMUNITY

(i) Over 48,00,000 people are working in this sector of manufacturing industry.



(ii) Diverse age groups involved and affected.



(iii) One amongst the major unorganised sector all over India



These are people who don't have much options other than this and are also not permitted to quit easily. Simply stated their helplessness makes this job a compulsion. These are workers who are stripped of their identity, their wages, their PF and upon all their health is at constant endangerment with their prolonged exposure to these leaves.





IDENTIFIED ISSUES

1. Unequal distribution and implementation of the welfare schemes

2. Living and the workplace: SAME

2.1. Live in one room house/huts

2.2. poor lighting and ventilation

2.3. poor or no working furniture aids



3. Women major employment-discrimination



4. Predominant CHILD LABOUR



5. Education attained only to Primary level



6. Due to low wages lack in money leading to NO NUTRITIOUS FOOD.



7. Poor or no regular funding to the Health Care Facility and no regular inspection on the service rendered.



8. Open defecation and poor or no women sanitation facilities

9. Lack of Awareness of their privileges

10. Lack of Awareness on all the applicable Schemes



FINDINGS

1. Majority of the workers are unregistered and without IDs.

2. Political/governmental tricks and politics from reaching the schemes and privileges to the workers

3. Careless and Greedy attitude of the Big industry owners and the contractors employed by them.

4. No consideration for the wasted Beedis according to the law.

5. Major Women and Girl Child involvement in the working and making of Beedis.

6. No betterment observed in their lives and living conditions.

7. Beedi making is the major source of Income to the family.

PLATE 3.1.2 JUSTIFICATION, IDENTIFIED ISSUES AND FINDINGS

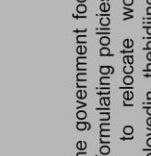
 1. Proper Governance and system employment by any collaborative Team, can enhance the regular reach of the wages and other privileges.		WORK CONDITIONS DUE TO RATE/PIECE SYSTEM The prevalence of piece rate / wage in beedi industry. It is important to note that such inadequate wage pulls other members from the family, for example even children attending school, in beedi works. Therefore, it is obvious that wage deprivation in beedi works enhances child labour. Almost all the beedi workers especially women involved are working at home itself in poor and unhealthy environment and hence it bring hazards to their health. Therefore, such home-based industry has to switch over to factory-based to ensure the extension of welfare measures for them.
 3. Involvement of ASHA(Association for Social and Health Advancement) helps in capacity building.		MEASURES FOR BETTER LIVELIHOOD OF THE WORKERS • As both poverty and unavailability of viable employment forced them to beedi works for meagre wages alternative employment opportunities has to be made available. • Skills to be imparted to prevent women involved in beedi works from all sorts of exploitation and harassments. • Commute to hospital for regular health check-ups; • Govt. health and education services must be made easily accessible for them as they cannot afford private services.
 2. Proper and effective implementation of ALL IMPORTANT SCHEMES: can enhance more opportunities to reach and engage the worker's sector/community.		POSSIBILITY IN CHANGES IDENTIFIED 5. The government focuses on formulating policies that aim to relocate workers employed in the industry to alternate sectors which provide better job quality with higher wages, along with social security and employment benefits. This can be done under flagship schemes

PLATE 3.1.3 POSSIBILITY IN CHANGES IDENTIFIED

Living conditions The households, being poor, generally inhabit one room houses or small huts, which are ill equipped with respect to air, light and water. For women who work at home in small huts with very little ventilation the tobacco dust remains in the home where women and their families eat, sleep and spend their entire time. The scarcity of space where both living and working goes on, poses problems at times. This is particularly acute in the urban areas where space is a big constraint. The raw materials together with discarded leaves, cut pieces of the leaf, tobacco dust and so on lie scattered around in the homes of the workers. In addition, the fumes and dust of tobacco pose tremendous health hazards to women workers and other members of their family, especially children.	Most dwellings of the beedi workers are poorly maintained with unclean surroundings. Many of them don't have their own houses and instead stay in rented dwellings which add to their burden. This is the situation particularly in the urban areas. Within the villages the situation of those coming from the SC community is the worst because most of them don't own any land. Apart from that they also face discrimination at multiple levels. 
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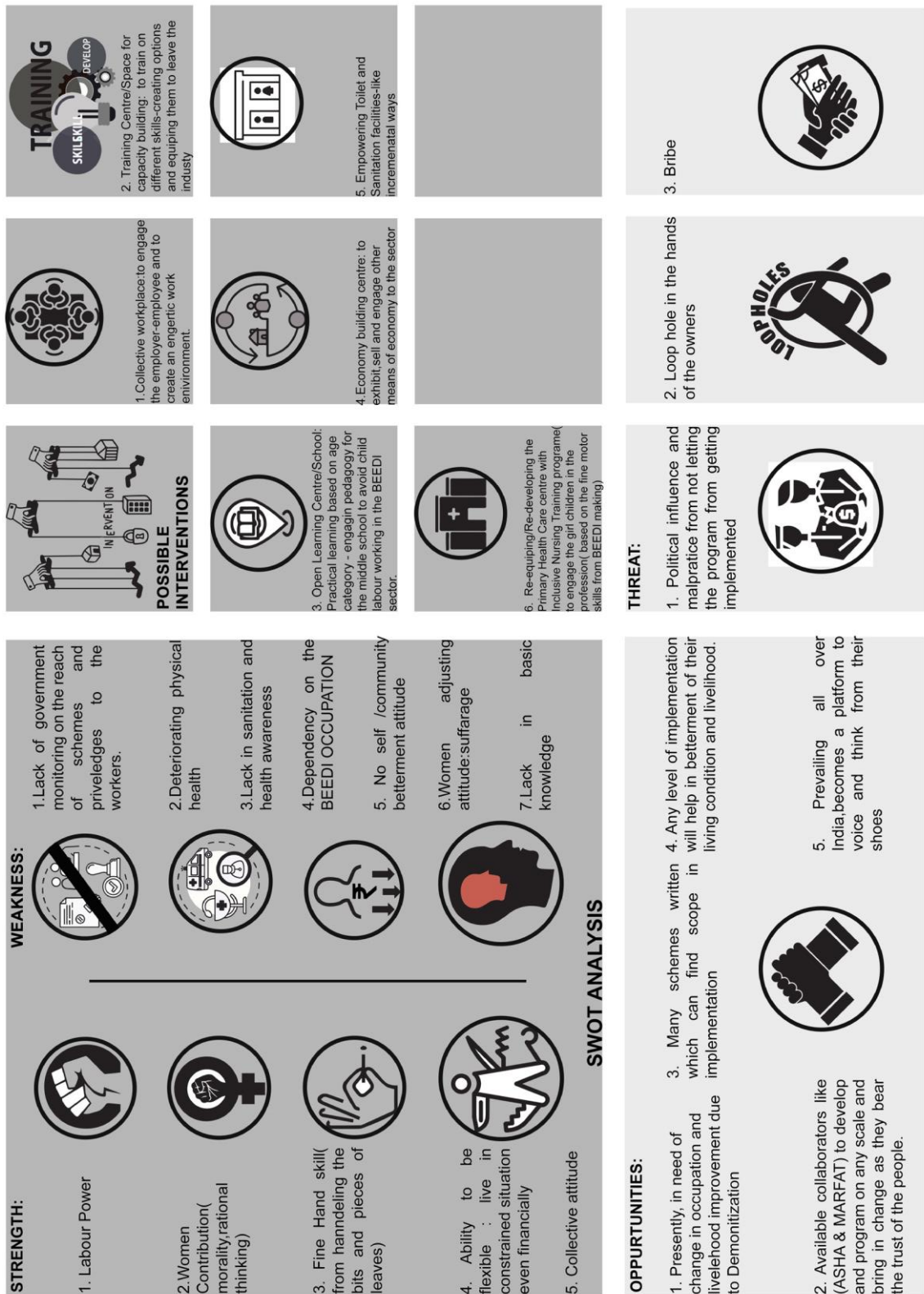


PLATE 3.1.4 SWOT ANALYSIS ON THE COMMUNITY

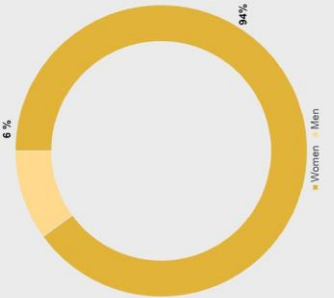
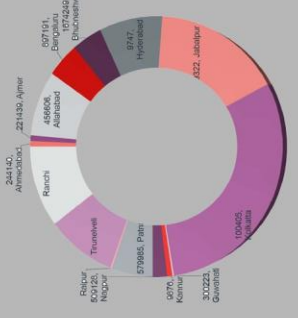
SPRAWL OF WORKERS IN TAMIL NADU In Tamil Nadu, most of the beedi workers concentration is found more in Tirunelveli district followed by Vellore. As far as in other districts, for example in Thoothukudi & Kanyakumari, their number is not reported and hence they are not covered under social welfare schemes as a result not availed of all benefits for beedi workers.	CASE OF TIRUNELVELI DISTRICT About 90% of the beedi workers are women; four-fifth(4/5) of total beedi workers are in Tirunelveli district; as no male member from their family is ready to work beedi industry is the only source for their livelihood so that it become "home-based industry" and hence it is the home for all kind of legal / employment violations.  RATIO OF MEN & WOMEN BEEDI WORKERS AT TIRUNELVELI	ISSUES IDENTIFIED 1. Social welfare schemes for beedi workers are extended and implemented only in the districts where their concentration is found more; and not in the districts where their number is less.	2. Few manufacturers provide Rs. 215/- to per 1000 beedies without PF, pension, medical allowances etc.
Of the total beedi workers found in Tamil Nadu four-fifth of them are found in Tirunelveli district In Tamil Nadu the biggest centre for Beedi industry is Tirunelveli district with close to 400,000 workers Tirunelveli district, Tamil Nadu stated that in India beedi manufacturing is one of the prime occupation in rural areas and beedi industry is existing for centuries.	3. It is important to note that as per law if the manufacturer rejects beedies received from the workers he has to pay wage for such rejected beedies. But in reality due to loss of employment nobody can demand wage for such rejected beedies. Therefore, it ensures a basement for dual exploitation viz., labour and sexual.	4.Access to water, sanitation and food Though sanitation facilities are improving in the state due to various initiatives taken by the government, non-government actors and own initiatives of people, open defecation is still a reality in most villages where discussions with beedi workers were held. Even in villages where people have toilets in their homes, lack of sufficient water is a big limiting factor preventing the usage of toilets	4.Access to water, sanitation and food Though sanitation facilities are improving in the state due to various initiatives taken by the government, non-government actors and own initiatives of people, open defecation is still a reality in most villages where discussions with beedi workers were held. Even in villages where people have toilets in their homes, lack of sufficient water is a big limiting factor preventing the usage of toilets
 STATEWISE POPULATION IN THIS SECTOR	 Concentration of people working in this occupation	5. Health System and its Accessibility The Beedi Workers Hospital at Mukuddal town in Tirunelveli District is the only one in Tamil Nadu for beedi workers. It serves the population coming under a 15 km radius of the hospital. Shortage of funds is seriously affecting the services which can be provided to those who come here with an ailment, stated the CMO of the hospital	Living conditions The households, being poor, generally inhabit one room houses or small huts, which are ill equipped with respect to air, light and water. For women who work at home in small huts with very little ventilation the tobacco dust remains in the home where women and their families eat, sleep and spend their entire time. NET STUDY

PLATE 3.1.5 NET STUDY -LOCATING THE COMMUNITY AND NARROWED ISSUES

7. HEALTH ISSUES THROUGH THE OCCUPATION

• Major occupational health problems of beedi workers are aches, pain due to sitting in same posture for prolonged hours, skin problems, kidney and respiratory problems.

• Cough, Neck Pain, Back Pain, Knee Pain, Leg Pain, Finger Numbness, Eye Inflammation, Stomach Pain, Gastric Trouble, Head Ache, Ulcer are common among them

• **PROBLEMS IN WOMEN:** A significant proportion of women are suffering of Asthma, Throat Inflammation, and Difficulties in Breathing, Arm / Shoulder Sprain, Leg Swelling, Difficulties in Sitting, Hand Sprain, Eyes Tears, Eye Defect, Constipation, Tachycardia, Giddiness, White Discharge, and Infertility due to beedi works.

8. There is a **need to focus on skill development programmes**, for alternative livelihoods so that as the workers become more skilled they could move away from this occupation.

This is going to be a challenge considering the rising age of workers in the industry. **Agriculture and MGNREGA could play a key role in becoming source of an alternative livelihood, at least in the short-term**, provided the constraining factors are addressed.

MEASURES FOR BETTER LIVELIHOOD OF THE WORKERS

• As both poverty and unavailability of viable employment forced them to beedi works for meagre wages **alternative employment opportunities has to be made available**.

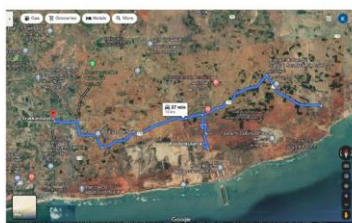
• **Skills to be imparted to prevent women involved in beedi works** from all sorts of exploitation and harassments.

• **Commute to hospital for regular health check-ups;**

• **Govt. health and education services must be made easily accessible for them** as they cannot afford private services

PLATE 3.1.6 NET STUDY -LOCATING THE COMMUNITY AND NARROWED ISSUES

SITE



MAP SHOWING THE 3 VILLAGES LINK



MAP SHOWING THE DISTANCE FROM VIJAYAPATHI TO KOODANKULAM



SOME IDENTIFIED SPOTS AT KUDANKULAM



MAP SHOWING THE DISTANCE FROM KOODANKULAM TO ERUNKANDURAI



SOME IDENTIFIED SPOTS AT MUKKUDAL

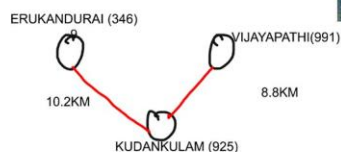


PLATE 3.1. 7 NET STUDY -LOCATING THE PLAUSSIBLE

SITE

3.1.4 POST VISIT ANALYSIS.

From the visit, it was evident that this sector of workers are already in view of people who are volunteering to help them get a better lifestyle like UDAVUM KARANGAL(a health and capacity building based NGO). They are much focussed on diagnosing cancer in the people who are working in this sector. Along with it, they are also keenly involved in bringing other occupational training to the reach of the people like tailoring, beautician courses, etc.

Further from the visit, the people are living in clusters that are sparsely spread and hard to define a boundary to their existence in a sector.

The current generation also already have developed an attitude to never see Beedi Rolling as an occupation and hence the students of this sector are keen on pushing themselves through education. This district is one among the better pass percentage scoring in the state.

3.2 ETTIKOPAKKA TOY MAKERS

3.2.1 UNDERSTANDING THE INDUSTRY

The Toy industry in India is as old as our civilization. India has always had a rich history of toys. In India, toys are made from wood, metal, cloth, bamboo, stone, terracotta, etc. among others. Every state in India has its own unique art and skill of making these toys.

3.2.1.1 TOY CLUSTERS IN INDIA

Wood and terracotta from Sambalpur in Odisha, clay toys from West Bengal and Madhya Pradesh, terracotta toys from Tamil Nadu, wooden toys from Channapatna in Karnataka and Etikoppaka and Kondapalli in AP, and bamboo toys from Tripura, etc.

3.2.1.2 INDIGENOUS TOYS IN EDUCATION

As we see many kids attached to mobile phones, we need to find ways to shift their attention from phones to real toys. Learning and teaching with toys have many benefits for children. It promotes experiential learning as kids get to touch the toy and finish an unfinished project. Toys can be used to teach languages, maths, and even sciences. It speeds up language development and encourages teamwork, curiosity, and social interaction.

3.2.2 HISTORY OF THE TOY MAKING IN INDIA

In today's India, the legacy of toy makers continues to keep their craft alive. The situation quo in the 90s would tell us a different story. Almost 90% of the country's toy demands were met by the indigenous artisans and only a small portion of the local toy market had foreign supplies coming from the US, UK, France, Italy, Japan and Germany.

The liberalization of the economy in 1991 changed how children played, as it did with everything else. China made toys began to flood the market.

Even though the wooden toys remained popular, the balance would soon get tipped as children started preferring mechanised China toys over the traditional ones.

India struggled to keep up with the pace at which the toy market was booming in china.. Labour laws, taxation issues, lack of technology and poor government incentives meant no major industrial house ventured into the segment. Compared with China's end-to-end, integrated manufacturing facilities, India's small-size factories further impeded the growth.

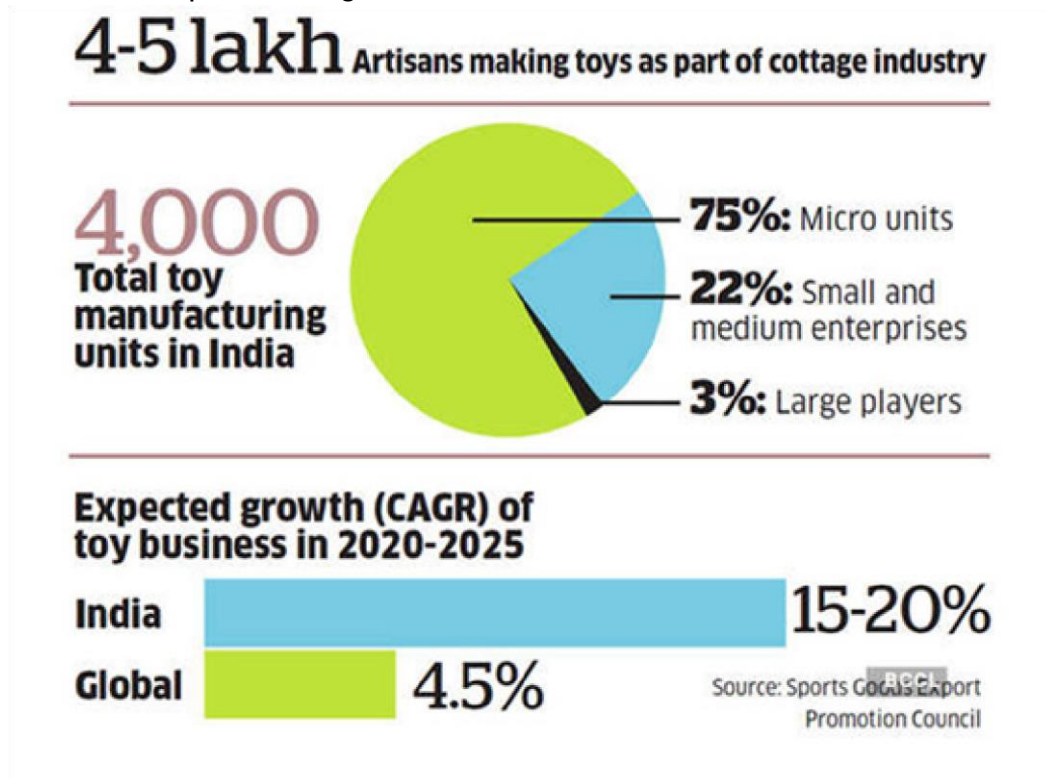


Fig 3.2.2.1 percentage data from a survey

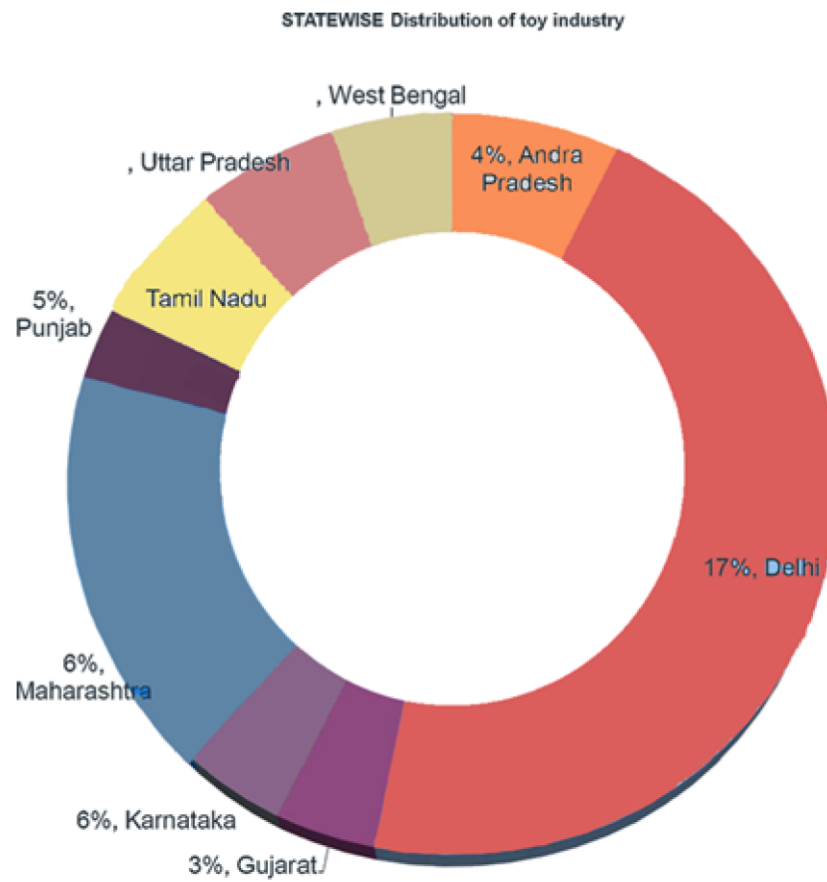


Fig 3.2.2.2 STATEWISE DISTRIBUTION OF TOY INDUSTRY
3.2 ETTIKOPAKKA TOY MAKERS

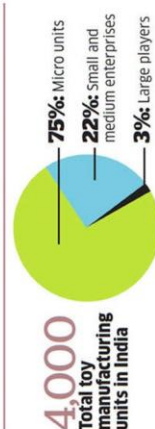


From pleasing our loved ones to marking our styles in-evidently handicrafts have been a personalized way of expressing our love and gratitude. The hands that created these are of the artisans that pour their strong sense of creativity and skills into these masterpieces of wood and dye.

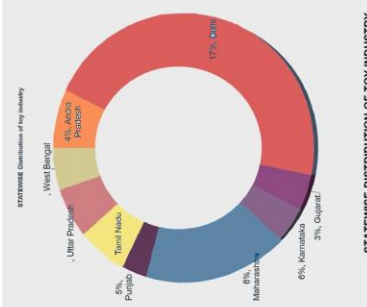
Home to more than two hundred artisans who breathe life into wood, the village of Etkoppaka in Visakhapatnam district of Andhra Pradesh has an inspiring story to tell.



4-5 lakh Artisans making toys as part of cottage industry



Expected growth (CAGR) of toy business in 2020-2025



STATEWISE DISTRIBUTION OF TOY INDUSTRY

The art of making traditional wooden Etkoppaka toys is more than 400 years old and it has been traditionally handed over to them by their ancestors through generations.

One of the biggest advantages and unique things about Etkoppaka toys was that they were well rounded and made using natural dye colours. This made them safe for kids.

Etkoppaka was known for making wooden articles to measure grain for farm and domestic use, as well as temple cars to carry deities in processions. From those times before the 20th century when a range of colours was unavailable, to the explosion of synthetic dyes, to the contemporary return to natural sources, the story of Etkoppaka is one of a persistent effort to uphold a craft form that sustains the lives of its artisans.

The livelihood of these artisans are constantly being challenged due to the lack of recognition, the innovation and enhancement of designs, basic material shortage and penalizing by forest department. The intervention of various educated organisations into stabilizing this community by providing more knowledge on the creation of ethnic and indigenous cultural designs.

PLATE 3.2.1 TOY MAKING PROCESS

 JUSTIFICATION FOR THE SELECTION OF THE COMMUNITY	 (i) Lakhs of artisans are working in this occupation for their daily bread and butter					 IDENTIFIED ISSUES	 1. Irregular supply of wood	 2. Penalty from the forest department	 3. Frequent Power cuts	 4. Lack of innovation and evolution in the designing	 5. Less market due to China Toys(Mass Production)	 6. Health and Sanitation 6.1 No community toilets in the locality	 6.2 Stress on neck and back due to the posture during work	 7. Inconvenient work environment	 8. Poor quality in the end product.	FINDINGS 1. Every wood article is finished in various units dedicated to woodcutting, wood turning, polishing and carpentry 2. Have long working hours(10 hours and 6 days a week) 3. Beyond the traditional wood workers, the sector also gives job opportunities to the weaving communities who could not find much profit in their stream of occupation. 4. The toys are made with wood and natural dyes. 5. With some change in the monotony in design, the field is capable of finding international merchandise and employ more people. 6. Involvement of central government on funding proposal for this working sector and as well supporting the cost
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PLATE 3.2.2 JUSTIFICATION, IDENTIFIED ISSUES AND FINDINGS

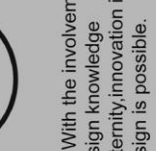
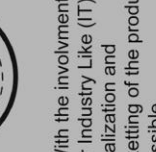
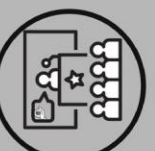
Toy makers are finding it difficult to sustain themselves, in part because of the wood shortage but also because many Indian parents show little interest in teaching children about their heritage.	CHALLENGES FACED BY THE ARTISANS Most of the challenges that craftsmen and artisans are in terms of design and marketing.		 1. With the involvement of design knowledge fraternity, innovation in design is possible.	 2. With the involvement other Industry Like (IT) Globalization and Marketing of the products is possible.
WORKING ENVIRONMENT The operating workplace of the worker are usually dusty. No one uses precaution like masks. The surrounding in working rooms in very humid. The factories are usually sheet/shed factories.	They can continue to make toys with old designs but that will not help anyone. Therefore, they should understand the market trends, and make themselves trained enough to compete with foreign players.		 3. With the mentioned Government proposal execution : BETTER LIVELIHOOD IS POSSIBLE TO HAPPEN	 4. Involvement of women in the field enhances the quality of work
Use of bare hands while working can be hazardous to them. The workers stop working when there is no profit and they show no much interest in teaching art to the next generation if there is good export, it can be a good motivating factor for them to work harder.	Craftsmen and artisans need to diversify their skills, have market linkages through e-commerce sites, and have financial support, funding, and incubation support to grow and contribute to the country's economy.		 5. Role of ATMA NRBHAR BHARAT and the plausible interventions proposed to support this sector.	 POSSIBILITY IN CHANGES IDENTIFIED
WHY THE TOY INDUSTRY MEANS MUCH TO INDIA Employment to over 2 million people(70% women workforce) Workers mostly from economically and socially weaker sections. Estimated Industry turnover is approximately 1500crores in rupees in the organised sector and about 2500 crores in the unorganised sector.	POSITIVE POINTS ON THE INDUSTRY AND VILLAGES INVOLVED 1. Still very much a cottage industry, it is an artisan driven craft that could truly blossom under a cooperative armed with business insight. 2. One of the biggest advantages and unique things about Etikoppaka toys was that they were well rounded and made using natural dye colours. This made them safe for kids			

PLATE 3.2.3 POSSIBILITY IN CHANGES IDENTIFIED

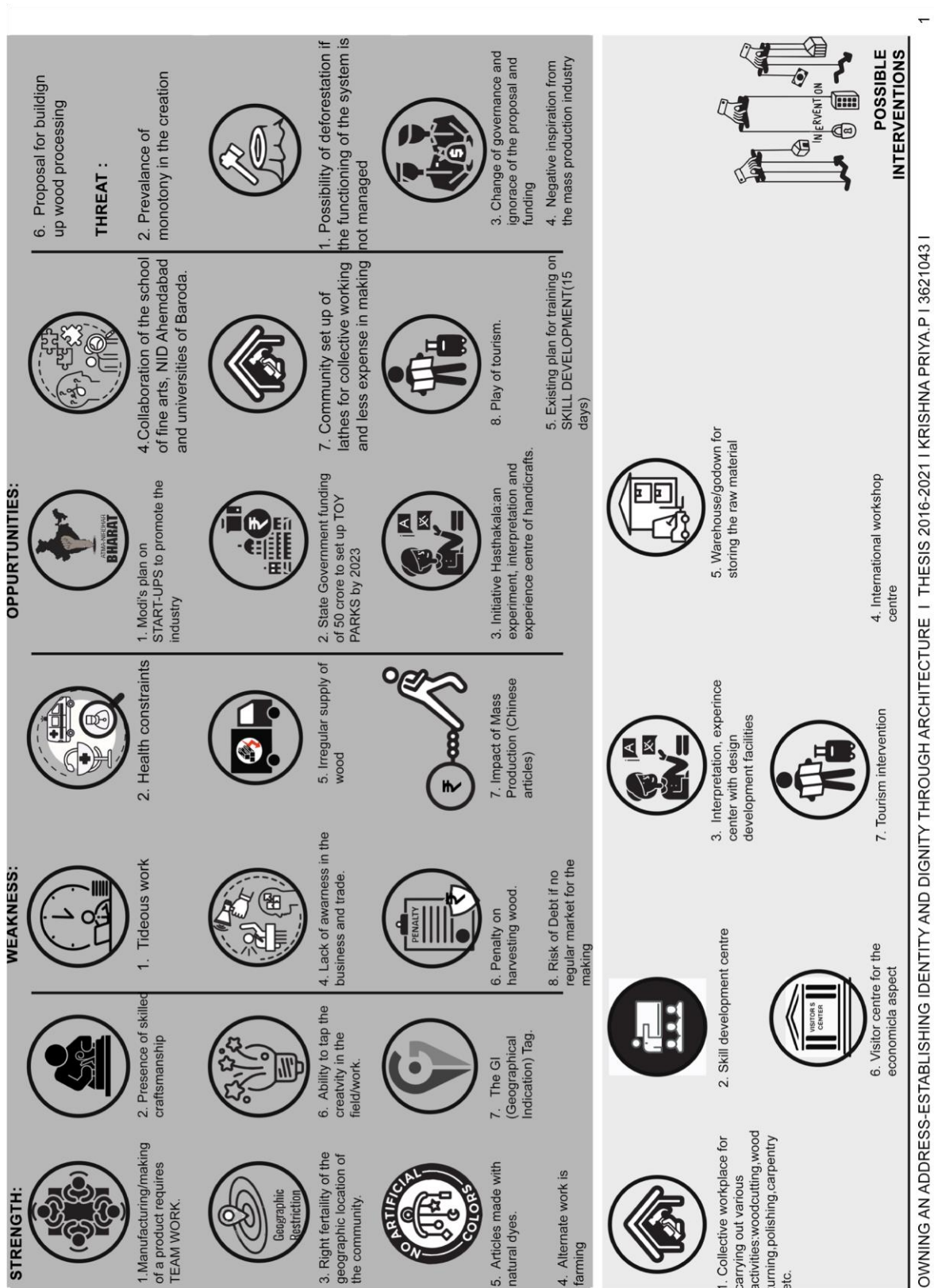


PLATE 3.2.4 SWOT ANALYSIS ON THE COMMUNITY

CASE OF VISHAKAPATNAM

Home to more than two hundred artisans who breathe life into wood, the village of Etikoppaka in Visakhapatnam district of Andhra Pradesh has an inspiring story to tell.

Meaning Koppaka on the stream, the village grew up around the waters of the river Eru (also known as Varaha). It is named after Koppa Raja Narayana of the Eastern Chalukya dynasty branch based around Elamanchili. The area also has an ancient Buddhist mercantile heritage.

Etikoppaka was known for making wooden articles to measure grain for farm and domestic use, as well as temple cars to carry deities in processions.

From those times before the 20th century when a range of colours was unavailable, to the explosion of synthetic dyes, to the contemporary return to natural sources, the story of Etikoppaka is one of a persistent effort to uphold a craft form that sustains the lives of its artisans.

Prime Minister Narendra Modi's call for making India the world's toy manufacturing hub as part of the 'vocal for local' slogan came as a big push for the manufacturers of Etikoppaka toys, who are now hoping to soon get the mandated certification to declare that the toys don't contain toxic elements, so they can market the toys in the US and Europe.

AT ETIKOPPAKA, VISHAKAPATNAM

Etikoppaka was known for making wooden articles to measure grain for farm and domestic use, as well as temple cars to carry deities in processions. From those times before the 20th century when a range of colours was unavailable, to the explosion of synthetic dyes, to the contemporary return to natural sources, the story of Etikoppaka is one of a persistent effort to uphold a craft form that sustains the lives of its artisans.

It is home to 12,000 people. Today, the communities practising woodcraft in the village include traditional woodworkers, as well as weavers who have abandoned their traditional vocation due to falling incomes and a lack of market linkages.

• The art of making traditional wooden Etikoppaka toys is more than 400 years old and it has been traditionally handed over to them by their ancestors through generations.

POSITIVE POINTS ON THE INDUSTRY AND VILLAGE

1. Still very much a cottage industry, it is an artisan driven craft that could truly blossom under a cooperative armed with business insight.
2. One of the biggest advantages and unique things about Etikoppaka toys was that they were well rounded and made using natural dye colours. This made them safe for kids



PLATE 3.2.5 NET STUDY -LOCATING THE COMMUNITY AND NARROWED ISSUES

ISSUES IDENTIFIED	MEASURES FOR BETTER LIVELIHOOD OF THE WORKERS	4. PLANNING LEVEL INTERVENTION FOR TIE-UPS:
1. The supply of wood is irregular, as the artisans require a small quantity which does not interest the forest department.	1. Lauding the revival efforts of the traditional artisan C.V. Raju of Etikoppaka in Visakhapatnam district, Modi said he wanted start-ups to promote the industry and secure the future of the artisans. 2. A back-of-the-envelope calculation by market players on the total annual business of wooden toy handicrafts in Etikoppaka, Kondapalli and Nirmal amounts to about ₹50 crore. This industry has tremendous potential and can provide employment to lakhs of people, according to market estimates	The IT firms, as part of CSR, give a lot of support to upcoming industries and handicrafts. We have made a plan to contact the top 10 IT firms to ask them if Etikoppaka toys can be made a part of their gifting plans. We are also approaching big-ticket wedding organisers asking them to opt for these toys as return gifts. We have positive signals from the market
3. In addition, after Chinese toys with high chemical content flooded the international market, importing countries have made their norms even more stringent.	3. Department of Science and Technology and the National Innovation Foundation in 2019 seeking help to make his initiative Hashtakala an experiment, interpretation and experience centre of handicrafts	5. The local artisans of Etikoppaka are assisted by the School of Fine Arts, Andhra University, National Institute of Design, Ahmedabad and M.S. University, Baroda besides individual designers to come up with new designs.
5. The human and ecological advantages of our traditional crafts have little currency in an age when mass production has taken centre stage.	4. Add to this frequent power cuts, and the artisans in Etikoppaka are in for another rough ride. 6. A fresh iteration of innovation in line with its tradition of implementing creative, new ideas seems to be the only way out of its current predicament.	6. The proposed building for wood processing is under way , according to Vijayawada MP Kesineni Srinivas (Nani). "We facilitated a ₹1.8 crore MSME fund, and a matching grant of ₹50 lakh was allocated from my MPLAD funds. The facility will be built soon
	7. Visakhapatnam city has very good connectivity, and establishment of a toy manufacturing park will open up job opportunities for the craftsmen apart from contributing to the revenue of the government 8. The picturesque village of Etikoppaka provides an ideal stop for tourists and prospective entrepreneurs alike.	9. Referring to Prime Minister Narendra Modi's call for 'Atma Nirbar Bharat' and the 'vocal for local' concept Mr. Madhav underlined the need for a national policy on toy making and constitution of an expert committee to make an in depth study and to set up toy parks/clusters in Visakhapatnam and other parts of the country. Toy manufacturing policy for the State toy manufacturing clusters and to set up a toy park in the State by 2023

PLATE 3.2.6 NET STUDY -LOCATING THE COMMUNITY AND NARROWED ISSUES

3.2.3 HOPE FOR TOYS IN IDIA

Almost 25% of the world's children aged under 12 reside in India, according to the World Bank's 2019 data. Accordingly, the toy demand at a domestic level is expected to grow at 15-20% CAGR between 2020 and 2025 compared to the global average of 5%, according to SGEPC.

India has the potential to be a toy hub, provided the right conditions are rendered to the industry like flexible labour laws and plug-and-play facilities in order to cut down expenditures related to setting up of factories.

India is currently witnessing the emergence of several hubs that are trying to catch up with the trend.. Koppal region in Karnataka will be seeing a toy manufacturing hub soon with an initial investment of Rs. 5000, while an industrial area at Khushkhera in Bhiwadi, Rajasthan has just been granted the permission to set up another one in Karnataka.

These hubs offer financial incentives, an efficient logistical network, integrated capabilities and flexibility in employment contracts, taking into consideration the seasonality of the toy industry.

3.2.4 SCHEMES

Central Government Schemes

1. Prime Minister Narendra Modi called for making India the toy manufacturing hub of the world and called on youngsters, state governments, and organizations to help the craftsmen, artisans, etc in boosting the local economy.
2. Scheme for Granting Recognition & Registration To In-House R&D Units
3. Remission of Duties & Taxes On Exported Products (RoDTEP)
4. Duty Drawback Scheme
5. Export Promotion Capital Goods (EPCG) Scheme
6. Custom Bonded Warehouse Scheme State Incentives
7. Capital subsidy
8. Stamp duty exemption
9. Interest subsidy
10. Tax reimbursement
11. Electrical duty exemption
12. The recent easing of India's labour laws and especially the provision facilitating time-bound employment will come as a positive for the Indian toy sector.

Product Specific Industrial Cluster Development Program

The development of India's first toy cluster is well underway in the state of Karnataka with 'Aequis Infra' ,, providing all state of the art industrial infrastructure with power, water, internal roads, and waste disposal facilities and common facilities like security, customs, and a Centre of Excellence. The cluster provides a tailor made, self-sustained ecosystem that sprawls over 400 acres of land, which includes an SEZ to serve export markets and domestic tariff area (DTA) for the domestic market. It

promises to create 40,000 jobs in five years and attract over INR 5,000 crore in investments.



beauty/article29103600.ece) in Andhra Pradesh, and Nirmal in Telangana (<https://www.thehindu.com/features/kids/From-the-Toyland-of-Andhra-Pradesh/article15453561.ece>), see a ray of hope in Modi's 'Mann Ki Baat' speech in which he had praised their efforts in keeping a tradition alive despite meagre returns. Lauding the revival efforts of the traditional artisan C.V. Raju of Etikoppaka in Visakhapatnam district, Modi said he wanted start-ups to promote the industry and secure the future of the artisans. He said that while the global toy industry is worth over ₹7 lakh crore, India's share in it is minimal despite its wide variety of traditional and unique toys. A back-of-the-envelope calculation by market players on the total annual business of wooden toy handicrafts in Etikoppaka, Kondapalli and Nirmal amounts to about ₹50 crore. This industry has tremendous potential and can provide employment to lakhs of people, according to market estimates.

Etikoppaka is a village on the banks of the Varaha river. Located about 65 km from the port city of Visakhapatnam, the village houses about 10,000 people. Over 200 traditional artisan families are part of the Etikoppaka toy-making industry in the village. The Etikoppaka signature toys include a standing couple, a wedding scene, automobiles, birds, and *sheshna* troupes. They are made with the soft variety of wood from the Ankudu tree. Like in Channampatna, here too artisans use only vegetable colours. "The soft-edged toys are useful for children. They help their eye-hand coordination, they help them recognise colours and enhance their motor skills. The industry also makes utility, decorative, ornamental and measurement utensils besides toys," says farmer and artisan Raju, 57.

In Etikoppaka and Kondapalli, the rich tradition of the handicraft needs a larger push, says Raju. He says he wrote to the Department of Science and Technology and the National

The Modi government has identified toy manufacturing, among 24 sectors, in which it will push domestic manufacturing and position India as an attractive manufacturing destination.

NECESSARY PROOFS

and Hasbro continue to be imported at high duty as similar products are not made in India. The growing demand for toys in India is fuelled by the rising disposable income. "But there has been a major shift from traditional and medium- to low-end but very-operated toys towards innovative electronic toys. Intelligent toys as well as upmarket, plush toys," says Dewan of SGEPC. For these toys, India is dependent on imports.

Hubs are now emerging in India to tap this rage. A toy manufacturing hub with an investment of Rs 5,000 crore is coming up in Koppal, Karnataka, while another has got the nod in the RICO industrial area at Kumbhara in Bhivadi, Rajasthan. These hubs offer financial incentives, efficient logistical network, integrated capabilities and flexibility in employment contracts, taking into consideration the seasonality of toy industry. "The allotment of land is complete, and we expect production to start in about one year," says Gurjan Krishna, director, Department of Industries & Commerce, Karnataka.

Uttar Pradesh is also planning to woo the toys. "The UP government will soon bring a toy policy and is in the process of developing a Toy City on Yamuna Expressway," says Navneet Sengal, additional chief secretary, Department of MSME & Export Promotion, UP.

The Madhya Pradesh government, too, has sprung into action following the PM's call. "We are going to hold toy manufacturing workshops by master craftsmen at our traditional toy-making hubs of Budhi, Sheopur and Rewa. Once the skill upgrade process is complete, we will focus on pushing exports of toys made in Madhya Pradesh," says Rajeev Sharma, commissioner, Handloom & Handicrafts, and MD of Madhya Pradesh Handloom & Handicraft Development Corporation. Mukhtar Abbas Naqvi, Union minister for minority affairs, offers an assurance to local artisans: "At least 25% of stalls will be for local toy makers in the upcoming Hunar Haats."

THE VOCAL FOR LOCAL
Etikoppaka is a village on the banks of the Varaha river. Located about 65 km from the port city of Visakhapatnam, the village houses about 10,000 people. Over 200 traditional artisan families are part of the Etikoppaka toy-making industry in the village. The Etikoppaka signature toys include a standing couple, a wedding scene, automobiles, birds, and *sheshna* troupes. They are made with the soft variety of wood from the Ankudu tree. Like in Channampatna, here too artisans use only vegetable colours. "The soft-edged toys are useful for children. They help their eye-hand coordination, they help them recognise colours and enhance their motor skills. The industry also makes utility, decorative, ornamental and measurement utensils besides toys," says farmer and artisan Raju, 57.

COVID and the craft
During the lockdown, the craftsmen struggled with unpaid inventory and e-commerce helped them. "We were not able to sell our toys in the market, but we started selling them online," says Raju. Archiving, documentation and design improvisation are the need of the hour, he adds. "Setting up an interpretation and design development centre would help in preserving this ancient craft," says the craftsman. PM Modi's call for making India the world's toy manufacturing hub as part of the 'vocal for local' slogan has given a thrust to the craftsmen, who are now hoping to get the mandated status of handicrafts and export incentives. "This is the pre-requisite for marketing the toys to the US and Europe," says Raju.



These toys are gradually making their mark in the market again. The local artisans of Etikoppaka are assisted by the School of Fine Arts, Andhra University, National Institute of Design, Ahmedabad and M.S. University, Baroda besides individual designers to come up with new designs.

KEY DEMANDS OF TOY INDUSTRY
Exempt small manufacturing units from mandatory BIS

Give incentives for existing units to shift to clusters

Give support to technology development centres at upcoming clusters

Single-window clearance

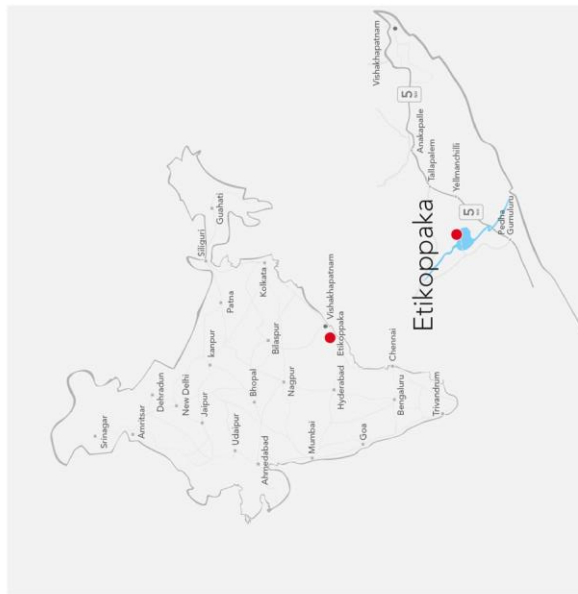
Cut customs duty on toy parts from existing 60%

Liberal labour laws

Plug & play facility for new toy manufacturers

Local toy makers need to be skilled to think global. Manu Gupta, convener, technical committee, Toy Association of India, and CEO of one of the largest toy makers Playgro, says lack of R&D, technology and innovation could stop India from achieving its new big goal. "We are

PLATE 3.2.7 NET STUDY -NECESSARY PROOFS ON THE PROPOSAL

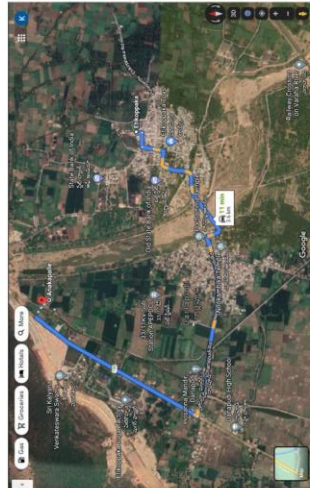


SPOTTED SITES IN AND AROUND ETIKKOPAKKA

MAP SHOWING THE DISTANCE FROM ONE SITE ALONG THE VARAHA RIVER TO ETIKOPPAKKA VILLAGE



MAP SHOWING THE DISTANCE FROM ONE SITE ABUTTING TO THE CHECK DAM TO ETIKTOPPAKKA VILLAGE



MAP SHOWING THE DISTANCE FROM ONE SITE OPPOSITE TO THE ANAKAPALLE ANJANEYA TEMPLE TO ETIKTOPPAKKA VILLAGE

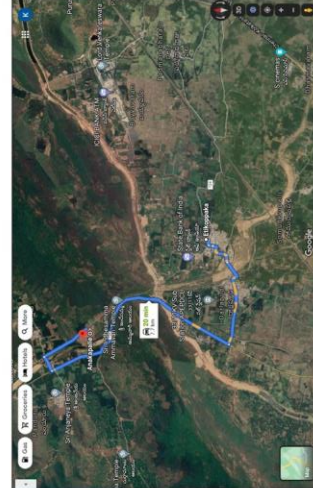
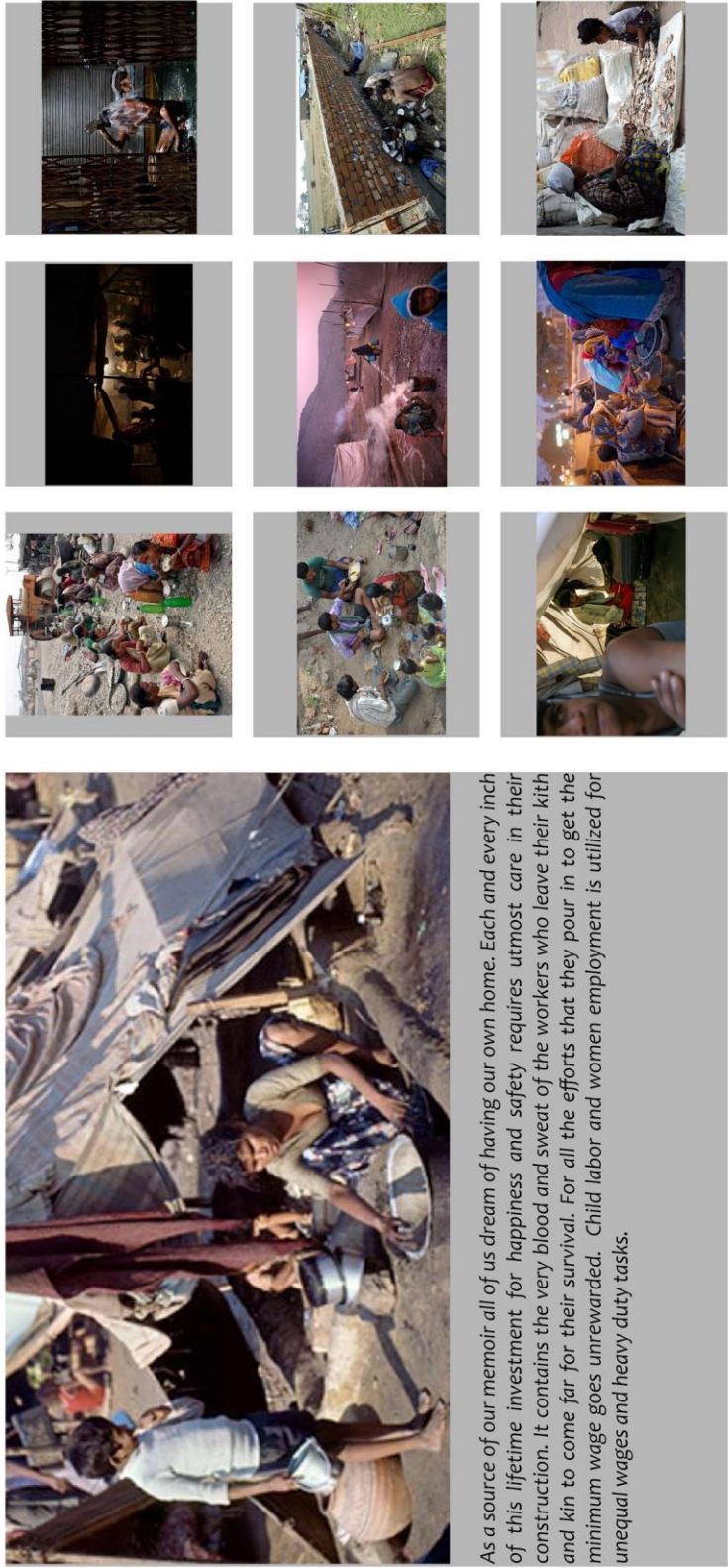


PLATE 3.2. 8 NET STUDY -LOCATING THE PLAUSSIBLE SITE



As a source of our memoir all of us dream of having our own home. Each and every inch of this lifetime investment for happiness and safety requires utmost care in their construction. It contains the very blood and sweat of the workers who leave their kith and kin to come far for their survival. For all the efforts that they pour in to get the minimum wage goes unrewarded. Child labor and women employment is utilized for unequal wages and heavy duty tasks.

PLATE 3.3. 1 NET STUDY - IDENTIFYING THE EXSISTINGPREDICAMENTS OF THE COMMUNITY

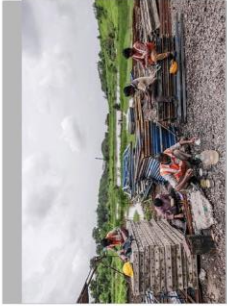
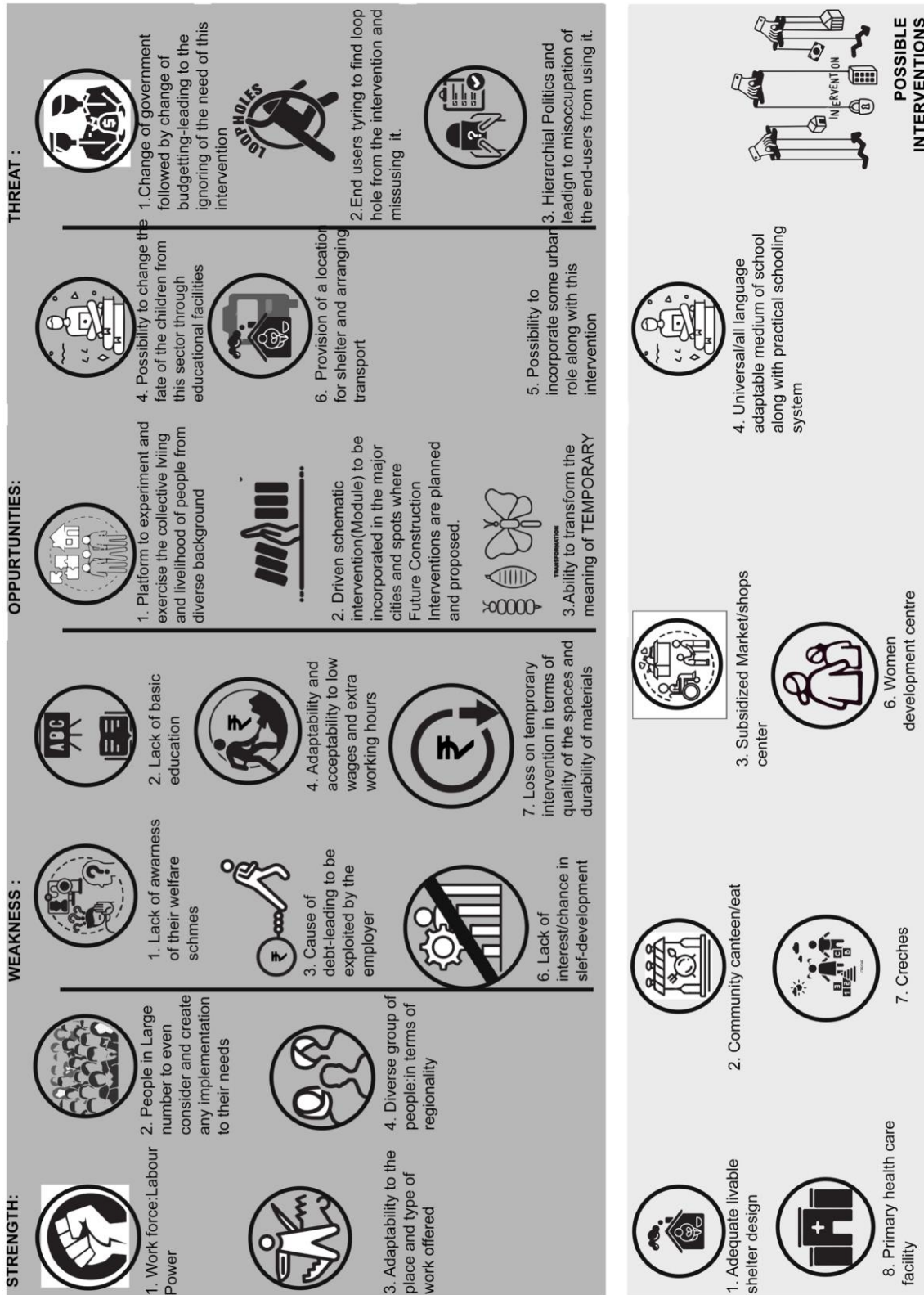
CONDITIONS OF THE WORKERS Their skills range from unskilled to skilled carpenters, masons and electricians. Over 70 per cent of them earn daily wages of over Rs 300. While workers from are paid between Rs 650 and Rs 700 a day by contractors, migrants are paid between Rs 500 and Rs 550. On an average, each migrant remits Rs 70,000 annually through banking channels. They work long hours, running up to 10 hours a day. IDENTIFIED ISSUE IN THE PROVISION OF SHELTER 1) Some characteristics evidenced in those contexts are arguably similar to those lived by internal migrants in the countries in this study. For instance, accommodation forms are often in bunker-like barracks, living conditions are precarious, there is little communication or integration with locals and workers' movements can be heavily constrained by security personnel. 2) "Gated labour camps" housing transient contract labour (on or off site) makes them "invisible" and "difficult to reach". 3. Labour camps restrict the spaces and motivations for engaging in collective action or forming social movements.	4. Labour camps housing transient migration contract construction workers in large-scale construction projects are not only dispersed (a direct result of construction being site specific in nature) but the security arrangements in place, render them both 'invisible' and 'hard-to-reach'. 5. They mainly lived in kacha house (73%). Most of them prepare their food in open place outside the house (surrounded by walls made by splitted bamboo mats and no ceiling/roof). About 23% subjects cooked their food in the living room. The 'invisible' and 'hard-to-reach' situation of transient contract construction labour, limits the efficacy of existing approaches by non-state actors, in improving their working and living conditions. This includes: the 'Decent Work Agenda' of the International Labour Organisation; the notion of shelter deprivations promulgated by UN-Habitat; and the critical work of 'collective organising' by civil-society actors. Electricity provision is less of an issue, as it is often needed before construction actually begins. Thus the provision of electricity for use by construction workers on-site only requires extension of the initial provision. Inadequate sanitation provision is problematic, and especially for women and accompanying children.	   	 1. With the schemes getting implemented, a far more better livable environment can be given to these people.  3. The systematic schooling which is adaptable in nature to allow the children to migrate with their family until a certain age, will empower the upcoming generation from this sector. 5. Possible allocation of locations with an understanding and perspective of the future of construction industry and locating the workers with proper livable colonies, ensuring the transport to and from the site can scale a huge difference on their livelihood and quality of living.	 2. Proper and affordable healthcare facilities will help in reducing their health complication.  4. The allowability of the mothers to leave their children in day-care facility/creche, will help their mental ability and presence in the construction site and also reduce accidents.  POSSIBILITY IN CHANGES IDENTIFIED
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PLATE 3.3. 2 NET STUDY -POSSIBILITIES IN CHANGES IDENTIFIED

JUSTIFICATION FOR THE SELECTION OF THE COMMUNITY  (i) Over 40 million people are employed in this sector. 			IDENTIFIED ISSUES  1. Lack of any decent shelter facility.  2. No water and sanitation facility in the places where they live  3. Children have no place for formal/informal quality education  4. Toddlers are also carried along with the mother to the construction site  5. No healthcare facility to address their health emergency or issue beyond the government hospitals of the locality with their stipulated timing.  6. Lack of planning and execution on the needs of these workers 		FINDINGS 1. From the analysis of Rural-Rural and Urban-Rural: the camps are more visible than those housing the Transient Migrant Contract Workers in Urban Project. 2. The provided accommodations are also like bunker barracks with poor quality of living. 3. There is a huge ignorance in considering the lifestyle and livelihood of these workers due to the "SHORT DURATION" and "FREQUENT SHIFT OF CONSTRUCTION SITES" mentality by the employers. 4. No contractors or employer holds the responsibility to provide social security to their workers in terms of Labour insurance, first aid facilities, restroom, drinking water availability, accidental benefits, canteens and pensions etc. 5. Most of the settlement lacks toilet facilities, water and cooking provisions. 6. The dependency of the workers to host on/around the site to avoid transport charges from the place of stay to the work site
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PLATE 3.3. 3 NET STUDY -JUSTIFICATION, IDENTIFICATION AND FINDINGS OF THE STUDY



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PLATE 3.3. 4 NET STUDY -SWOT ANALYSIS ON THE COMMUNITY

ABOUT THE INDUSTRY

There are about 14.6 million construction workers.

Construction absorbs about 9.8%; this is the second largest sector for inter-state migration after retail trade. Looked at stream-wise, about 42.6% of the rural-urban male migrants in construction are inter-state migrants.

Most of Construction workers are rural migrants either landless or very small land owners who come to the construction sites in search of work. Their characteristic like to come from poor families with low or no level of education.

Construction Industries which employs around 40 million people of unorganised sectors in India.

The rate at which these developments are being built comes at a cost; the construction industry thrives on exploitation of migrant construction workers and maintains a low standard of building construction

HIERARCHY IN WORKING

They identify three main branches within a construction company: **sub-contractors, technical (e.g., engineers) and personnel** (e.g., accounts).

Two categories are identified within the second, 'technical' branch: **these are skilled workers or Mistris, and the head Jamadars - those who supply labour** - who '[i]n practice, becomes the senior most officer on the worksite.

One labour camp serves as a 'home' to around 1000 migrant workers for a period of 2-3 years before the they move on to the next construction site. **The current generic solution of GI sheets as walls and roofing does not qualify as a thermally comfortable & sociologically adequate solution. We work with developers and contractors together to create change with humane dignified living condition.**

Due to space constraint, many male labourers prefer taking a bath in the open although there is no drainage line in place, leading to water accumulation nearby.

Under the labour laws, migrant construction workers are entitled to housing and other social security benefits apart from minimum wages, overtime charges and weekly offs. However, on ground, a very few planners implement and practice this clause of the law. Officials of the labour department often work in collusion with constructors. Because of this, there is no monitoring authority to stop this practice.

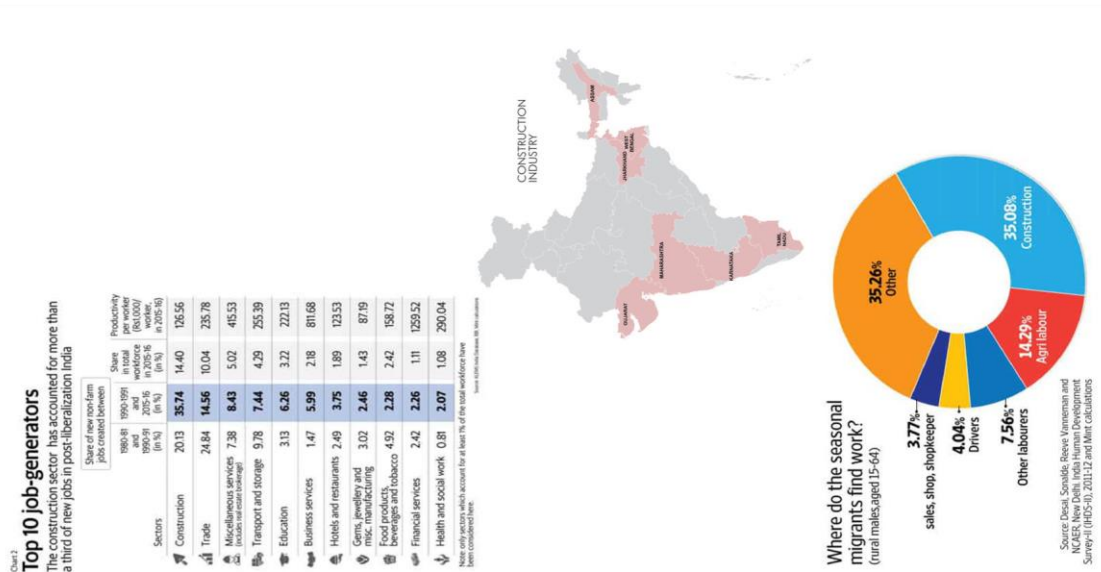
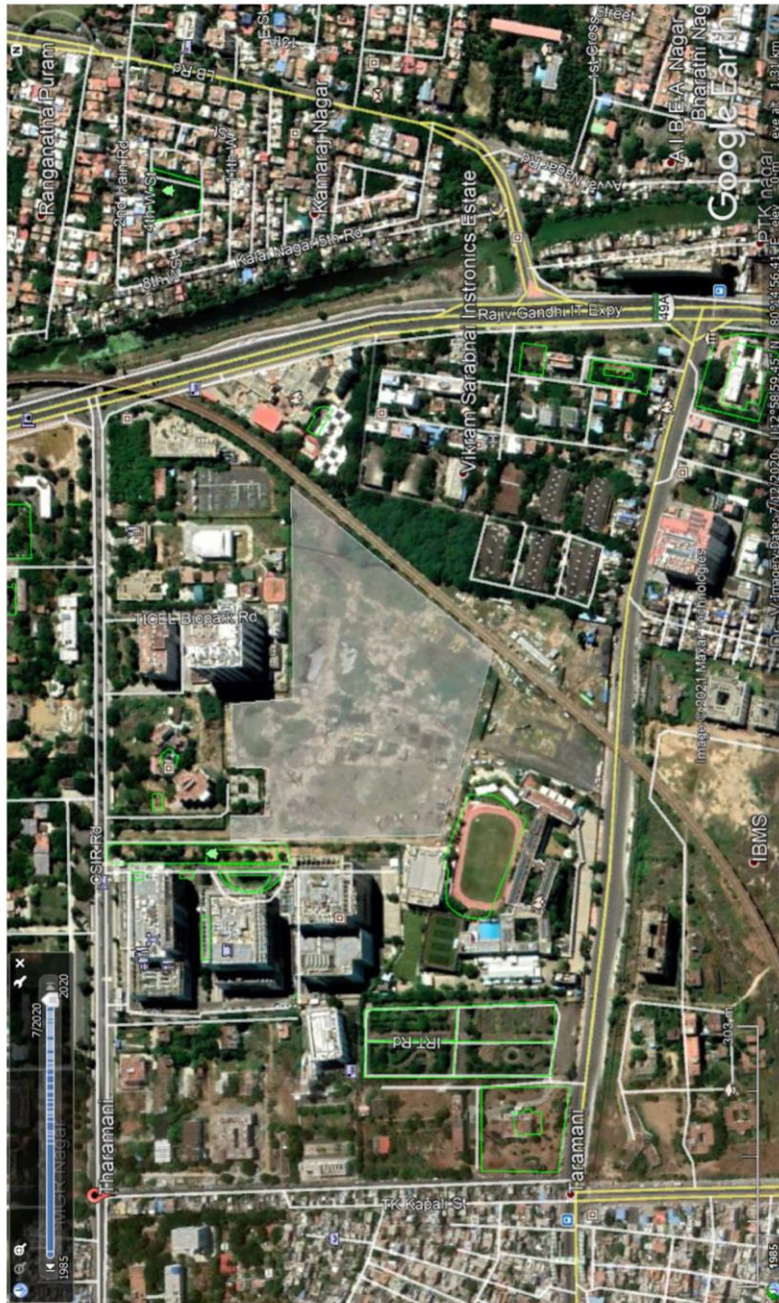


PLATE 3.3. 5 NET STUDY -INDUSTRIAL BACKGROUND AND WORKING HIERARCHY

CASE IN TAMIL NADU Tamil Nadu is home to more than a million migrant workers, a government-commissioned survey has found. The just-concluded survey conducted by a private consultant on behalf of the state labour department shows that a majority of the 10.67 lakh migrant workers in the state are unskilled workers. About 27% are employed in the manufacturing sector, 14% in textile industries and 11.41% in the construction sector. The numbers may be under-reported, say social workers, but the data will help them get healthcare and other benefits. TN draw workers from West Bengal, Odisha, Bihar, Jharkhand and Assam.	It does not appear to have covered all the migrant population in the state. The number of workers in the construction sector must be more,” she said. There have been several complaints from migrant labours on delay and non-payment of wages. “It’s unfortunate that most children of migrant workers do not get formal education. AT CHENNAI Nearly 2,800 migrant workers, employed to carry out construction for the Chennai Metro and other private constructions happening in the city. IDENTIFIED ZONES 1. North Chennai (Ennore and Minjur-Kattupalli), 2. West Chennai (Sriperumbudur-Oragadam, Chennakuppam) and 3. South Chennai.	CONDITIONS AT CHENNAI Most workers get paid anywhere between 250 – 700 per day of work depending on the industry and the season. They work about 12 hours a day. Social Experience of Migrants & Migrant Communities Migrants are looked at with high skepticism by rest of the society. This becomes a great challenge when looking for a house in a predominantly non migrant areas. There are traditional stereotypes that people are unable to look beyond. But things are also changing for the good in the recent decade . Government Support for Migrants in Chennai Under fire for various Non Governmental Organizations for the abysmal conditions of migrant workers, the Government of Tamilnadu had earlier planned to set up a resource center for the assistance of migrant workers. As part of the initial work in collaboration with Tamil Nadu Institute of Labour Studies Under the Building and Other Construction Workers Welfare Board, a cess at the rate of 1% of the construction cost incurred is collected across all the Tamilnadu Government projects . This money is used for the providing support to workers. 3 major boards are created under the Labour Commissioner: TN Labour Welfare Board, TN Construction Workers Welfare and Board TN Manual Workers Welfare Board.
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PLATE 3.3. 6 NET STUDY -IDENTIFIED ZONES AND PREVAILING CONDITION OF THE COMMUNITY



SITE AT THARAMANI, CHENNAI

PLATE 3.3. 7 NET STUDY -SITE AND SITE CONTEXT

3.4 FIRECRACKER WORKS, SIVAKASI

3.4.1.1 UNDERSTANDING THE INDUSTRY

Sivakasi, also known as KUTTI JAPAN, the fireworks hub in Virudhunaga district, about 544km from Chennai. The economy of Sivakasi is dependent on three major industries: firecrackers, matchbox making, and printing. The townscape is dotted with numerous fireworks factories - over 2,000, in addition to around 1,000 illegal units, employing an estimated four lakh people - inside which women could be seen furiously rolling cardboard paper into cubes and tubes while men, coated in aluminium dust, fill those tubes with a mix of chemicals like potassium nitrate and sulphur. The town is the nodal center for firecrackers produce at the national level.

3.4.1.2 BIRTH OF THE CRACKER HUB

The story goes down to 1922, where two brothers from the Nadar community - P Ayya and A Shanmuga - travelled to Calcutta to work in the matchbox industry. These brothers later established “the South India Lucifer Match industry by cracking the chemical.

The dry weather and a high number of jobless people only helped them expand the industry. Soon, many others from the Nadar community in Tirunelveli and Nagercoil regions migrated and settled in and around Sivakasi, setting up cottage industries, making matchsticks.

However, the growth of the firecracker industry led to other industries getting diminished. The printing industry employs a few hundred people, but even this industry is largely dependent on the fireworks factories since it produces wrappers, labels and boxes for crackers.

3.4.1.3 UNHEARD VOICES OF THE VICTIMS

The town, fondly called Little Japan by Jawaharlal Nehru, has around 800 factories involved in making fireworks. As Diwali, the Hindu festival of lights usually celebrated in October/November, approaches, all factories in Sivakasi go on a production overdrive. Caution is thrown to the wind, making it a most dangerous job. Human right violations and labour safety laws flouted are commonplace and the factories are notoriously out of bounds for journalists and photographers. Not that the locals have many options.

Lack of proper safety measures and overburdening workers with tight deadlines causes many accidents in the factories. Most accidents go unreported, but it is said that about 100-150 people roughly get injured a year on average in fire

accidents. Deaths are not unheard of either. Children who lose their parents in fire accidents take the same job and the vicious circle continues.

3.4.1.4 LAID TRAPS TO THE PEOPLE

There is a guaranteed job in the hands of the workers for 10 months in a year. The man power support for the factory works are high as the people are subtly put into the vicious notion of the employer – employee welfare as the city/ town run under the support of such owners and they seem to provide shelter (small sized single room units for families), schools for children, transportation to and from the factory in their funding. This ultimately creates a sense of notions that the life is sorted if and when a person's basic needs are taken care. What is even more toxic is the mind-set of the people, where they claim it as an advantage to work in these factories which gives them the surety of job, and a lump sum amount of casualty of death during fire accidents. Though there are many schools funded and run by these group of factory owners.

Many schools are run by the fireworks factories, yet the pass percentage of this town has never seen any improvement and this town especially has a lot of school dropouts in account.

Through the focus group discussions and questionnaire, the people of this town aim and aspire only to the very basic essentials as their luxury which in turn also hits their level of exposure and aspiration due to which they seem to still live in a contented life managing a livelihood in 5000 rupees per month.

Once and after a bread winner passes away, the rest of the family are put in a situation to perceive the same job to fill their stomach.



JUSTIFICATION

The economy of Sivakasi is dependent on three major industries: firecrackers, matchbox making, and printing. The town has 520 registered printing industries, 53 match factories, 32 chemical factories, seven soda factories, four flour mills and two rice and oil mills. The town is the nodal center for firecrackers produce at the national level.

The major issues in the fireworks industry in Sivakasi is child labor, poor wages, pathetic condition of the employee, the inability of the labors to understand the life outside, frequent accidents.

The common reasons cited for the accidents are inadequate training of workers and supervisors involved in different stages of production and marketing of firecracker items. Other reasons are found to be overstocking of explosives, raw material and finished goods, and employment of workers in excess of the permitted strength.

There are more than 1071 fireworks factories employing eight lakh people, half of which is illegal and employs kids for dangerous jobs.



PLATE 3.4. 1 NET STUDY -JUSTIFICATION AND EXISTING CRISIS IN THE COMMUNITY



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PLATE 3.4.1. 2 COMMUNITY VISUALS
3.5 COMPARITIVE ANALYSIS OF THE COMMUNITY STUDIES

COHERRENT ANALYSIS ON THE PLAUSIBLE WORKABILITY OF THE PROJECTS INORDER TO NARRROW IT TO ONE.

With the case of construction workers, the location of a real time possible site was not easy to analyse in the give slot of time and is still not involved mandatorily in our scheme to house them, yet at the same time we forget that they create our shelter and help us lead a better life.

In case of the Toy Makers, the plausible site is still yet to be fixed by the government and in facing the funding stage currently. Thus, taking this forward for my architectural thesis will seem to be working on a current issue on an hypothetical site and carrying other complications once and when I try to perceive it be as a proposal for the same cause.

The following table discloses the closely observed nuances that let to justify on taking over one study area to be worked on as architectural thesis after paying the visit to TIRUNELVELI AND SIVAKASI.

	BEEDI WORKES, TIRUNELVELLI	FIREWORKS WORKERS, SIVAKASI
WORK SCHEDULE	(i) 13-16Hrs of work(repetitive) is tedious and exhausting (ii) Possible for 12 months round the colock work (iii) Flexible work environment as it is carried from their home/place of living. (iv) Less income fromt he work done and time invested (v) Pressure of compliting minimum 500 nos. of beedi	(i) 10 months sure shot working. (ii) 2 Months after diwalli (leave w/o wages) (iii) Frequent suspension due to fire accidents around the city(leaving no wages)

TABLE 3.5 COMPARITIVE ANALYSIS OF THE FIREWORK COMMUNITIES

RISK IN THE WORK	(i) Same and uncomfortable body posture in the long hours of work leading to permanent body issues. (ii) Women following the same posture causes cervical cancer (indicator). (iii) Usage of same space to live and to work slowly causing the toxicity in the body, further leading to respiratory issues. (iv) ID cards are issued and still large number of people are not registered. (v) The economic demand on the family with respect to the economic demand of the Town (Locality) is manageable with monthly income of 5000 rupees. (vi) Proper accessibility of the health facilities ensured from the government side. (vii) Registered workers get 10% of bonus and leave salary in some registered companies.	1. Least distraction and slippage can cause huge disaster. 2. Smoking and alcoholism during work leads to calamities with serious consequences. 3. Inadequate fire technology to prevent the fire at the fire stage growing. 4. Lack of awareness and seriousness amongst the workers. 5. No valid government identity cards are seen yet all the schemes reach the labours. 6. The manpower demand at Sivakasi is quite low on rent basis, around Rs. 600 - Rs. 2000. 7. Many schools are run by the fire works company themselves including 5 engineering and 3 arts-science colleges within the town, yet the number of dropouts from school are increasing. 8. Sivakasi held its roots for child labour during the early stages of growth in the industry, it has come under limelight that though child labour is no more a light subject. But that hasn't stopped kids from being lured into these due to the attractive sum they receive rather than the education they deserve. 9. Around 3 municipal parks and playgrounds are available to the residents in central town, yet the public aren't aware of the potential use of such spots. 10. At times of emergency it takes 20 - 30 minutes for fire engines to arrive due to poor connectivity. Availability and ease of access of ambulance and other emergency care has to be greatly improved given the nature of work adopted by a majority of the population in the region. 11. Absence of PPEs to protect themselves from chronic diseases and from the exposure to ultra fine particles that might enter the respiratory units. 12. Lack of proper knowledge to adapt a drill during accidents leading to loss of life. 13. Improper installation or lack of necessary equipments to ward off fire at its nascent stage.
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TABLE 3.5 COMPARITIVE ANALYSIS OF THE FIREWORK COMMUNITIES

OBSERVATION FROM THE VISIT	(i) Workers anticipating and are ready to swap the household job from BEEDI ROLLING (ii) Current generation is not interested in this occupation. (iii) Most of the worker's children are put up in school and taking up education. (iv) The laid hospital units take up serious cases and often the out patients and accumulated. (v) Many welfare groups are focusing on the aspiration occupation chosen from the people and are aiding and supporting them in their career yet is in very small number when compared to the total population in this sector of work. (vi) More to mear- families reside in own houses which lessens the money demand considerably. (vii) The area holds a rich context and buildings from the past. (viii) Area is also rich with flora and fauna. (ix) There is a directional aspiration observation in the current generation of people. (x) Sector begun with both male and female workers, now predominant female role in the industry. (xi) Lack of rehabilitation and self awareness on the job.	(i) Stubborn attitude in not able to accept life/livelihood beyond firecracker works and allied jobs. (ii) Dominance of accepted lack of exposure. (iii) Predominant accepted attitude towards the current quality of living. (iv) Incapability to be inspired/aspired (v) Prevalence of digitalisation yet unaware to expand the usage of tool for self development/ growth. (vi) Adamancy in major children in choosing job/work over education (vii) Inability to imagine and aspire better living conditions. (viii) Adults acceptance to the job fully because of the surity in Money/PF after their death in service and factory accidents. (ix) Infrastructure at the town centre: Not aspiring. Incapable of handling floating population. (x) Open sewage system throughout the town. (xi) Many public toilets implemented in the town yet the quality in terms of sanitation is a questionmark. (xii) Presence of grounds yet restricted usage based on the ownership. (xiii) No prevailing sports drive the youngsters of the town. (xiv) No villagers to storytell about the Town's history and formation. (xv) Workaholic population (xvi) Greed of extra profit during summer-heat lead to accidents. (xvii) Due to insufficient groundwater, agriculture is less practiced.

TABLE 3.5 COMPARITIVE ANALYSIS OF THE FIREWORK COMMUNITIES

From the above analysis it was very evident to see how people are exploited and made to viciously fall in this toxic circle for generation together.

“...if design is merely an inducement to consume, then we must reject design; if architecture is merely the codifying of bourgeois model of ownership and society,

then we must reject architecture; if architecture and town planning is merely the formalization of present unjust social divisions, then we must reject town planning and its cities...until all design activities are aimed towards meeting primary needs. Until then, design must disappear. We can live without architecture..." - Adolfo Natalini, Superstudio (1971) quoted at: <http://en.wikipedia.org/wiki/Superstudio>

Thus, on paying respect and focus to the people's primary needs and holding a vision of interest in establishing the wellbeing and dignity through architecture, the final architectural thesis takes up FIRECRACKER WORKER'S OF SIVAKASI as the context of study and end user group for the thesis program to render and serve their needs.

CHAPTER 4 SELECTION OF COMMUNITY AND SITE CONTEXT

4.1 TIMELINE OF SIVAKASI/HISTORY AND MORPHOLOGY OF SIVAKASI

The town is located in Virudhunagar district of the South Indian state, Tamil Nadu, at a distance of 74 km from Madurai. Sivakasi is located to the east of Western Ghats and to the west of Sattur.

The sulphurous land of Sivakasi, which accounts for 90% of India's total fireworks production, 80% of all safety matches and 60% of total offset printing solutions. The town is the nodal center for firecracker manufacturing at the national level. The Annual fireworks manufacturing is valued at Rs 3,000 crore. Approximately 70% of the firecrackers and matches produced in India are from Sivakasi. The hot and dry climate of the town is conducive to the firecracker and matchbox making industries.

4.1.1 HISTORY

During 1428 to 1460, the then Pandya King Harikesari Parikarama Pandiyan found the town with Shiva Lingam from Kasi. In 1736, when Madurai became independent of the Vijayanagar empire, it was ruled by the the Nayaks for over 2 centuries who also improved the temple and retained is cultural context. Several captures later Madurai was under British Raj. Annexed to the Madras and the Nadars led Sivakasi riots. Later Sivakasi Municipality was formed in 1920. In 1998, Madras becomes Tamil Nadu and Sivakasi becomes 1st grade municipality and later to selection grade municipality.

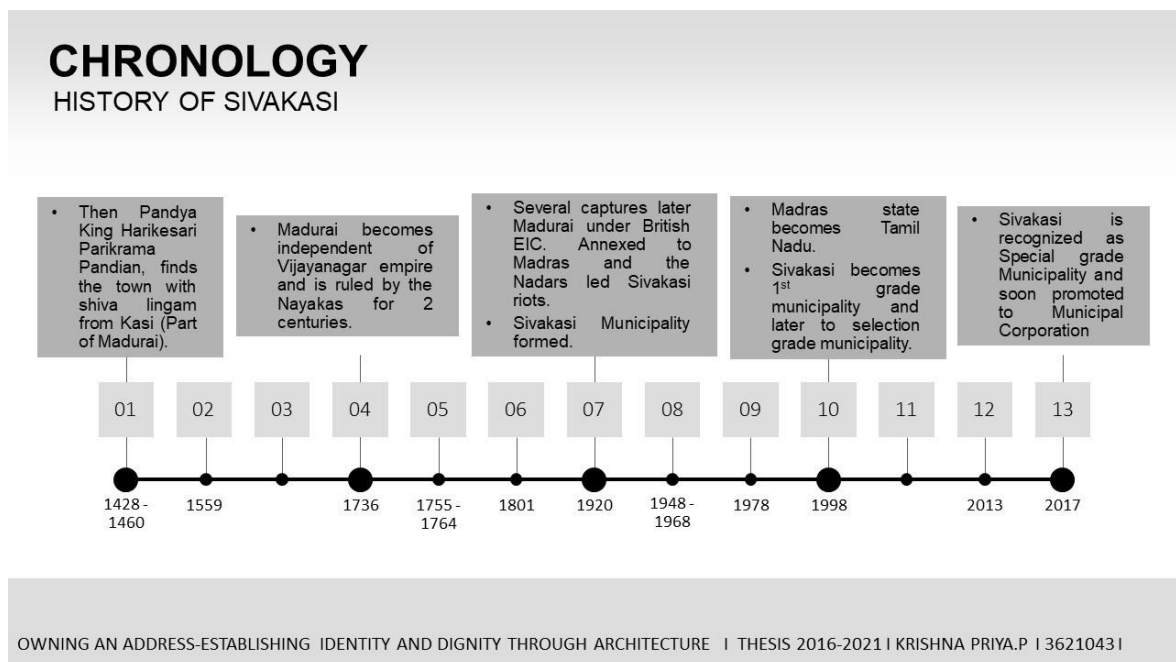


PLATE 4.1. 1 CHRONOLOGY OF SIVAKASI

4.1.2 SIVAKASI AND FIRE CRACKER INDUSTRY

As fireworks paint rainbows in the sky, the town of Sivakasi in Tamil Nadu drowns in shades of grey

Earlier, Calcutta was the main hub as chemicals and metals unloaded at its port from European countries encouraged a small-scale industry of Bengal lights and fireworks for festive and religious occasions. The first tubris (flowerpots) were fashioned out of mud and inter-street tubri competitions are held in Bengal even today! But production of fireworks was restricted by the British due to fear of anarchist activities.

Around the same time, Sivakasi was reeling under drought and famine, forcing two enterprising cousins, A Shanmuga Nadar and P Ayya Nadar, to head for Calcutta in search of better prospects. There, they stumbled upon the Japanese match factory next to their lodge. After learning the craft for eight months, they returned to Sivakasi and established a factory with raw material and machines imported from Germany. When mechanized production proved costly, they adopted Gandhiji's swadeshi mantra and call for cottage industries. The brothers switched to manual production using cheap local labour and set up individual factories in 1926 – Kaka Match Industries and Anil Match Factory, with crow and squirrel as their symbols.

The following sheet spreads the industrial chronological growth of Sivakasi

CHRONOLOGY

INDUSTRIAL GROWTH OF SIVAKASI

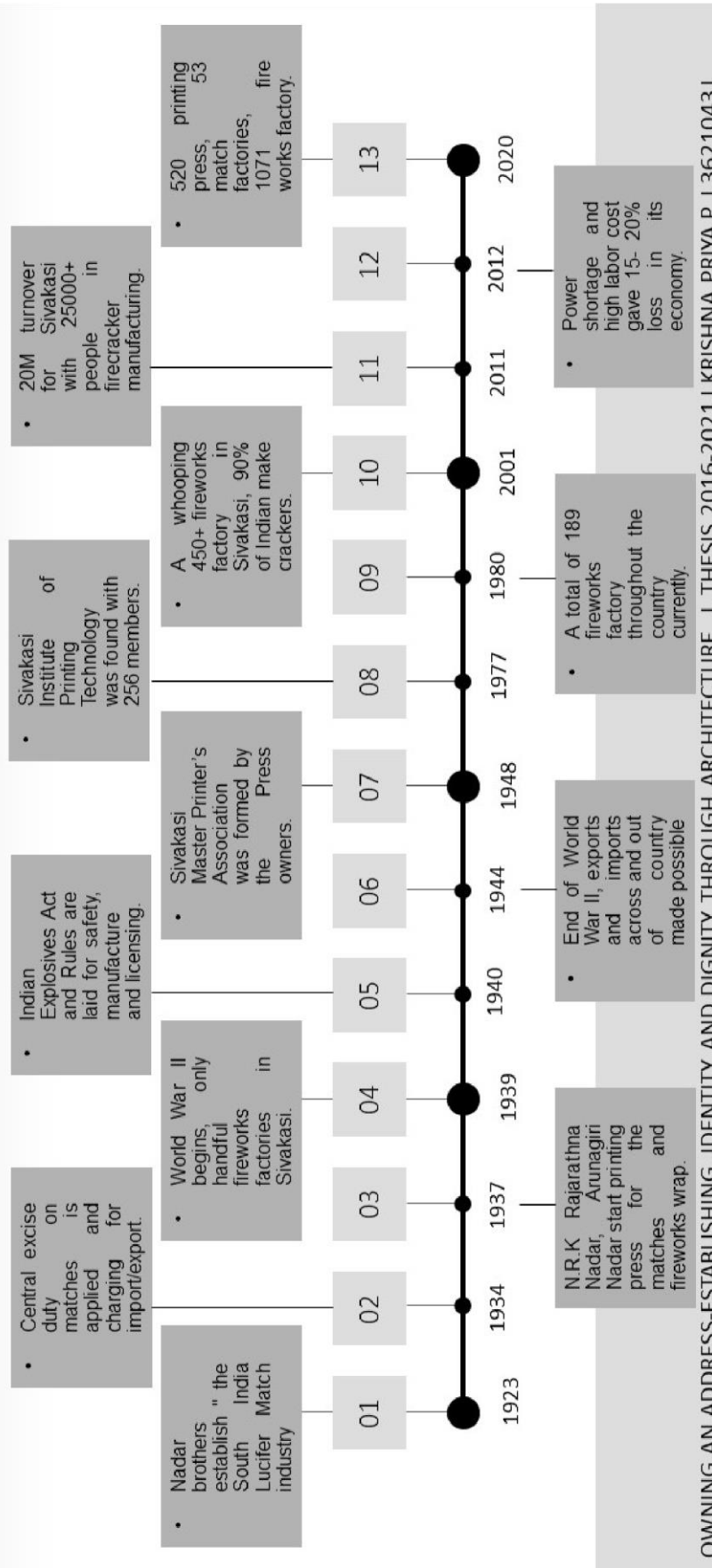


PLATE 4.1. 2 INDUSTRIAL GROWTH OF SIVAKASI

4.1.3 EXPLORATION OF PROBLEMS

As fireworks paint rainbows in the sky, the town of Sivakasi in Tamil Nadu drowns in shades of grey

Though the city seems to be rich in culture and economy, it is still a one sided story to the whole picture. The entire reason behind this thesis is to establish identity through architecture. Now, when things all seem fine until here, there is a huge infact major population of the town that helps their town be called rich and settled. These are the people who work and sweat out at factories. Irrespective of men and women, even children are viciously involved in the cracker making industry by creating an illusion where, their basic essentials are covered if they are ready to work for the factory. This in turn attracts the people and traps them in a noxious way, where people tend to risk their life on a day to day basis and this is the only town which equates, human error to death.

Further, there is a manipulative claim that Sivakasi is apt for such industry with its dry climate. This actually seems like the natural layout of the town, its soil, water and climatic conditions of the town has crafted the incapability to practice agriculture thereby making them depend on the match making, fireworks crafting, press setting majorly.

All this is still persisting as the roots of the people are completely manipulated for these owner's good. Many schools are funded and run by these owners yet we still see a large percentage of school dropouts in this town specifically. Children work from homes as contract labour making the paper cones that are later stuffed with chemicals to make fireworks. This certainly is the major factor for the plight that the town is facing in circles.

4.1.4 HUMAN ERROR EQUATING TO INSTANT DEATH.

Those who work in the industry have been engaged in this business for generations. Yet, the lives of the people have not changed much. Almost every family has a painful story to tell, an unhealed scar to show - a burnt hand, a blown-off limb, a dead father, a son blown off into pieces. Deadly accidents involving fireworks are common here.

In some of the biggest factory fires, about 40 people died in 2009, 30 in 2001 and more than 60 in 1991. The list of casualties in smaller mishaps is much longer. But more than 700,000 workers of Sivakasi have no other option but to depend on one of the most hazardous industries for their livelihood.

About 20-25 workers die each year in fire accidents in this industry which boasts of an estimated annual turnover of more than \$365m (£225m). (<https://www.bbc.com/news/world-asia-india-19596089>)

The hospital has a shortage of staff and equipment and has no supply of morphine, the standard pain relief drug for burn victims.

Workers are expected to learn intricate procedures like mixing chemicals and explosives on the job.

Beyond all this, this industry continue to be the lifeline to the people to lead their life in the town.

The following is the timeline of Fire Accidents since 2009

Fire accidents in Sivakasi

- 
- A vertical timeline with a dashed line and circular markers on the left side, listing fire accidents in Sivakasi. Each entry includes a date, a bolded date header, and a description of the incident.
- July 20, 2009**
18 people killed after crackers went off at Sri Krishna Fireworks in Namaskarithanpatti village
 - July 28, 2009**
Three workers killed in a fire accident at Anil Fireworks in Keezha Tiruthangal village
 - August 3, 2009**
One died in a mishap at Classic Fireworks in Meenampatti village
 - September 5, 2012**
52 people burnt to death at Om Sakthi Fireworks in Mudhalaipatti village
 - May 15, 2013**
19 people charred to death at Meenakshi Fireworks in Kichanayakkanpatti village
 - March 11, 2019**
Five workers killed in cracker blast at Nagamalli Fireworks in Vetrilai Oorani
 - April 6, 2018**
Four people died in two different fire accidents at Ramuthevanpatti and Kakkivadanpatti villages
 - September 8, 2018**
Three people deployed at Krishnasamy industries in Kakkivadanpatti died in accidental firecracker explosion
 - October 11, 2019**
One person working at Sri Ravindra Fireworks died while mixing chemicals at Alamarathupatti village

PLATE 4.1. 3 TIMELINE OF FIRE ACCIDENTS IN SIVAKASI

Fire accidents in Sivakasi

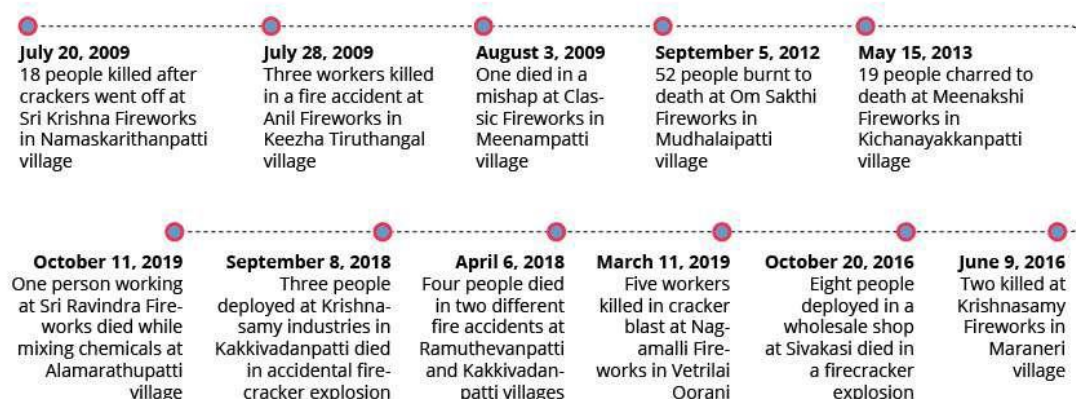


PLATE 4.1. 4 TIMELINE OF FATALITIES DURING SIVAKASI FIRE ACCIDENTS

4.1.5 WORKING CONDITIONS/ENVIRONMENT OF THE WORKER Vs QUALITY OF LIFE

The 10×10 sqft rooms that men and women work together - from dawn to dusk, in sickness and health, in life and death to produce an array of firecrackers that illuminate the Diwali skies across India.

The cramped working conditions are clearly detrimental to the people's health and mental state. Since, the work involves a lot of combustible materials, right from papers to chemicals, most factories do not have windows for these rooms and electricity connection to avoid any fire accident.

The workers are adversely affected by unrealistic schedules, unfair wages, extended working times, forced overtime work, late arrival of materials for production, erratic reshuffling of work schedules, congested work places, low levels of autonomy in their jobs, lack of managerial expertise and provisions to solve their problems etc; which are all closely related to the quality of their work life.

The Quality of Work Life can be affected due to many issues such as working conditions, workers health, improper social welfare measures, extended working hours, compulsory overtime, quality of life and the quality of work which are not yet addressed well etc increased stress level of the workers at their job and lead to job dissatisfaction in the study area.

Firework plays a crucial role in the promotion and development of economy for the town and it is one of the explosive industries. The production of fireworks products is manual one, and labour is an important factor of production in the fireworks industry. Fireworks industries are mainly employing skilled, semiskilled and

unskilled workers; those who are neither educationally qualified nor technically experienced.

Majority of the workers of these industries feels that their industry are not providing adequate measures to balance their work and personal life and thereby struggling to provide a congenial climate for the workers to attain the quality of work life.

The basic necessities like drinking water, proper wash area, eating space, ventilation, sanitation facilities seems like a luxury to them. Although they are the people who put their hands and life at risk to fetch the turnover for the industry, they are treated like a slave and exploited profoundly.

Being a hazardous industry (explosive), life at risk is a fundamental complication that it develops and these factories are still witnessed with just water and sand buckets all over the working surroundings. In order to contain the fire in case of a mishappen, just a blast wall and safety distance is what the factories are still holding on to and there seem to be no regular fire drill workshops conducted anywhere.

4.1.6 PLOTTED TRAP

The Nadars, who own most of the match and fireworks factories, were among the lowest castes in the district; today, however, they rank economically far higher than the land-owning Vellala, Naicker, Reddiar and Maravar communities.

A major reason for the Nadar community's cohesion is the Nadar Mahayana Sangam, formed in 1910, which has master-minded the social, economic and intellectual development of the community.

The Sangam has founded schools, colleges, cooperative banks and has a virtual monopoly in foodgrain and grocery distribution in the region. Today, the Nadars' empire extends over 730 small-scale and 1,330 cottage units in the match and fireworks industries. They also control the lucrative Sivakasi litho printing industry, which turns out everything from match labels and calendars to posters and books.

The British evolved a plan in 1937 to solve Ramanathapuram's acute water-shortage, which involved the construction of the Keerayan Alagar Dam in the Western Ghats to irrigate 3.5 lakh acres of land in the drought-prone district. Since Independence, the plan has been reviewed five times, but no dam has been built.

“Child labour continues in the district because drought and lack of employment forces parents to send their children to work. There is also a strategy on the part of the state Government not to develop this area. Ultimately, children cannot be organised, so child labour favours the employers.”(<https://www.indiatoday.in/magazine/special-report/story/19830115-sivakasi-houses-worlds-largest-concentration-of-child-labour-in-its-industrial-units-770353-2013-07-30>)

4.1.7 ITCHING THOUGHTS FROM THE OBSERVATION SO FAR

When there is no respect to the mere life of people, this place is a living hell where people wake up expecting to die at any point and their lives reflect how one could live with a ticking bomb. This context increases my adrenaline when I see humanity beaten and buried in depth. To treat any living being with respect for life forms the basis of our being, if that is lost, then we cannot see any dignity in living or letting another live.

“Only when millions of people all over the country light a match, buy crackers for Diwali, or read small news items about a few children dying in accidents, does Sivakasi flash briefly on their subconscious.”

4.2 MACRO ANALYSIS OF THE CONTEXT FABRIC OF SIVAKASI

The following topic explores the mapping, morphology and analysis of the day to day activities and topics of that help correlate and develop a holistic perspective towards framing the program.

4.2.1 LANDUSE MAPPING

The mapping of the settlement pattern through identifying the existing and pre-existing settlement based on the typology of built space enable in analysing the flow of the town, dominance and hierarchy along with the a plausible understanding on visioning its mere existence.

Here 1989,1999 and 2021 land use maps are created and studied from which it was very evident to see the radial sprawl of the city from its central business node towards its periphery. There has been a persistent growth in as the boundary of the town kept increasing

It was evident to place the argument on the fire safety at the town centre there is a mixed land use pattern observed from the 2000 before which it was purely commercial. Now, in order to support and aid the floating population, the centre of the town has to dilute and give space for other buildings like lodging, restaurants, other shops etc.

This puts many life in danger as most of the commerce here is for the firecracker trade and such retail shops having the sample piece in store in a mixed use building settle threatens many other user groups unnecessarily.

The land use also helped to map the institutional buildings especially the government office that forms a diagonal access and also the concentrated location of many hospitals towards the centre. The residential area is widely spread at the periphery ensuring a safety distance from the industrial set ups.

Around these residential area many educational buildings are located for the ease of movement of the children.

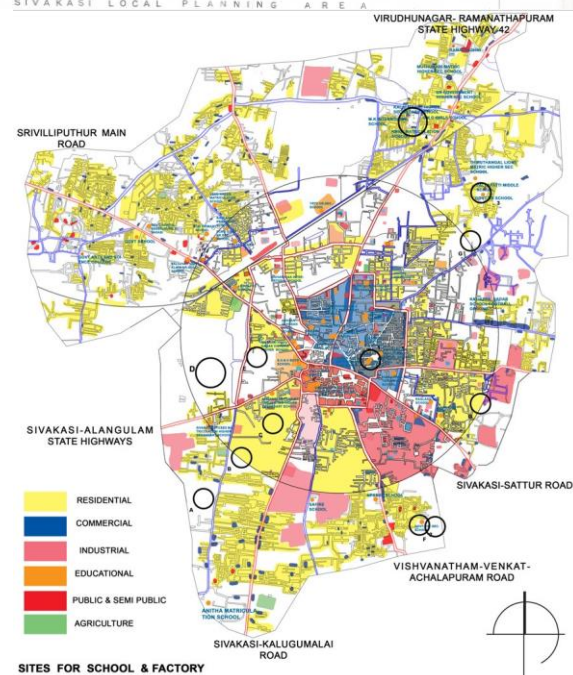
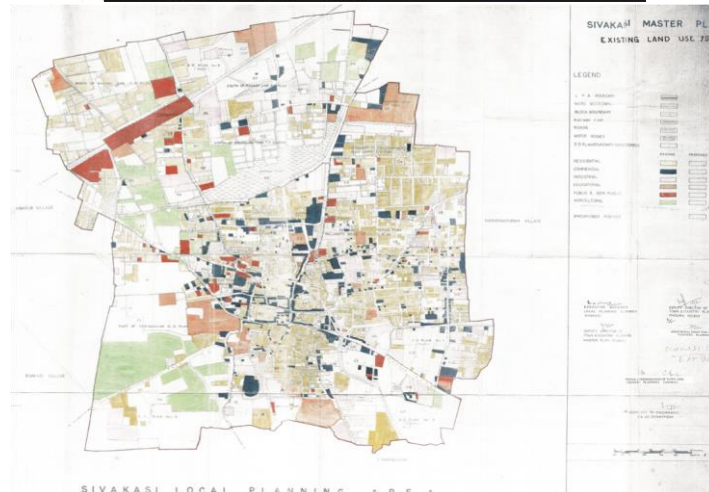
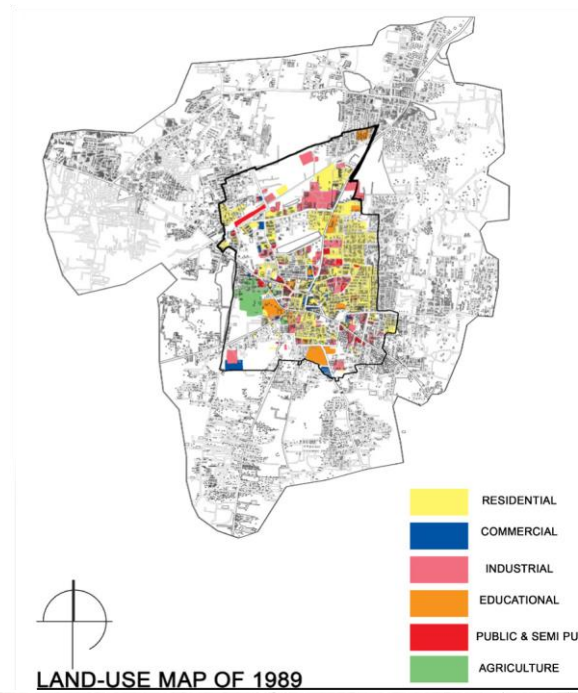


PLATE 4.2. 1 NET STUDY -LANDUSE MAP OF SIVAKASI

4.2.2 FIGURE AND GROUND

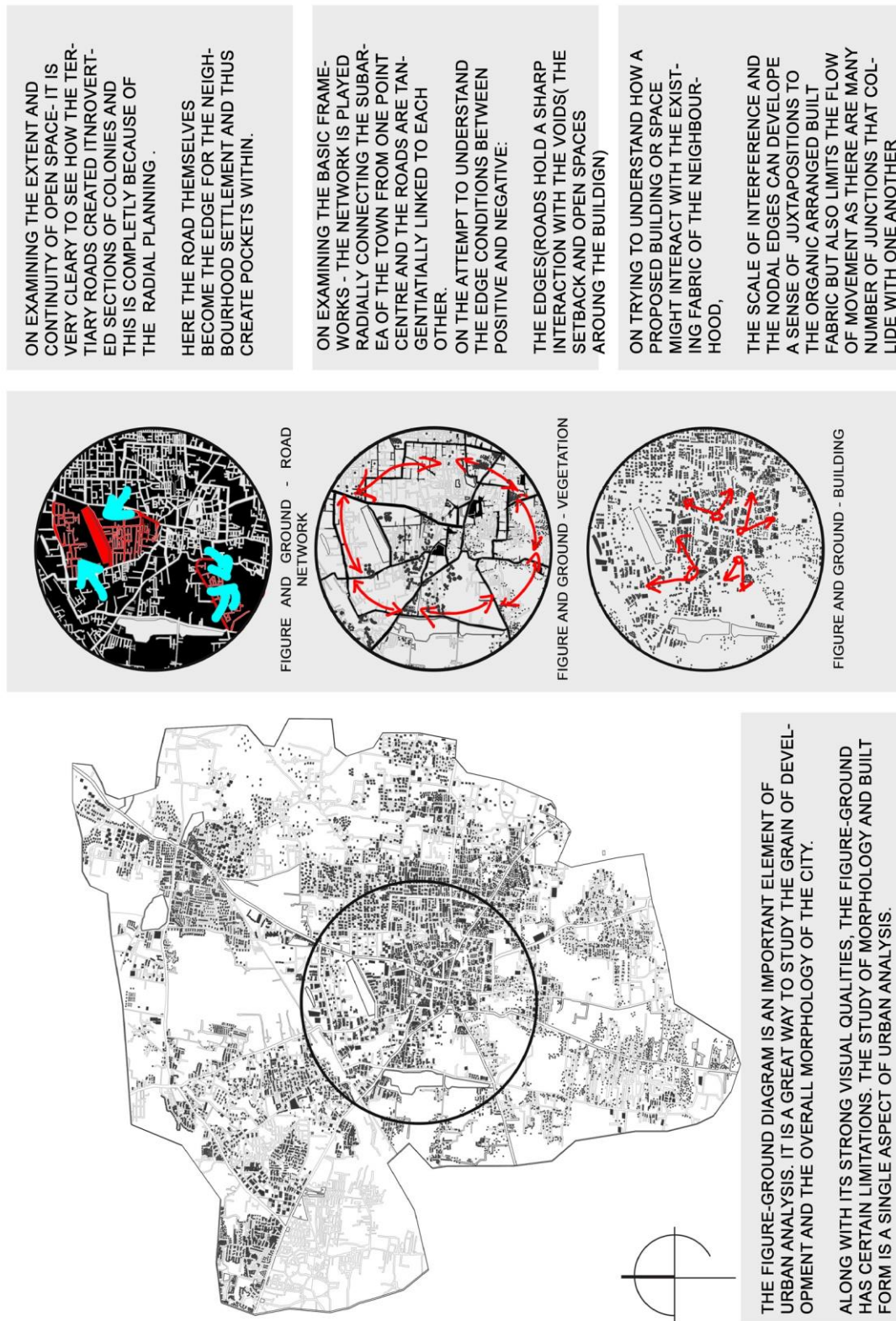


PLATE 4.2. 2 NET STUDY -FIGURE GROUND MAP OF SIVAKASI

4.2.3 INSTITUTIONAL BUILDING MAPPING



J. Lazer, Sivakasi Unit Secretary for Centre of Indian Trade Unions(CITU) quotes that flower pots and chakras are made at home illegally in interior parts of the village by children.

The flower pot filling, wrapping, sealing etc are made to be carried out by children.

According to 1991 census number of children between the age groups 6-14 yrs employed in this industry in Sivakasi accounts to about 30,000.

This number was further revised by A State Government Study sponsored by UN Children's Fund to 33,000 (30,000 in Match industry + 3000 in firecrackers unit)

A majority of this number accounts for the illegal manufacturers and units. These illegal units hide the blankets of the cottage industry and work underground.

No law so far has been able to eradicate this practice effectively.

Children are pushed into a "all work no play" situation, sabotaging their ability to dream and chase it. Even if the children are getting educated, they work part time at these places.

Thus causing distractions and reducing the prospects of them learning about a life besides slopping.

Child labour is the foundation for the present day lack of required skill sets in young adults, thereby reducing their ability to compete in the market.

It has come to limelight that some of these children are being forced into hazardous activity by their parents for their thirst for better lifestyle and luxuries.

Some of these parents are very much uneducated, ignorant and products of child labour themselves. Due to their ignorance these kids are being pushed into the same cycle.

For parents, when it comes to choosing between job and education among their kids, its always the girl child loses her right to education in these conditions.

In fact sources have reported that the match making industry employs majority women and underaged girls.

The blight of Sivakasi was docu-memorialized by the late Chalam Bannurkar almost 25 years ago. The film, Kutty Japanin Kuzhandaigal (Children of Mini-Japan), chronicled the stark tragedy of Sivakasi's children without childhood. Seventy per cent of the children, sweating it out in 10-12 hour shifts under hellish working conditions for beggarly wages, are girls in pigtails. Bannurkar focussed on the overworked, underpaid children through a detailed enquiry into situations that had driven them to the factory gates.

The truth is that every fourth Indian child must go to work for his own survival and that of his family. While official sources maintain that the total number of child workers would be in the region of 20 million, independent sources claim that 50 million, if not more, would be a more accurate figure.

The problem lies in the failure of the authorities to implement the tall promises and pious resolutions that the masses have been hearing for ages.



INSTITUTIONAL BUILDINGS

PLATE 4.2. 3 INSTITUTIONAL BUILDING MAP
4.2.4 PUBLIC BUILDINGS MAPPING

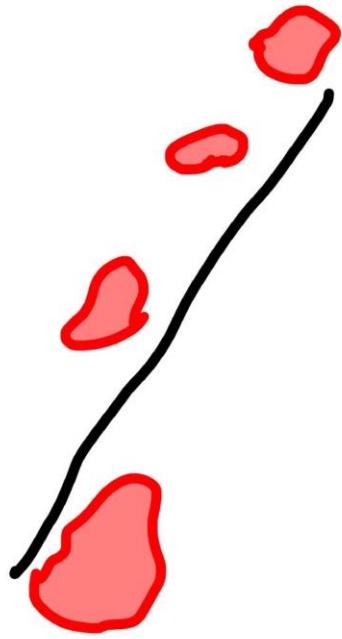
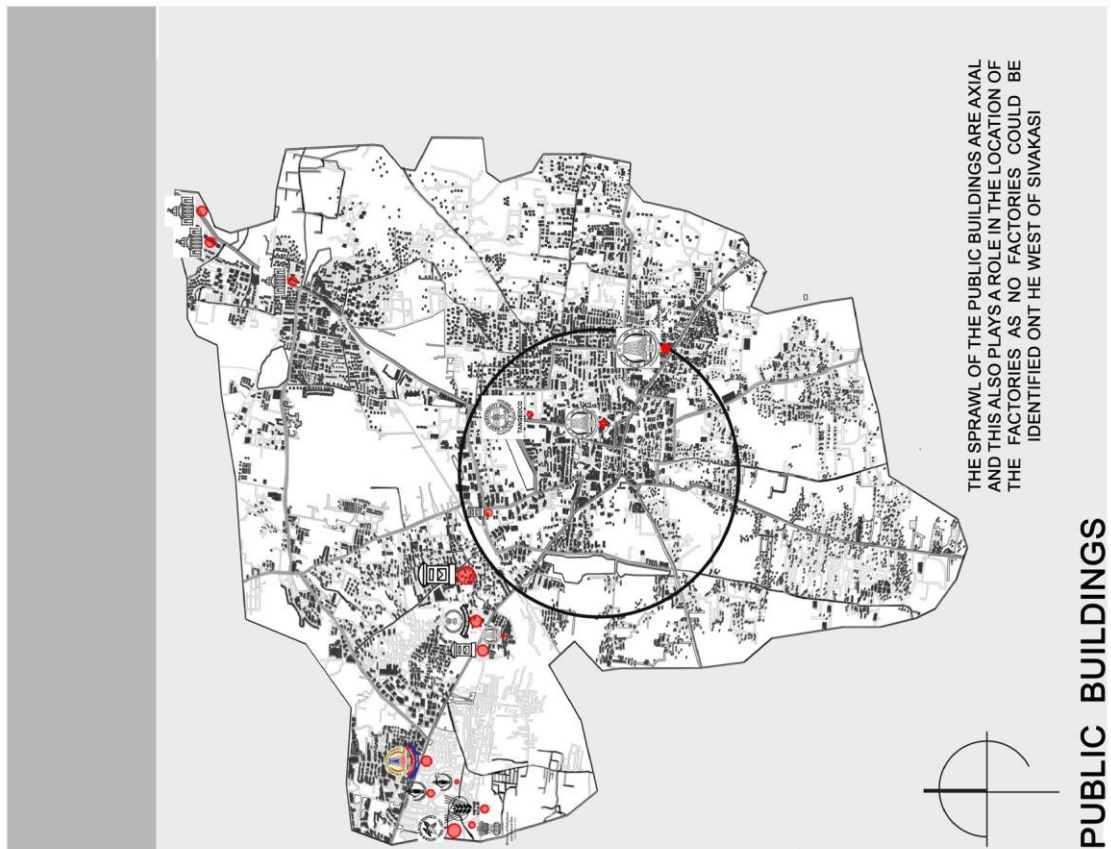
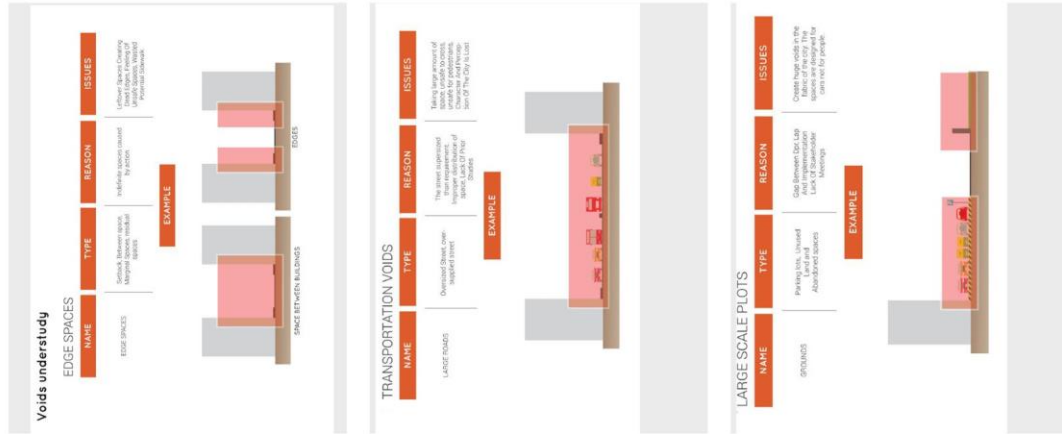


PLATE 4.2. 4 PUBLIC BUILDING MAP

4.2.5 TYPES OF VOIDS



Open and green spaces have become increasingly contested grounds in the context of urban densification. Public spaces have become scarce or of least usage in such labor reinforced type of community. There is always problems when cities or towns are built in isolation during the process creating under used spaces all around the cities which are in fact reflects on negligence and bad perceptions of the place.

TYPES OF VOIDS

PLATE 4.2. 5 ANALYSIS ON TYPES OF VOID

4.2.6 VEGETATION SHEET



VEGETATION MAPPING

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PLATE 4.2. 6 VEGETATION ANALYSIS

4.2.7 IDENTIFIED TRAFFIC CONGESTION JUNCTIONS

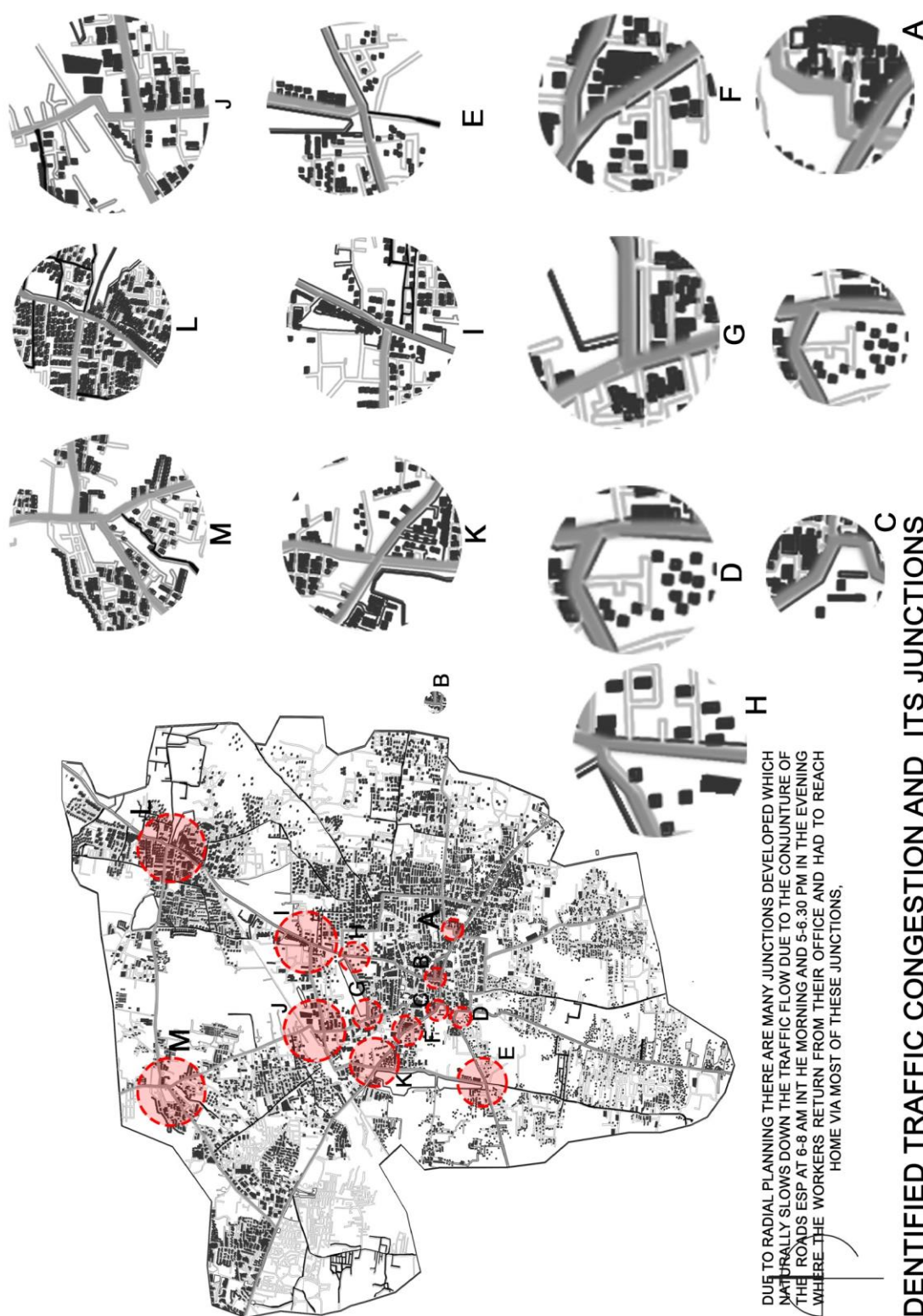
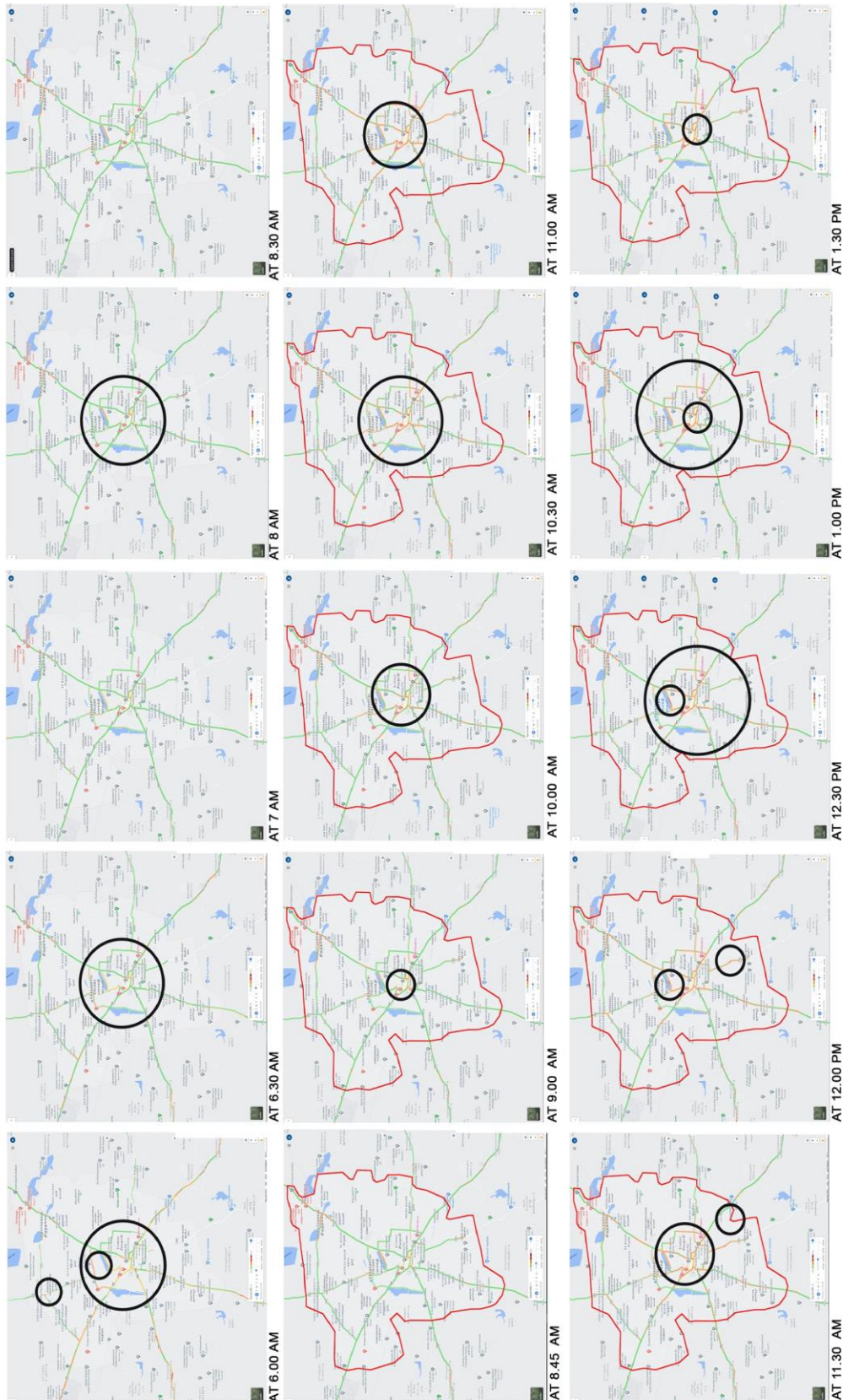


PLATE 4.2. 7 ANALYSIS ON TRAFFIC CONGESTION

JUNCTIONS

4.2.7.1 MAPPING THE JUNCTION CLOSURE



TRAFFIC ANALYSIS MAP FOR EVERY 15MINS OF A WORKING WEEK DAY

PLATE 4.2. 7.1 MAPPING THE JUNCTION CLOSURE

4.2.7.2 MAPPING THE JUNCTION CLOSURE

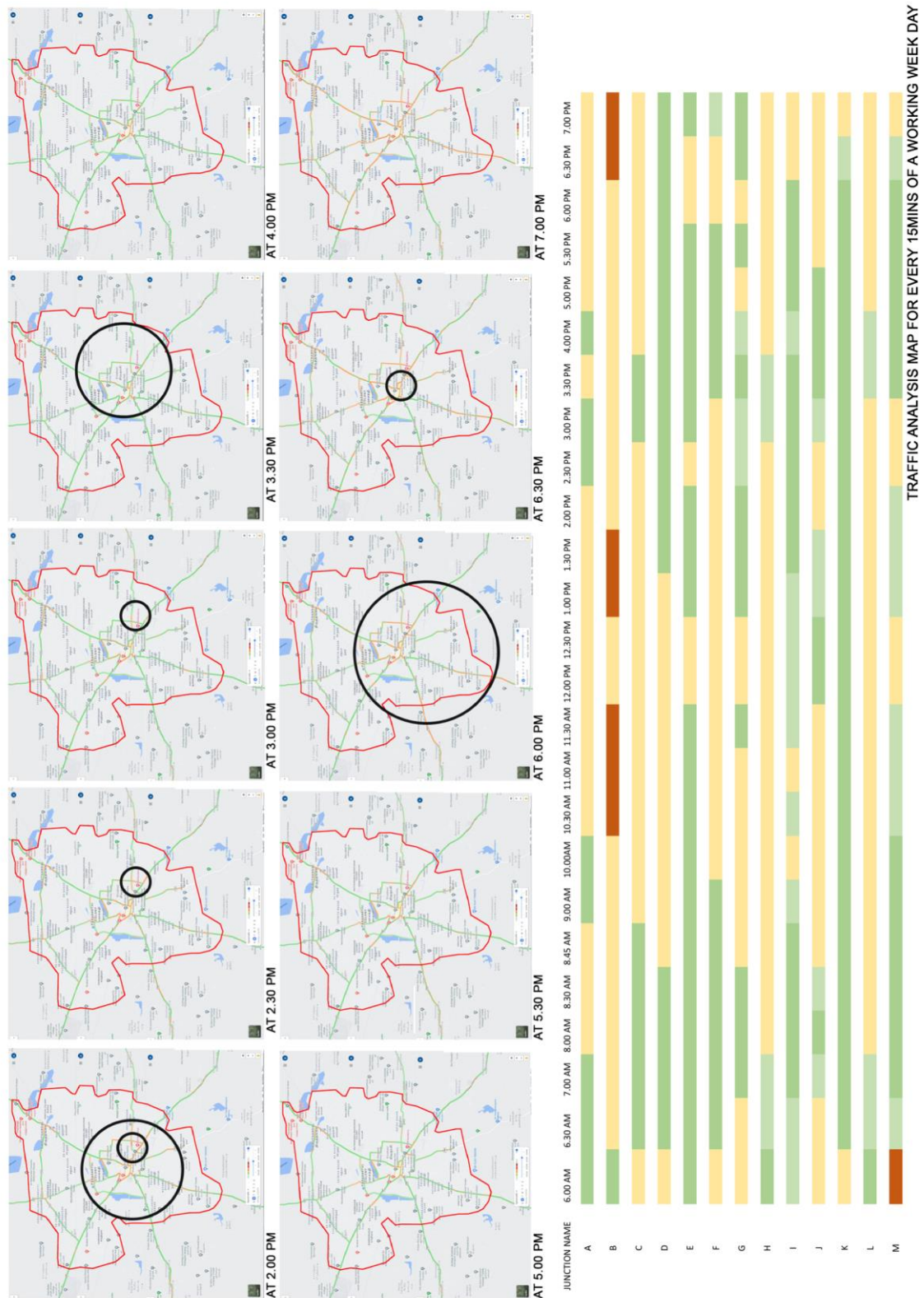


PLATE 4.2. 7.2 MAPPING THE JUNCTION CLOSURE
4.2.7.3 TRAFFIC ANALYSIS OF THE MAJOR CONGESTION JUNCTIONS
OBSERVED IN THE TOWN

At junction A (3 Road Junction (SATTUR ROAD-NARANAPURAM ROAD-GANDHI ROAD))-

The flow of the traffic is very comfortable in the morning busy hours (6-9) where as a slight light congestion begins on towards the GANDHI ROAD around 7 AM and the congestion spreads evenly on the other two roads (Towards SATUR Rd. and NARANAPURAM Rd.)

The LIGHT CONGESTION exists from 10.30 AM to 1.30 PM on a working day. The congestion first frees along the NARANAPURAM Rd. by 2.00 PM later along SATTUR ROAD by 2.30 PM, yet the light congestion prevails on the GANDHI ROAD throughout the working hours of the town.

At junction B (2 Part Junction (THIRUTHANGAL-SATTUR ROAD))

This Junction shows Light congestion at the early busy hours of the town at 6AM on the Thiruthangal road later attracts the congestion on other 2 roads as well by 9 AM. Later at around 10.30 AM there is s heavy congestion experienced on the main THIRUTHANGAL AND SATUR ROAD Junction which prevails until 12.00 PM yet there this light congestion which exists.

At around the lunch time 1.00PM There is heavy traffic on the junction of Thiruthangal-Sattur road and as well on the SIVAKASI-SATTUR road towards SATTUR. The heavy congestion at the junction gradually reaches slight congestion around 2.00PM and slowly the bypass road for SATTUR reaches normal traffic flow around 3.00PM.

Throughout until this time there is a slight congestion which exists at the junctions, which later hits heavy congestion at 6.30 PM and prevails until the people reach back home from their work places at around 7.30 to 8.00 PM.

At Junction C (3 Meandering Road Transit Junction (NARIKUDI PARTHIBANOOR ROAD,MUSLIM THAIKKA St, POLICE STATION ROAD))

This junction holds a mild congestion at the early minutes of the morning peak hours around (6.00 AM) And weakens by 7.00 AM

AT 8.00 AM, there is mild congestion on the junction which intensifies by 9.00 AM

At 10.00AM the congestion moves from the junction towards the NARIKUDI PARTHIBANOOR ROAD and by 10.30 AM the mild congestions takes up overall of the roads and junction.

This strong mild congestion begins to weaken around 3.00 PM and by 3.30 PM free flow begins except for the junction/patch which prevails from the morning. Later by 5.00PM the NARIKUDI PARTHIBANOOR ROAD up from the junction takes up the congestion which later spreads to the rest of the junction network by 7.00 PM

At junction D (3 Meandering road junction (SIVAKASI ALANKULAM ROAD, 183, SATTUR SIVAKASI KALUGUMALAI ROAD (187)

From 6.00 AM to 8.30 AM the network of roads experiences free flow of traffic By 9.00AM the SIVAKASI ALANKULAM ROAD junction shows the initiation of mild congestion.

By 10.00 AM the SATTUR-SIVIKASI- KALUGUMALAI ROAD picks up the mild traffic congestion which prevails until 12.30 PM.

By 1.00 PM the mild congestion begins to weaken along the roads 183 and SATTUR SIVAKASI KALUGUMALAI ROAD yet a persistent congestion on the alankulam-sivakasi Sattur junction throughout until 7.00 PM

At junction E (2 ROAD MAJOR JUNCTION AND 3 ROAD TRANSIT JUNCTIONS (PERIAKULAM ROAD- 183 STATE HIGHWAY))

This is a perpendicular transit junction along the Periakulam.

Three roads here show free traffic flow from 6.00 AM to 9.00 AM, whereas the road the 183 towards the centre of Sivakasi begins to experience light congestion by 10.00 AM which intensifies towards the centre and until the junction till 11.00 AM

By around 11.30 AM the congestion on the road weakens and all roads take up free flow from 12.00 PM

At junction F (meandering 2 Road junction (SRIVILLIPUTHUR-THIRUTHANGAL ROAD- NARIKUDI PARTHIBANOOR ROAD))

This junction shows light congestion at 6.00 AM which by 6.30 AM gets cleared and holds free flow until 9.00 AM.

By around 10.00 AM spreadedly the light congestion takes over and by 10.30 AM the entire junction and the roads experience mild congestion which exists until 2.30 PM.

By 3.00 PM there is a gradual weakening of the congestion and the roads and junctions become free flowing until 5.00PM

By 5.30 PM the mild congestion again picks up and at 6.00 PM the roads and the junction hold throughout mild congestion until 8.00 PM (Heavy work-transit hours).

At junction G (2 perpendicular road junction (RAILWAY FEEDER ROAD, NARIKUDI PARTHIBANOOR ROAD))

From 6.00 AM there is a serious fluctuations observed at this junction and the road network.

By 7.00 the NARIKUDI PARTHIBANOOR ROAD experienced throughout mild congestion which by 8.00AM reaches moderate congestion on the far end of the same road.

While the congestion prevails on this road, by 10.30 AM the railway feeder road and the junction start facing the mild congestion that slowly revolves around the network of roads and junctions.

By 11.30AM one part of the junction eases for free flow while by 12.00 PM, the entire junction and the road networks face mild congestion and there is heavy congestion on the middle of NARIKUDI PARTHIBANOOR ROAD

By 1.00 PM the heavy congestion weakens and the junction handles a free traffic flow

By 4.00 PM the railway feeder road initiates a mild congestion which by 5.00 PM

weakens and shifts to NARIKUDI PARTHIBANOOR ROAD

By 5.30 PM the junction eases out for free flow.

By 7.00 PM the junction again experiences congestion.

At junction H

(3 Meandering road Junction (GNANAGIRI ROAD- NARIKUDI PARTHIBANOOR ROAD-THIRUTHANGAL ROAD)

At 6.00 AM itself the NARIKUDI PARTHIBANOOR ROAD is under mild congestion until 10.30 AM where the congestion also sprawls towards the other 2 roads.

By 11.00 AM the junction experiences throughout mild congestion and prevails until 1.00PM

BY 1.00PM only the NARIKUDI PARTHIBANOOR ROAD is under throughout congestion extending till the farther end of the road.

By 2.30 PM the congestion sprawls towards the thiruthangal road and clears out at thiruthangal road by 4.00PM

The NARIKUDI PARTHIBANOOR ROAD is under mild congestion throughout the day.

At junction I (2Road Meandering Junction (NARIKUDI PARTHIBANOOR ROAD-VE-LAYUTHAM ROAD)

Here the VELAYUTHAM Rd shows mild congestion at 6.00 AM where as there is free flow throughout the NARIKUDI PARTHIBANOOR ROAD.

By 8.00AM the congestions subside and the junction holds a free flow of traffic.

Later by 9.00 AM the NARIKUDI PARTHIBANOOR ROAD picks up mild congestion and by 12.00 PM mild congestion prevails throughout the roads and the junction.

By 1.00 PM the congestion on NARIKUDI PARTHIBANOOR ROAD weakens and by 3.00PM, the congestion on the VELAYUTHAM ROAD also weakens.

By 6.00PM again the mild congestion picks up along VELAYUTHAM ROAD which prevails for the later part of the evening.

At junction J (4 Cross Road junction (CHAIRMAN A.R ARUNACHALAM ROAD, VELAYUTHAM ROAD, RAILWAY FEEDER ROAD)

The junction on the morning busy hours 6.00 AM to 8.30 AM shows a fluctuating mild and free traffic congestion.

By 8.45 AM There is a strong mild congestion on the RAILWAY FEEDER ROAD AND VELAYUTHAM ROAD which lasts till 11.30 AM.

By 12.00 PM Velayutham road weakens the congestion and by 2.00PM again the junction picks up mild congestion throughout which weakens by 3.30 PM. The railway feed road holds throughout mild congestion at 7.00 PM

At junction K (2 cross road junction (Periakulam road-thiruthangal srivilliputhur road))

The road linearly opposite to Periyakulam road is in mild congestion from 6.00 AM By 6.30 AM it gets cleared and by 7.00 AM all the roads and junction hold free flow of traffic.

By 10.30 AM there is a slight mild congestion on the Periyakulam road.

By 11.00 AM there is a slight mild congestion on the srivilliputhur road which gets cleared by around 1.30 PM.

Later for the rest of the day the road network and the junction holds a free flow except for at 7.00 PM

At junction L (2 Perpendicular road junction (SN PURAM ROAD-THIRUTHANGAL ROAD))

From 6.00AM the road and the junction appears to be free flowing

By 8.00 AM on both the roads as well the junction a mild congestion is observed.

This congestion prevails until 3.00 PM where the SN PURAM road eases out until 5.00 PM

From 5.00PM the mild congestion gradually strengthens and sprawls the road network and junction until and after 7.00 PM

4.3 URBAN INTERVENTION ZONING

Amidst the central study carried out, for the sprawl until the major congestion junctions, it was evident that the town lack a sense of imageability and communal life. People seemed to be absorbed with their routine lifestyle and the entire Town looks deserted.

There was a focus group and questionnaire circulated during the visit and its analysis also showcases the fact that people lack the basic essentials and lead a very meagre aspirational living. The following sheets took a chance to locate such spots which can aid in bringing up a communal change in how these spaces are perceived and a schematic conceptual planning idea is put forth as it would be a constrain to not able to take social spaces itself as an entire thesis and work over.

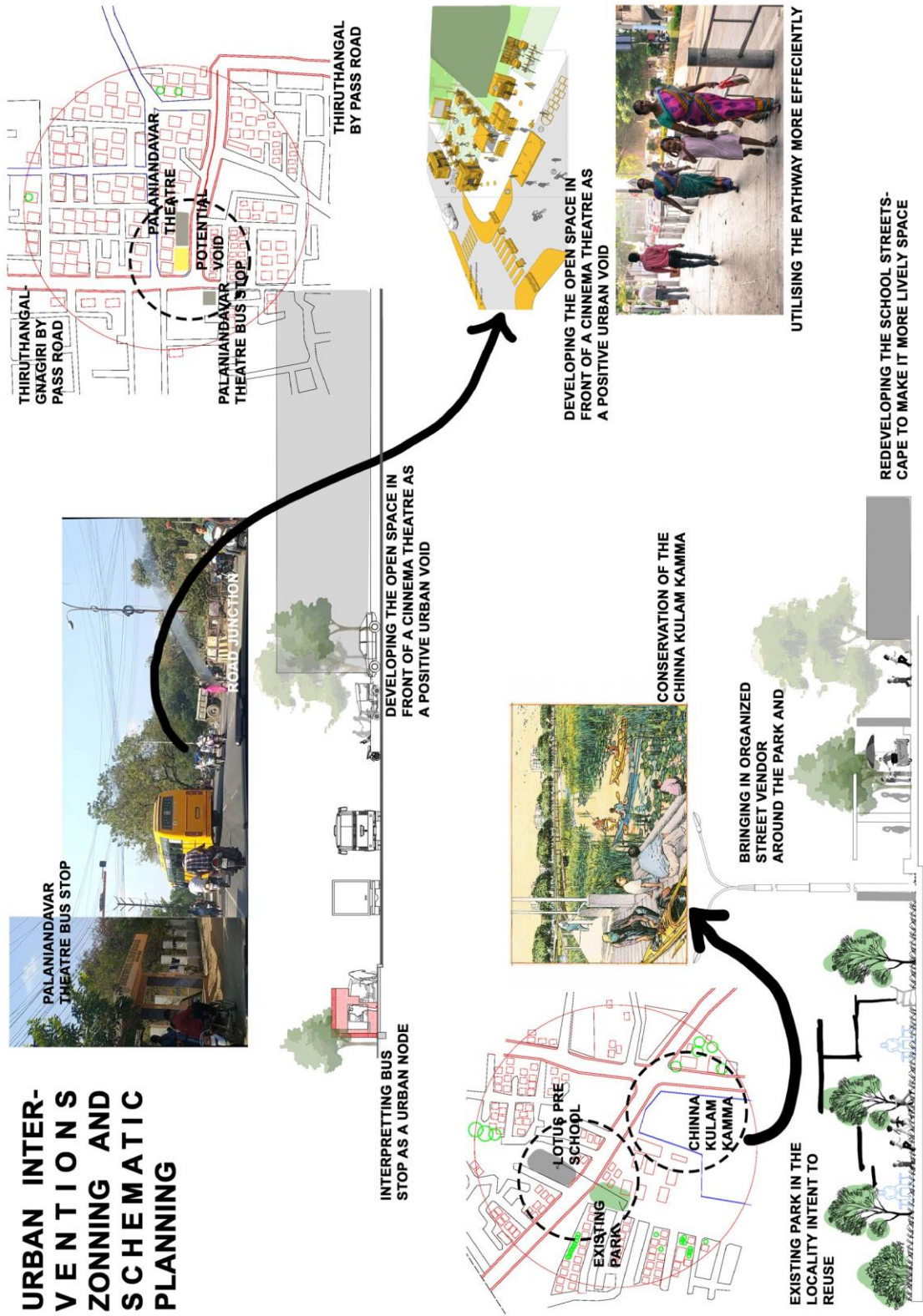
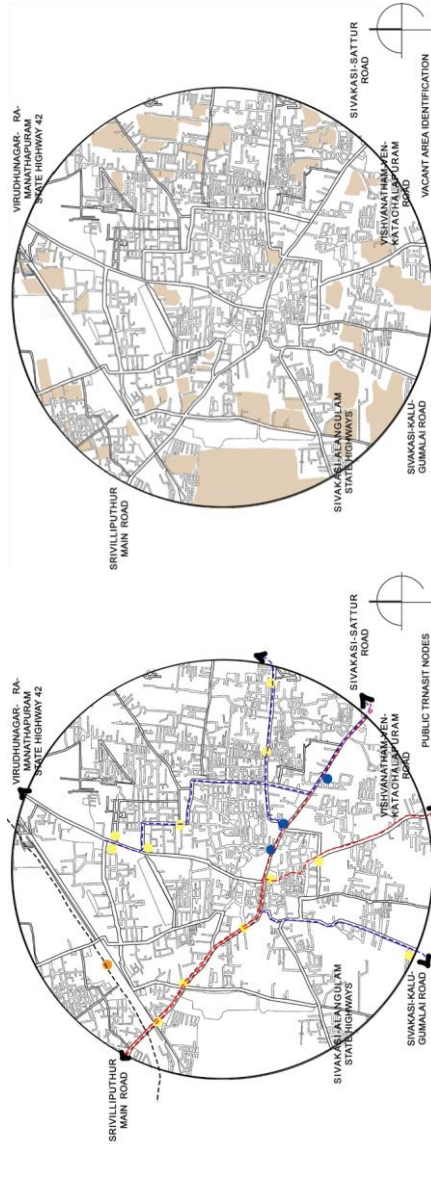
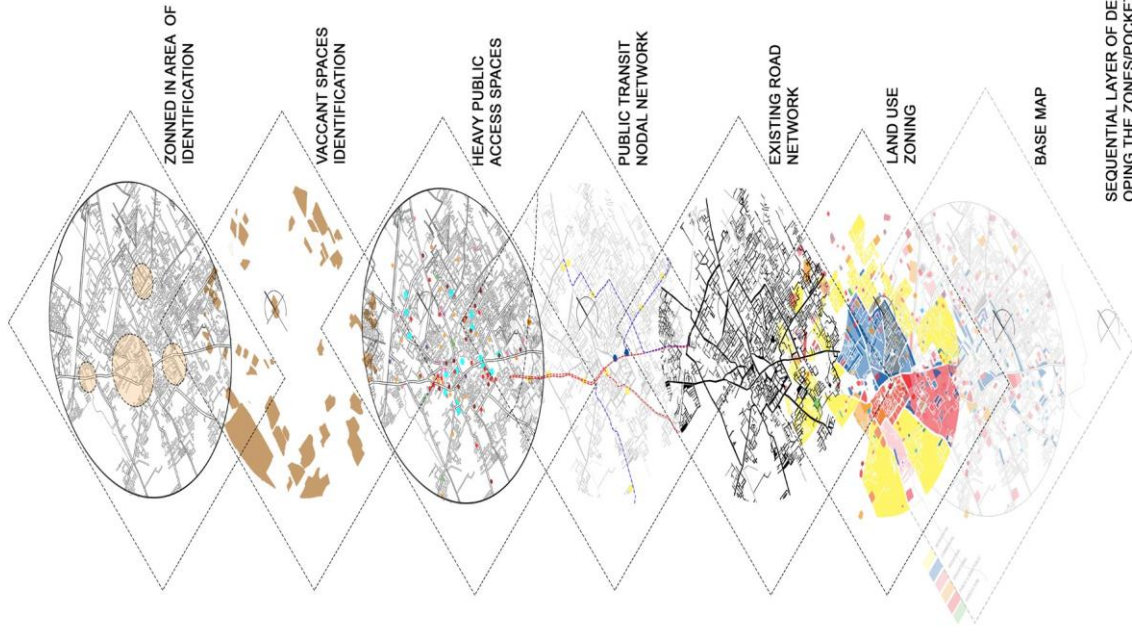
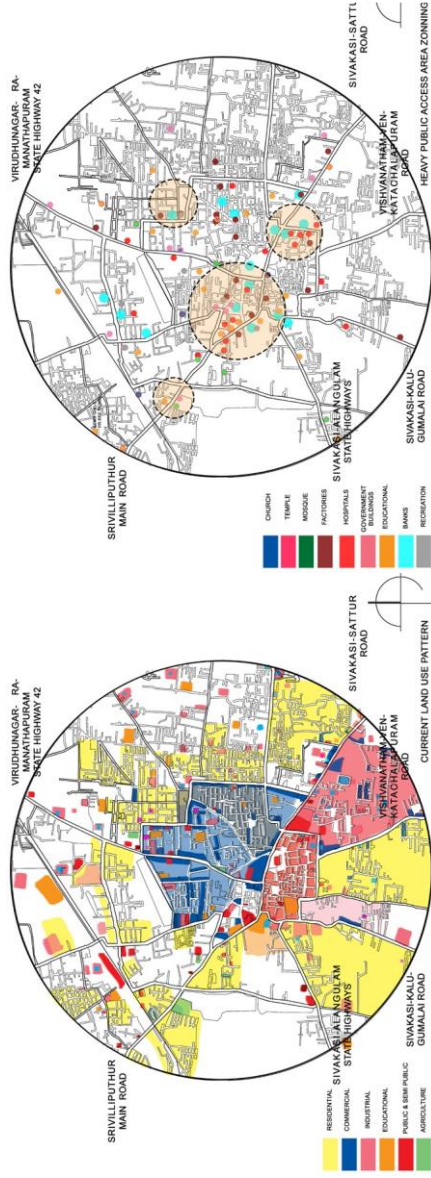


PLATE 4.3. 1 NET STUDY -URBAN INTERVENTION ZONING AND SCHEMATIC PLANNING

4.4CONTEXT ANALYSIS

From the above studies, a coherent study is developed to dive even more deeper in order to bridge, the macro and micro analysis to obtain holistic ideology and thus take forward the architectural work.

The following sheets illustrate and aid to understand multy level/dimensional issues and also indirectly navigate the location/site over which the intervention can make an impact.



SEQUENTIAL LAYER OF DEVELOPING THE ZONES/POCKETS

PLATE 4.4. 1 NET STUDY -CONTEXTUAL ANALYSIS OF SITE

4.5. EXPORATION OF PROBLEMS

RISKS IDENTIFIED  Least distraction and slippage can cause huge disaster.  Smoking and alcoholism during work leads to dire accidents.  Inadequate fire technology to prevent the fire at the fire stage of growing.  No government identity cards are seen yet all the schemes reach the labors.  The economic demand at Sivakasi is quite low on rent for a labor.	 Many schools are run by the fire company themselves within the town, yet the number of dropouts from school are increasing.  Kids, specifically girl children are being lured into this industry due to the attractive sum they receive rather than the education they deserve.  At times of emergency, it takes 20 to 30 minutes for emergency services access. No proper fire safety drills on site.	ATTITUDE  1. Stubborn attitude towards acceptability of a better standard living beyond the cracker works and allied jobs. 2. Ignorance towards exposing themselves beyond the boundaries of the industry. 3. Welcoming attitude towards the current quality of living. 4. Lack of inspiration or the ability to be inspired to increase their standards. 5. Incompetency in embracing digitalization for self development and growth. 6. Majority of the youth and children population prefer to slog in factories rather than educate themselves.	7. The compensation offered for the death of the employees is an eye catcher for these poor, uneducated people. 8. The town's infrastructure has shortcomings of its own in that it cannot handle a floating population and a zealous outlook. 9. Open sewage system inside and out pose untidy and unhealthy society to dwell in. 10. Public toilet condition is questionable. 11. Casteism plays a pivotal role even in granting permission to the kids to even play in grounds. 12. The natural layout, soil, water and climatic conditions of the town has crafted the incapability to practice agriculture thereby making them depend on the match making, fire works crafting, textile industry etc.
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OWNING AN ADDRESS-ESTABLISHING IDENTITY AND DIGNITY THROUGH ARCHITECTURE | THESIS 2016-2021 | KRISHNA PRIYA, P | 3621043 |

PLATE 4.5. 1 NET STUDY -IDENTIFICATION OF PRE-EXSISTING RISK FACTORS

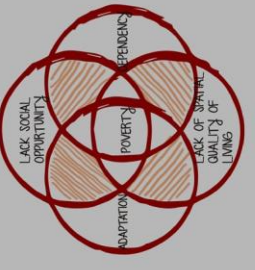
4.6. PROGRAM DEVELOPMENT

Architects sensitively alive towards humanity and social causes, work with a hope and conviction that the process of spatial-problem solving and design can earnestly bring and induce changes in the living of the people. It is approached by comprehensively developing design strategies ensuring the cost-effectiveness in promoting self-evolving dwellings in both macro and micro levels of settlement.



AREA OF INTEREST

The area of interest here, is to find certain latent attributes in dwellings that often go disregarded and understand the exponential impact it wields on the lives of people in question, culminating in a proper discernment of all the design strategies that underpin the same.



Quality of living is a basic right to sustain oneself under circumstances which determine the state of content physically, psychologically, socially, environmentally and in many more layers. It also dictates the ability of the people to flourish themselves by rendering them with the right opportunity, which adds to the charm of being their host until then.



1. Since the design involves to foresee a transitional shift in the quality of living, the spatial and as well the town planning play a humongous role in iterating the capacity and potential on the quality of living rendered.



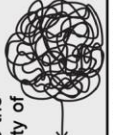
2. The complexity of fire in general and its live or die attitude imposed on the workers is challenging and at the same time very much a part of the design as it ties many levels of compromises and develops an attitude within them to face things without a baggage.



UNDERSTANDING THE NUANCES OF INTANGIBLE COMPLEXITY WITHIN THE END USERS.

Across all sections of the people, there is an urge to "live better". Living better is not just a word of hope and ignition amongst the major classification of the people's population yet a tangential dilemma of whether it is a right or a legacy to live for it to happen.

Here, the thought is a little different wherein the catalyst for getting aspired is out of their reach and every tom dick and herry seem to live a similar a slightly better life than theirs yet, there is no strong aspiration observed within the people and this ultimately takes the question as a benefit of doubt on what is their dreamed quality of living and are they overlooking their potential in small terms.



PROGRAM IDEOLOGY

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Open and green spaces have become increasingly contested grounds in the context of urban densification. Public spaces have become scarce or of least usage in such labor reinforced type of community. There is always problems when cities or towns are built in isolation during the process creating under used spaces all around the cities which are in fact reflects on negligence and bad perceptions of the place.

3. ON THE URBAN VOIDS



Since there is no use attached to these spaces people tend to ignore these places and perceive these places as dead. These voids are the result of insufficient decision making, poor land management, poor coordination among decision makers and designers.

Urban Voids have huge potential of improving the place and creating a stronger urban fabric of the city.

Void typology

On relating this concept to the roots of the urban growth and capability in planning, the scale can range from a plot, building envelope and neighborhood. Following are the 2 main types of voids identified.

1. EDGE AND BUFFER VOIDS
2. LARGE SCALE PLOTS

A cities abundant small spaces have key impacts on the QUALITY OF LIFE. If those spaces are unattractive and left unattended, people will respond and retreat the city streets and eventually have an adverse effect on the fabric of the neighborhood.

-The Social Life of Small Urban Spaces.

Empowerment



DIGNITY PROJECT



PLATE 4.6. 1 NET STUDY -PROGRAM DEVELOPMENT

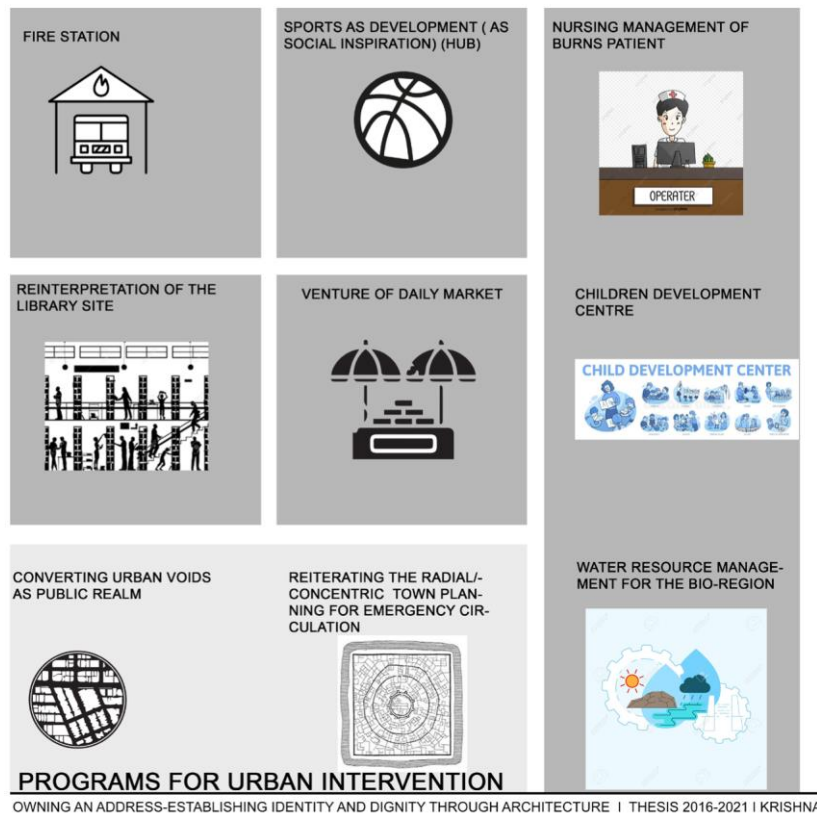
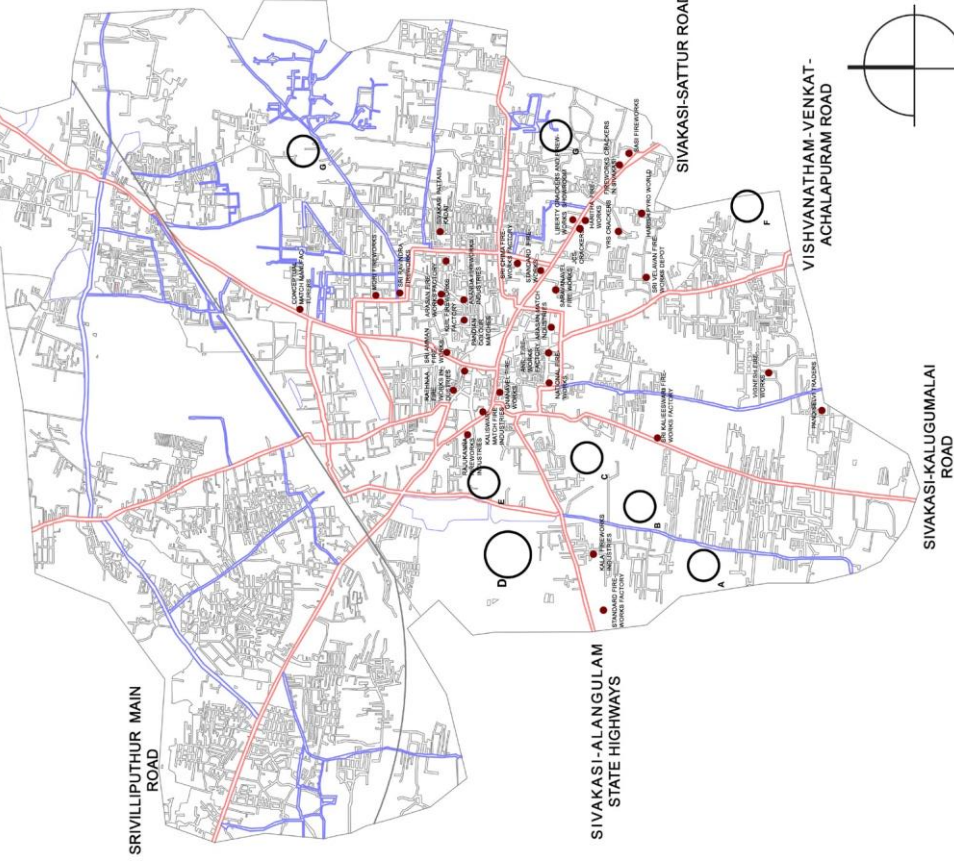


PLATE 4.6. 2 NET STUDY -PROGRAM FOR URBAN INTERVENTION

5 SITE IDENTIFICATION

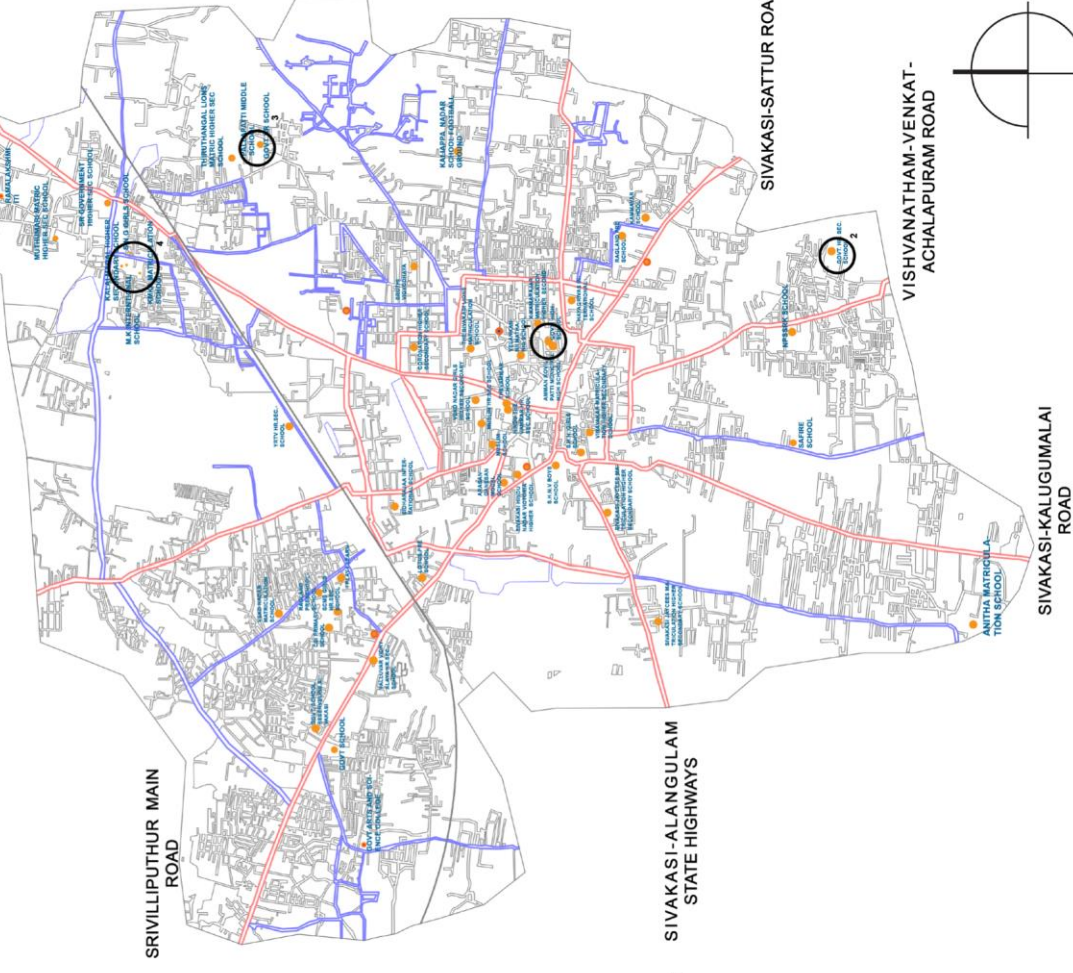
This phase is the further exploration on to justify the site location to work on for establishing the architectural program designed that in addresses, with empathy and social responsibility of taking up the shoes of the kid, the women and the men of the family who are having stranded in such a scenario (existing in real time) and with the cap of being an architect, the what sensible interventions that can foresee changes for the betterment in their lives is the objective of the thesis.

VIRUDHUNAGAR- RAMANATHAPURAM
STATE HIGHWAY 42



SITES FOR FACTORIES

VIRUDHUNAGAR- RAMANATHAPURAM
STATE HIGHWAY 42



SITES FOR SCHOOLS

PLATE 5.1. 1 NET STUDY -LOCATING THE PLAUSSIBLE 84 SITE

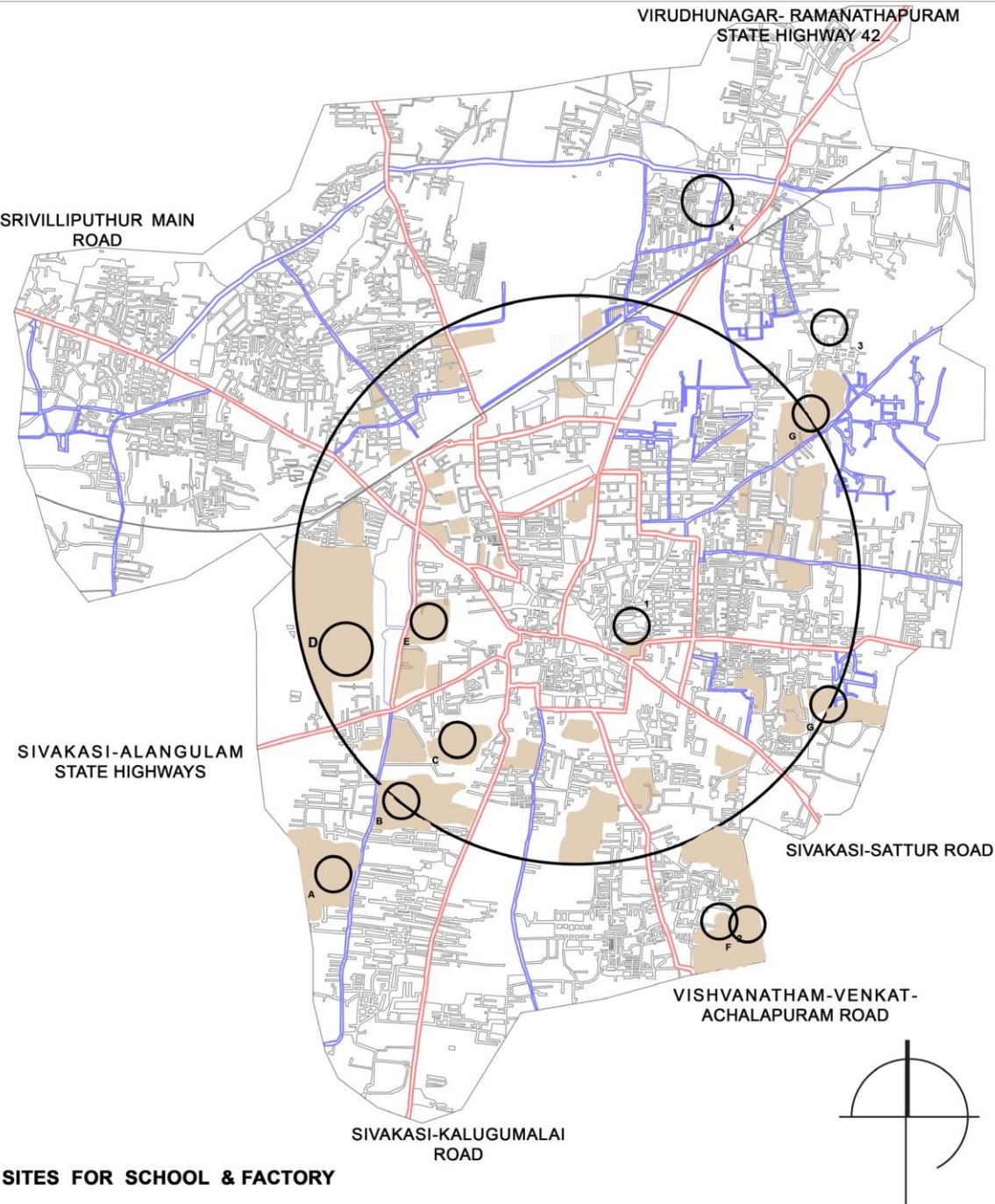
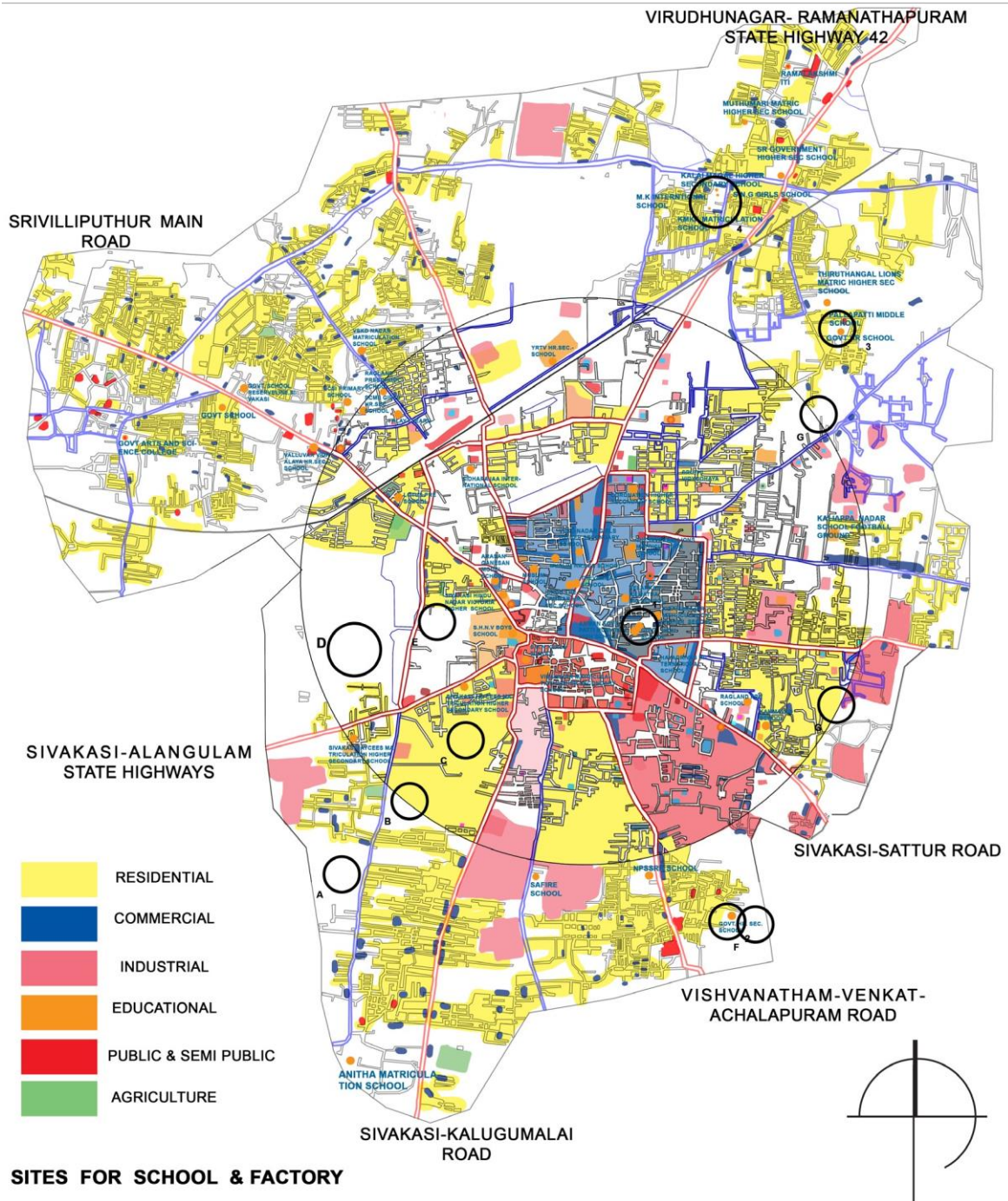


PLATE 5.1. 2 NET STUDY -SITE SELECTION



**PLATE 5.1. 3 NET STUDY -LAND USE MAP OF THE SITE
CONTEXT**

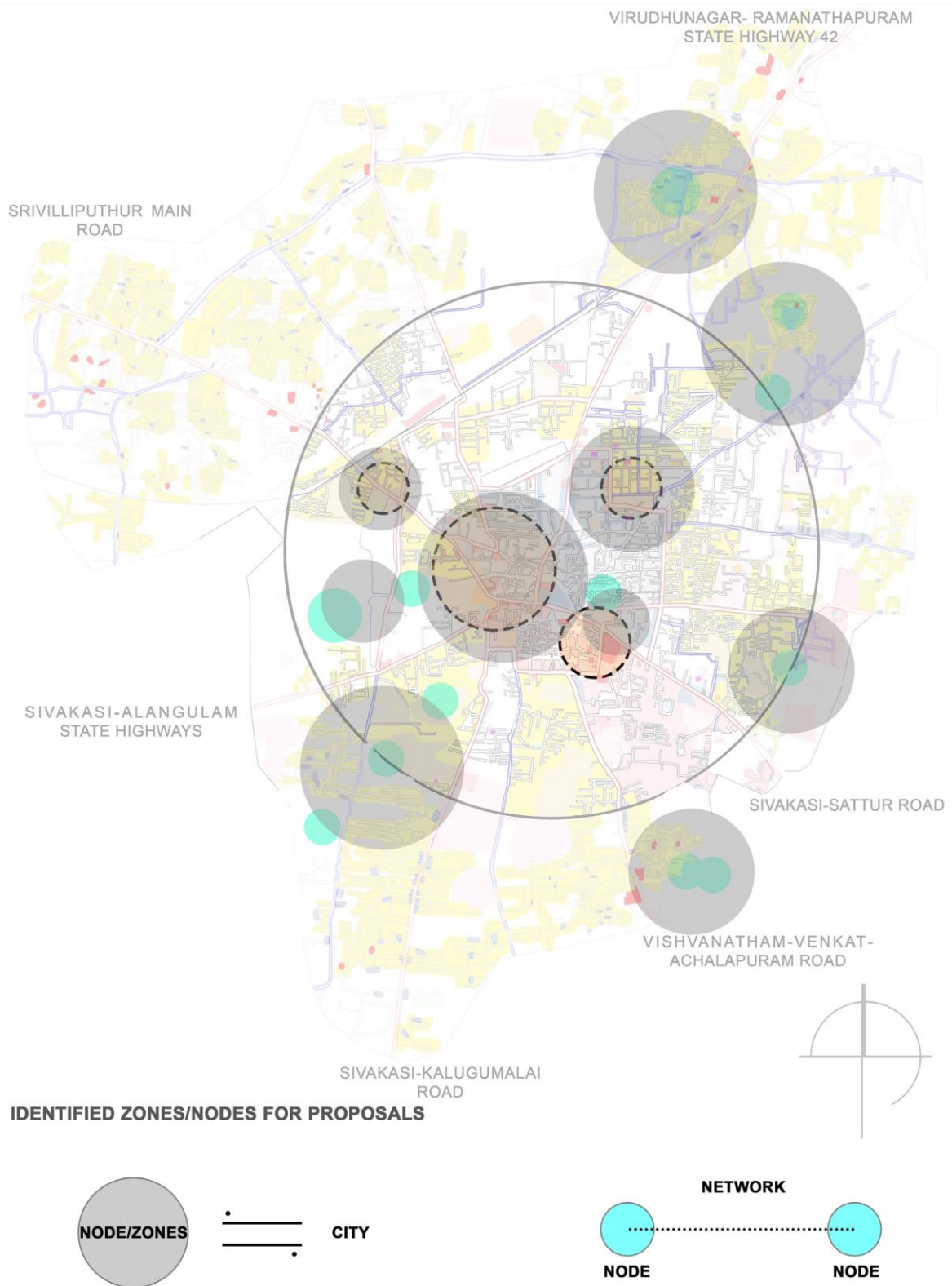
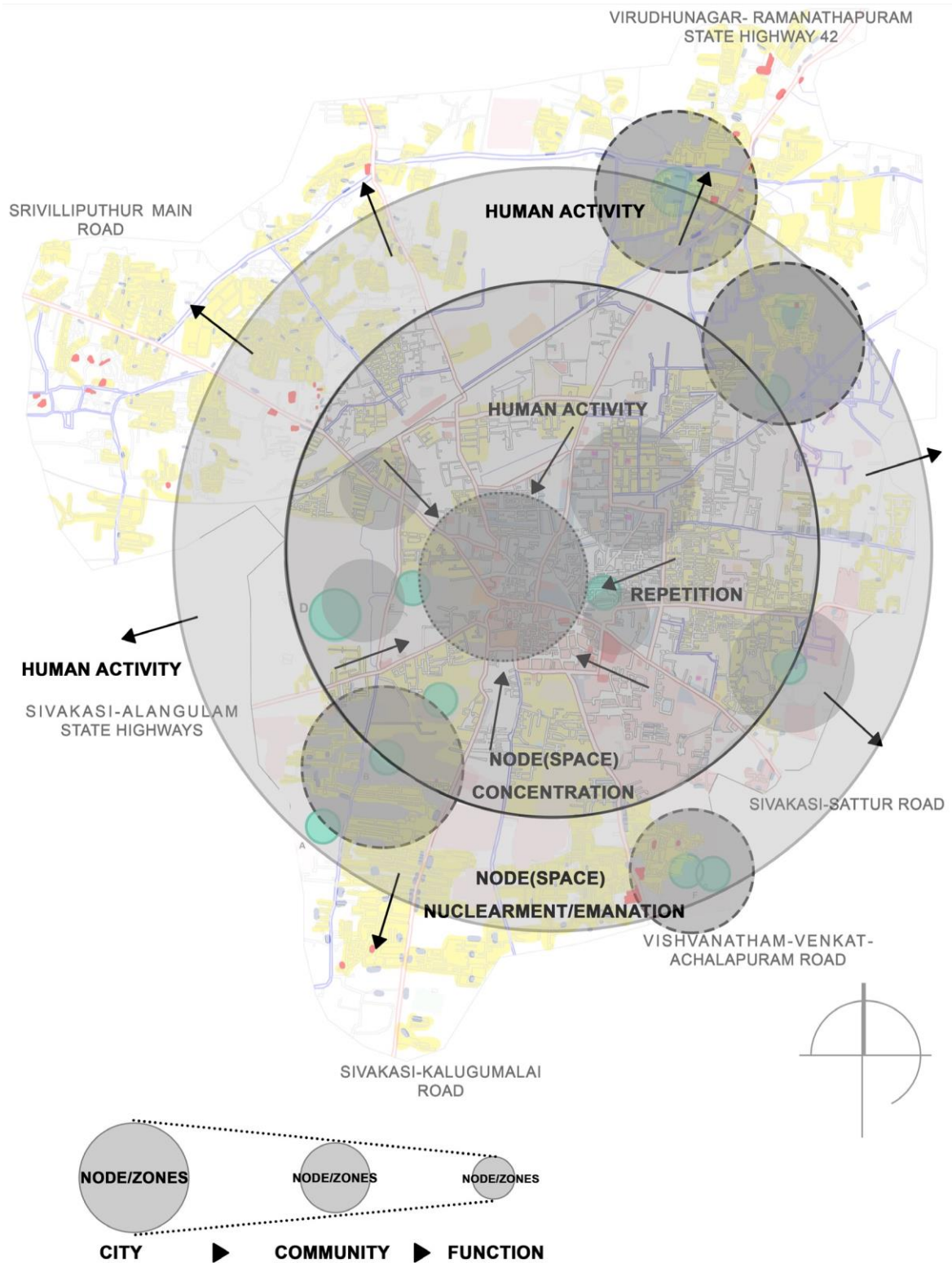
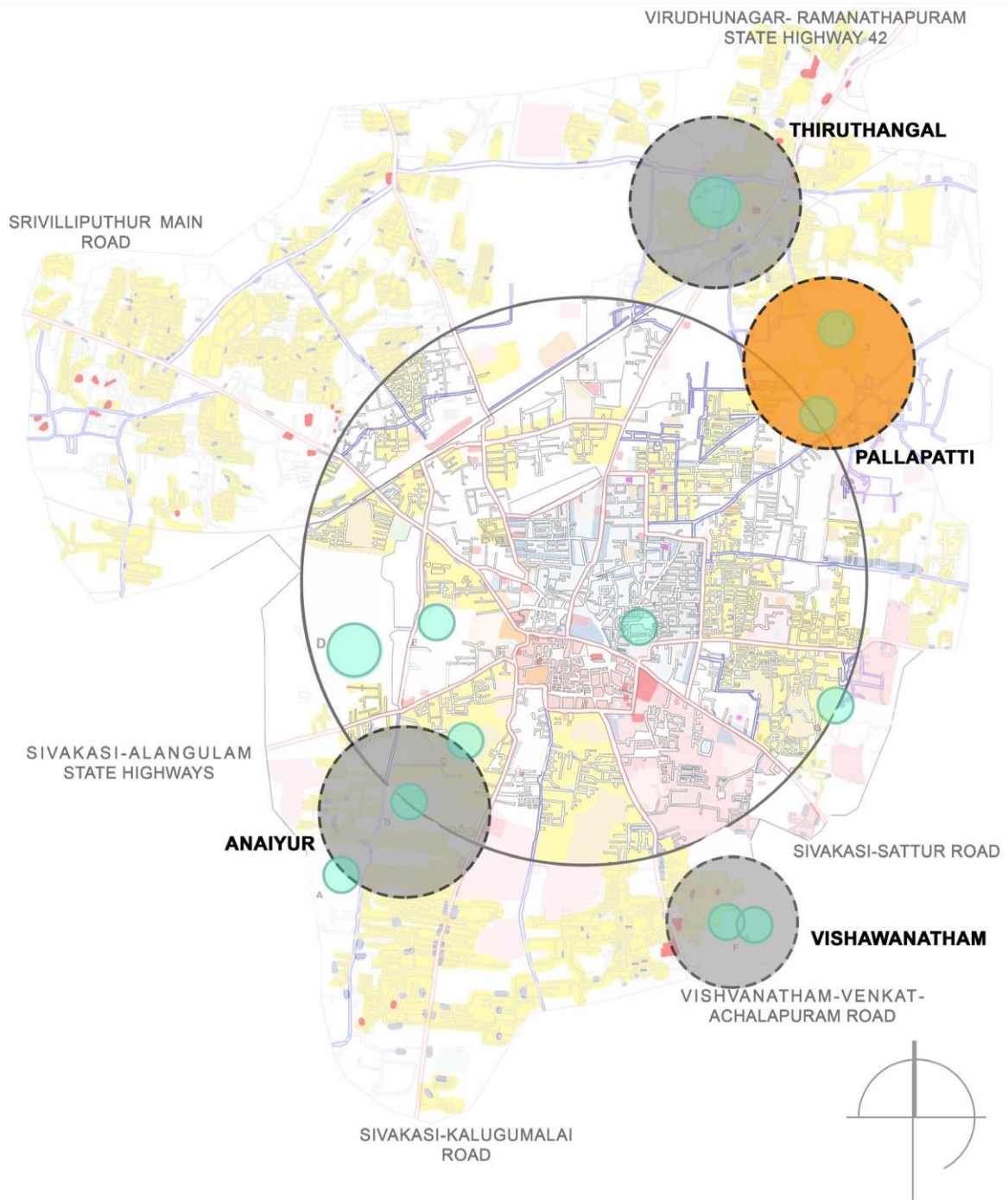


PLATE 5.1. 4 IDENTIFIED ZONES/NODES FOR PROPOSALS



ANALYSIS OF THE ZONES AND ZONING- CONCENTRATION VS NUCLEARMENT OF GROWTH IN A CITY

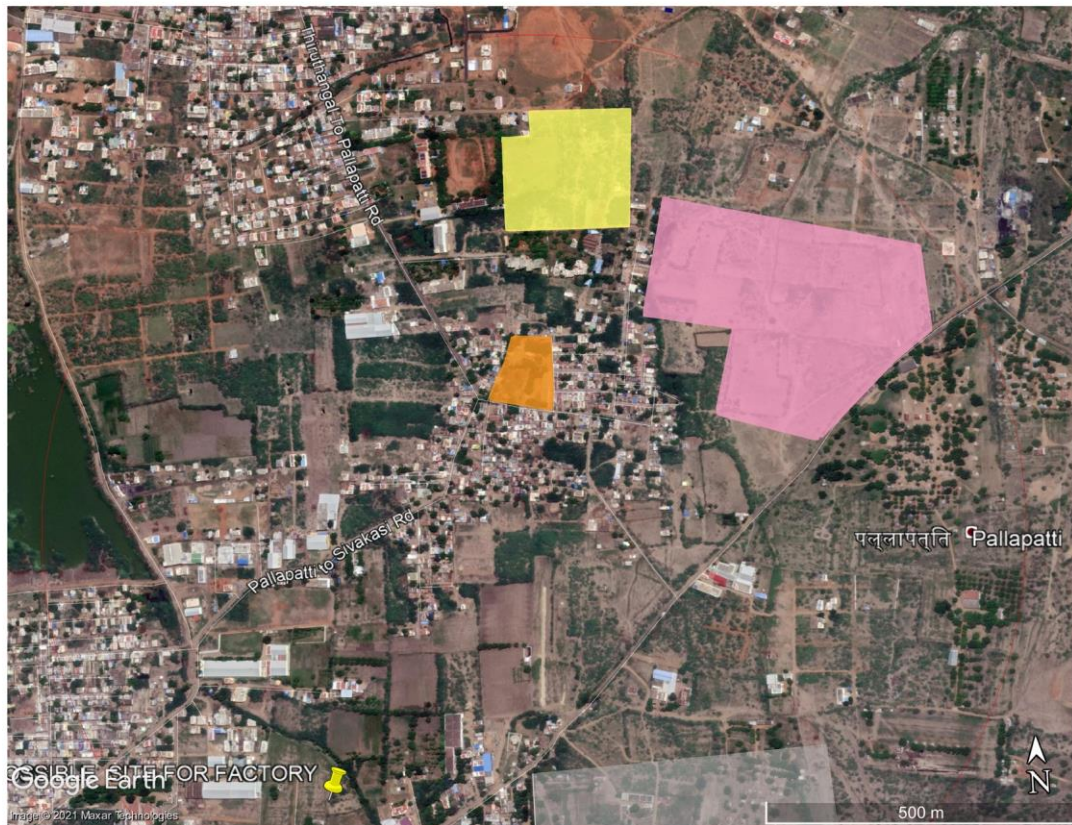
**PLATE 5.1. 5 COMPARITIVE ANALYSIS ON ZONING
CONCENTRATION AND NUCLEAR GROWTH IN THE CITY**



BASED ON THE MODERATE DENSITY AND SUFFICIENT VACANT SPACE ANALYSIS FROM EACH ZONE PALLAPATTI WAS CHOSEN TO BE ZONE FOR INTERVENTION OF THE PROPOSALS

ZONE IDENTIFICATION

PLATE 5.1. 6 NET STUDY -ZONE IDENTIFICATION



9000 SQ M (2.22 ACRE)

1,86000 SQ M (45 ACRE)

35,500 SQ M (8.8 ACRE)

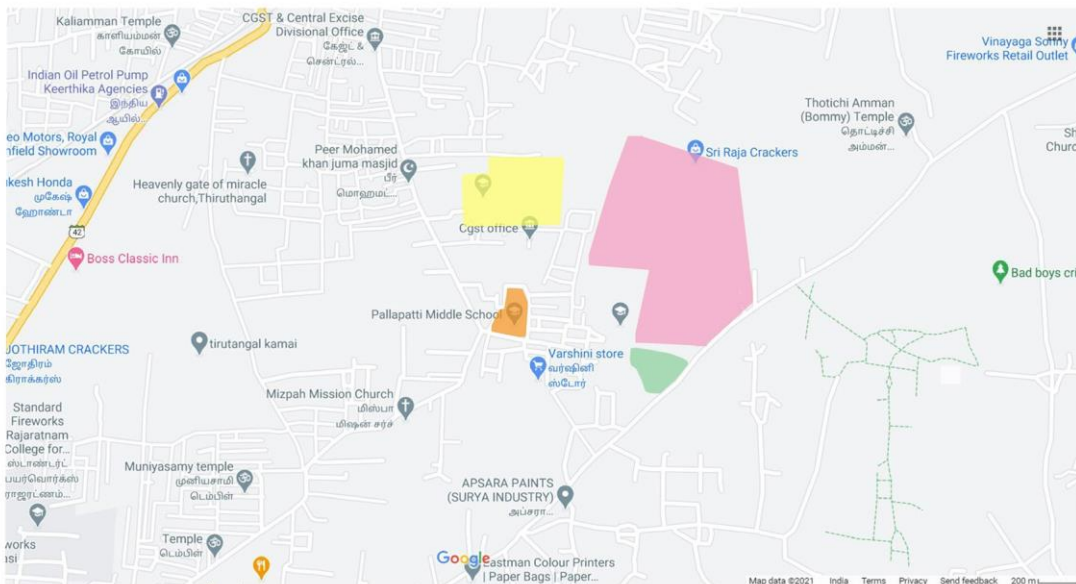
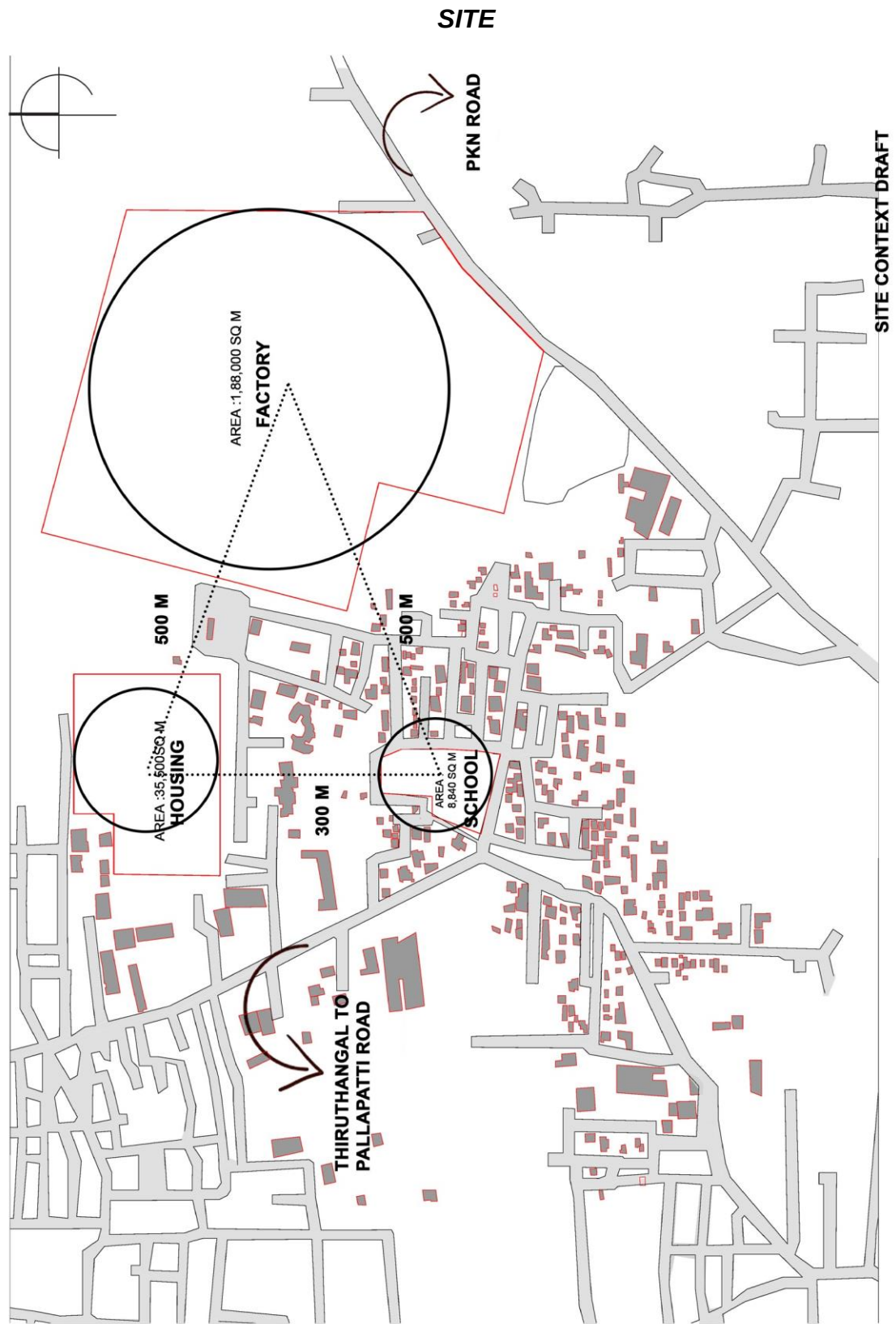


PLATE 5.1. 7 NET STUDY -LOCATING THE PLAUSSIBLE



**PLATE 5.1. 8 NET STUDY -SITE CONTEXT 6
TYPOLOGY UNDERSTANDING**

Beyond just raising the walls and attempting any fancy design, the context of the typology is very essential to find the gap in the designs and navigate the process in that very direction.

The following topic would discuss in detail the functioning of the firework factory in details along with the activity chart of the people in their daily life.

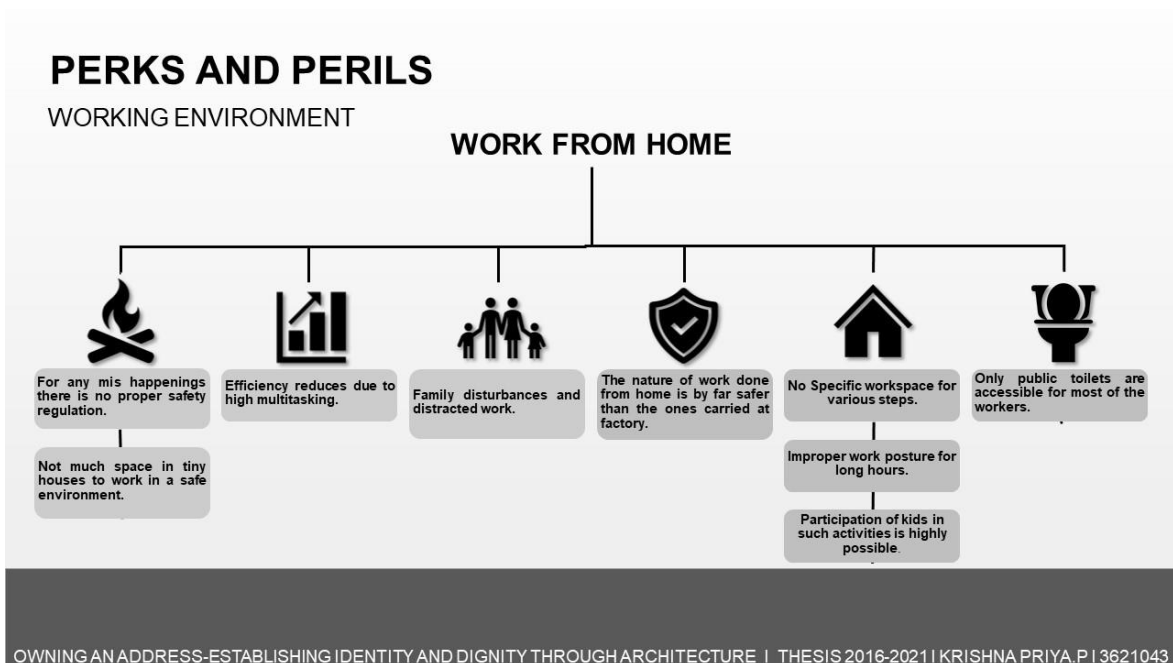
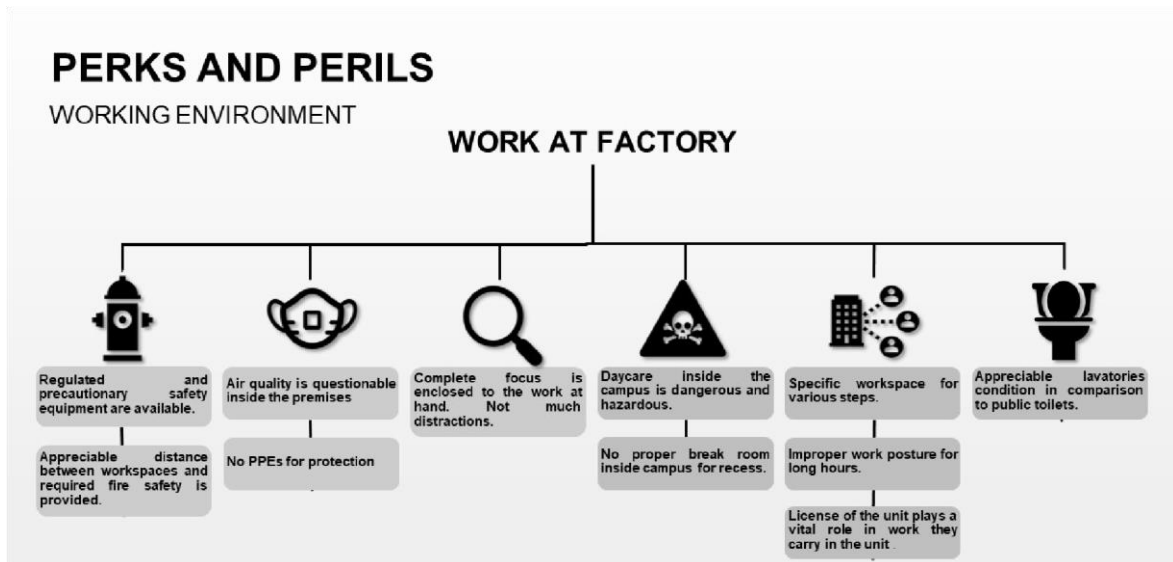
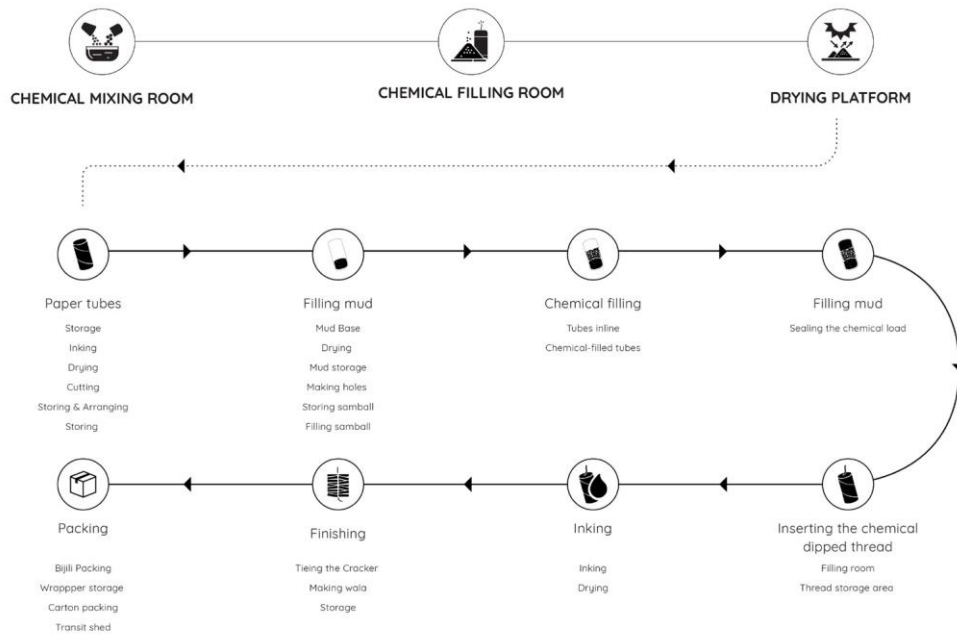
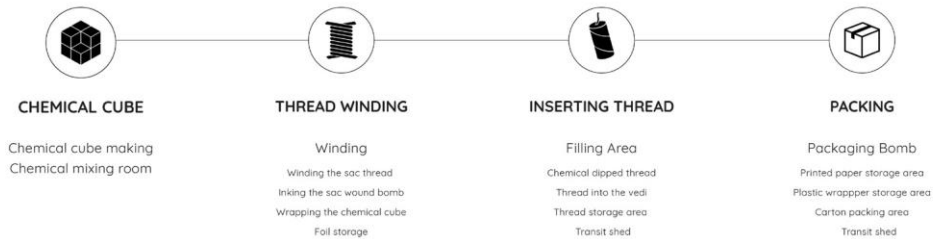


PLATE 6.1. 1 NET STUDY -ANALYSIS OF WORKING ENVIRONMENT

SARAM VEDI



BOMB



BULLET

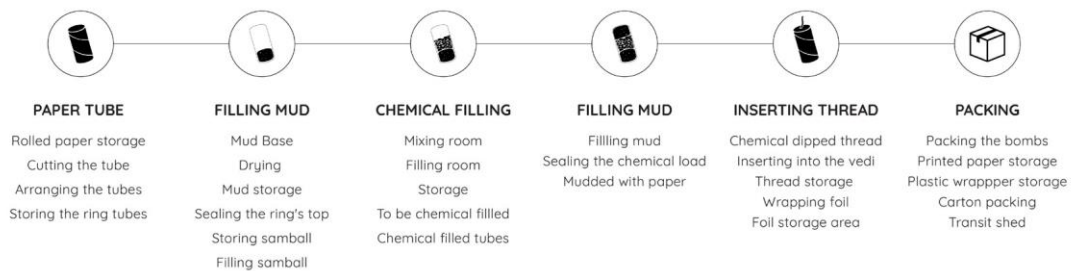
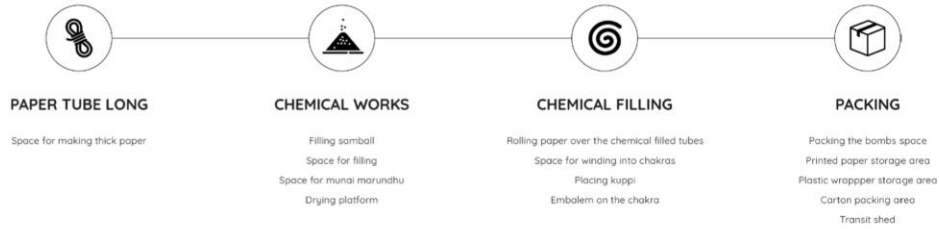
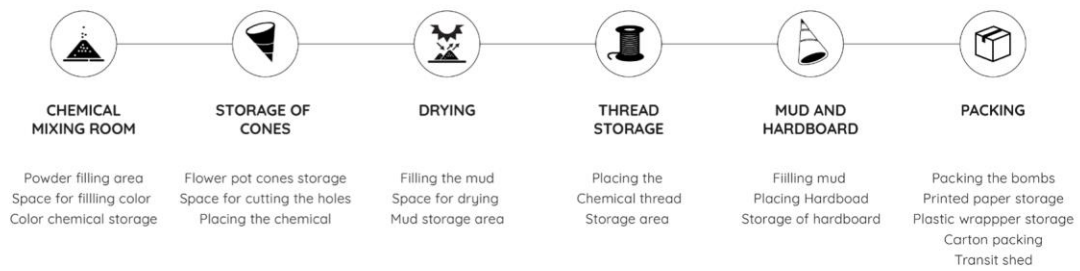


PLATE 6.1. 2 DETAILED FLOWCHART OF FIREWORK MAKING

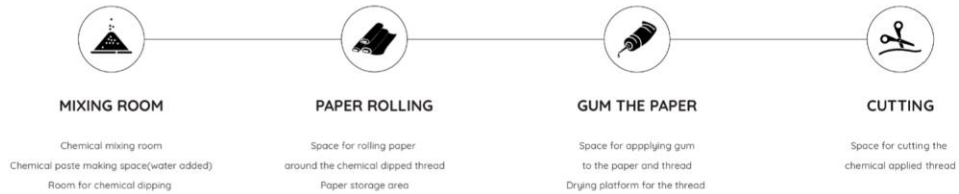
CHAKRAM



FLOWER POTS



THE CHEMICAL THREAD



***PLATE 6.1. 3 DETAILED FLOWCHART OF FIREWORK
MAKING***

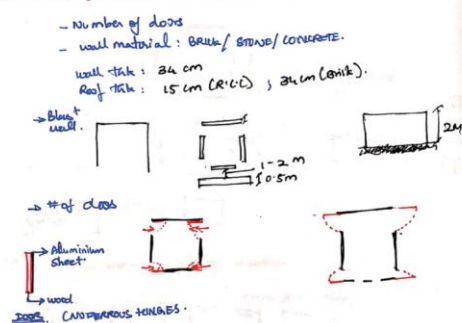
7. CODES AND STANDARDS

Norms and guidelines for extraordinary buildings

THE GAZETTE OF INDIA : EXTRAORDINARY

Mixing / Filling building

① MIXING / FILLING - SPEC. BUILDING:



The building shall be provided with adequate number of doors. The place of mixing/filling shall be dry. The mixing/filling building should have walls built of brick, stone or concrete.

Wall constructed of brick and cement to a thickness of 34 centimetres and the roof to a thickness of 15 centimetres of RCC

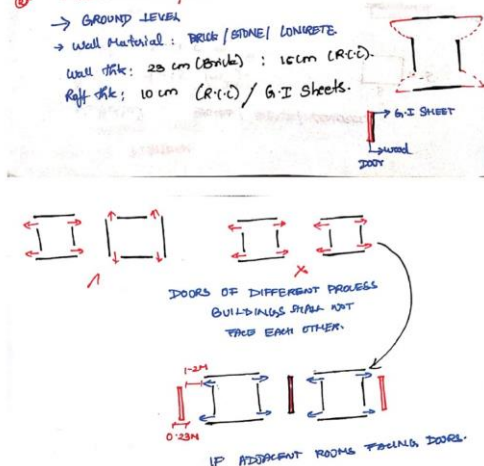
5 kilogrammes for white powder rooms and 12.5 kilogrammes for black powder rooms and the man limit shall be 2 numbers.

Three or four doors in two walls.

Lightning conductor provided as per IS 2309 of 1969 if mixing / filling is done by electrically operated machine.

Manufacturing / Process Sheds

② MANUFACTURING / PROCESS SHEDS:



The walls shall be of 23 centimetres thick with cement and brick or of 15 centimetres thick RCC

The roof shall be of G.I. sheets or 10 centimetres thick RCC.

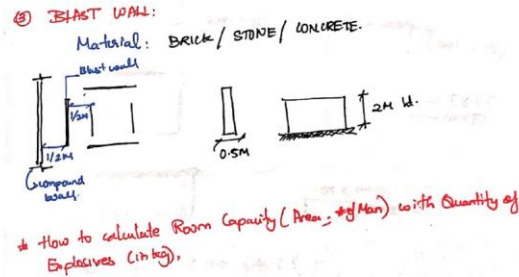
Four doors shall be provided.

The doors of different process buildings shall not face each other.

The shed shall have a floor of smooth finish.

PLATE 7.1. 4.1 NORMS AND GUIDLINES FOR EXTRAORDINARY BUILDING

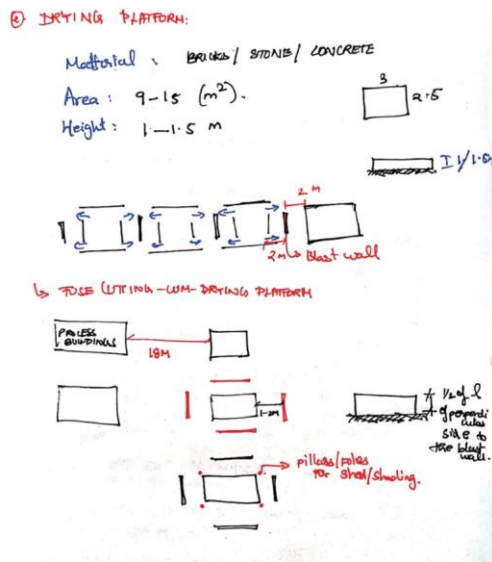
Blast wall



The blast wall shall be constructed at a distance of one to two metres from the door or from the boundary wall of the building.

The height of the blast wall shall be 2 metres and the width shall be 0.5 metre

Drying Platform



The drying platform shall have a platform of bricks, stone or concrete with a floor area of minimum 9 square metres to a maximum of 15 square metres. The height of platform shall be 1 to 1.5 metres.

Drying platform used for drying of sparklers may have a floor area on the ground filled with sand and lined with bricks or a floor area spread on the ground with stone jelly and cement.

Blast wall in front of such door of the said a blast wall shall be constructed in the intervening space at 1 to 2 metres away from any one of such platforms lying adjacent to each other.

Such platform may be built at a distance of 18 metres from process buildings and shall observe an outer safety distance of 45 metres.

Shall have a screen/blast wall at a distance of 1 to 2 metres from the platform, with a height equal to half of the length of the side perpendicular to the screen wall/blast wall. Temporary roof may be provided by erecting 4 pillars or poles if necessary for protection from direct sunlight.

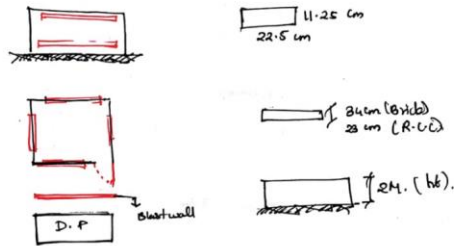
EXTRAORDINARY BUILDING

PLATE 7.1. 4.2 NORMS AND GUIDLINES FOR

Transit building

⑤. TRANSIT BUILDING:

Wall materials: Brick / STONE / CONCRETE
 Wall thk: 45 cm (Cement Brick); 15 cm (R.C.C.)
 Roof thk: 15 cm (R.C.C.).



It should have a cement brick wall of 45 centimetres thick and RCC roof of 15 centimetres thick.

The ventilators shall be provided at the top and the bottom of the walls as suggested by the licensing authority.

Door faces the drying platform or the door of any other process building, a blast wall (34 centimetres brick cement or 23 centimetres RCC) in front of doors at a distance of 1 to 2 metres. The blast wall shall be 0.5 metre wider than the door opening on both sides and shall have a height of 2 metres.

Magazine for storage of fireworks or safety fuse

⑥. MAGAZINE FOR STORAGE OF FIREWORKS / SAFETY FUSE.

Material: Brick / STONE / CONCRETE.
 Roof: G.I. / A.C. sheet.

Floor Area: $\rightarrow 2 \text{ M}^2 / \text{ton of Firework.} = (1000 \text{ kg} = 1 \text{ ton})$
 $\rightarrow 10,000 \text{ m of safety Fuse.}$
 $\rightarrow 16 \text{ M}^2 / \text{ton of Paper Caps / Ammos.}$
 $\rightarrow 168 \text{ M}^2 / \text{ton of Serpent Egg.}$



This calls for a construction which will resist illegal entry as much as possible and is well ventilated.

The magazine should have walls built of brick, stone or concrete.

The interior of the storehouse shall be kept clean and all benches, shelves and fittings shall be so constructed or so lined or covered as to prevent the exposure of any iron or steel and the detachment of any grit, iron, benches, shelves and fittings shall as far as practicable be kept clean and free from grit.

The ventilators shall be provided at the top and the bottom of the walls as suggested and the ventilators shall be 22.5 centimetres x 11.25 centimetres

The magazine shall have a minimum 12 mm red line painted on the interior walls at a height 3 metres from the floor level. This line indicates maximum height to which explosives may be stacked. The gang way space of minimum 30 centimetres shall be provided around the usable portion of the walls to provide air circulation

EXTRAORDINARY BUILDING

PLATE 7.1. 4.3 NORMS AND GUIDLINES FOR

EXTRAORDINARY BUILDING

Table of safety distances (in metres) for manufacturing factory, magazine of category "Y"

Quantity in kilogrammes	To and between magazines or magazine office etc	To and between process buildings	To railway, Road etc	To Dwelling Houses offices, factories etc.
3000	13	46	46	80
3500	14	49	48	86
4000	15	51	50	92
4500	16	53	52	98
5000	16	55	54	110
6000	18	58	57	117
7000	19	62	61	123
8000	21	64	63	128
10000	23	69	69	138
12500	26	75	72	149
15000	28	79	78	158
17500	30	83	82	167
20000	32	87	86	174
25000	36	94	93	187
30000	40	100	98	199
35000	43	105	104	210
40000	46	110	108	219
45000	48	114	113	228
50000	51	118	118	236
60000	56	126	128	251
70000	60	132	138	264
80000	64	138	148	276
90000	68	144	158	287
100000	72	149	168	297
112500	76	155	180	309
125000	80	160	192	320

Table-6
Safety distance (in metres) to be observed by various process and storage sheds of fireworks manufacturing factory

From	Explosives Limit in kilogrammes	Man Limit	To mixing/ filling shed	To dipping shed	To drying platform	To manu- facturing shed	To fuse wrapping shed	To transit shed (fireworks) of capacity in kilogrammes			Transit shed (quick match/micro cord/ fuse) of capacity in kilogrammes			To transit shed (pellet) of capacity in kilogrammes	To raw material shed	To dwelling house, protected works or out side safety distances
								300	400	500	100	150	200			
Mixing/filling shed	5	2	18	18	18	18	18	30	34	37	21	24	26	18	45	45
Dipping shed	5	2	18	12	18	12	12	30	34	37	21	24	26	18	45	45
Drying platform	25	4	18	12	12	12	12	30	34	37	21	24	26	18	45	45
Manufacturing shed	25	4	18	12	12	12	12	30	34	37	21	24	26	18	45	45
Fuse wrapping shed	10	2	18	12	12	12	12	30	34	37	21	24	26	18	45	45
Transit shed (fireworks)	300	2	30	30	30	30	30	30	34	37	30	30	30	30	45	45
	400	2	34	34	34	34	34	34	34	37	34	34	34	34	45	45
	500	2	37	37	37	37	37	37	37	37	37	37	37	37	45	45
Transit shed (quick match/micro cord /fuse)	100	2	21	21	21	21	21	21	34	37	21	24	26	21	45	45
	150	2	24	24	24	24	24	24	34	37	24	26	28	24	45	45
	200	2	26	26	26	26	26	26	34	34	26	28	30	26	45	45
Transit shed (pellet)	50	2	18	18	18	18	18	18	18	18	37	18	18	18	45	45
Raw material shed	X		45	45	45	45	45	45	45	45	45	45	45	45	X	X

Note:—The Transit building for semi-finished fireworks will have two compartments each of size 2.5 metres x 2.0 metres - one each for the storage of non-explodable items like wheel, flowerpots etc. and another for storage of explodable items like crackers, atom bombs etc.

TABLE 7.1 FIRE SAFETY DISTANCE

0	no. of persons	Quantity in Sq.	SPACE DIMENSION/AREA	TOTAL NUMBER OF UNITS	NUMBER OF PEOPLE	TOTAL NUMBER OF PEOPLE	TOTAL QUANTITY	TOTAL SPACE
WATCHMAN CUBICLE	3		3x2.5		3			12.5
TOILET FACILITY			1x1.5/1/ 3x2					
WATER FACILITIES for fire service aid								
EMERGENCY VEHICLE PARKING	7				7			
ESCAPE ROUTE REFUGEE AREA								
ADMIN								
OWNER'S CABIN	1		3x3		1			
FACTORY MANAGER'S CABIN			3x3					
GENERAL								
marketing	1				1			
quality	1				1			
production	1				1			
sales	1				1			
transport	1				1			
RECORD MAINTENANCE ROOM	1		2x2		1			
WORKER'S HAND ROLL SIGN AREA			8x5					
REST ROOM								
EAT AREA								
DISPLAY AREA								
DISPENSE MESH								
GUEST LOUNGE	20				20			
REST ROOM								
EAT AREA								
CANTEEN								
DINING AREA	50 PER DINING SPACE							
WASH AREA								
PAINTY	1							
SERVICE AREA								
REST ROOMS								
MEN								
WOMEN								
WORKER'S CLOAK ROOM								
LOBBY								
SECTION OF ROOMS BASED ON								
WORK								
LOCKER ROOMS-MEN	200							
WOMEN	160							
PPE CHANGE ROOMS-MEN	200							
WOMEN	160							
REST ROOMS-MEN								
WOMEN								
FIRST AID ROOM								
FACTORY MEDICAL OFFICER	2							
ROOM								
CONVERSION OF WARDS/HALL								
KEY PERSONNEL								
STANDBY TEAM ROOMS	5							
MEDICAL SUPPLY UNIT								
DRESSING ROOMS								
EMERGENCY CONTROL AND RESCUE CENTRE	4							
TEAM								
SITE MAIN CONTROLLER								
INCIDENT CONTROLLER								
COMMUNICATION OFFICER								
SAFETY & TECHNICAL PERSONS								
SMOKE DETECTOR CONTROL UNIT ROOM	2							
MONITOR ROOM	2							
DRY POWER CONTROLLER UNIT	2							
MAGAZINE	1	50,000	40x60				50000X1-50000	50000
CHEMICAL ROOM								
SULPHUR STORAGE ROOM	2	600	3.6x3	1	2	2	600	600
ALUMINIUM POWDER STORAGE								
ROOM							2	
CHARCOAL STORAGE ROOM							2	
BARIUM NITRATE STORAGE ROOM	2	1800					2	
VARIETY 1- SARAFAM VEDI								
CHEMICAL MIXING ROOM	2	5	3.6x3	2	2x2-4	4	5x2-10	10
			4 Side Wall= 23 cm (B&A/25 cm) (R.C.C.) Roof = 10 cm (R.C.C.)/ G.I SHEETS					10.8x2-21.6
CHEMICAL FILLING ROOM	2	5	3.6x3	2	2x2-4	4	5x2-10	10
								10.8x2-21.6
DRYING PLATFORM	25	3.6x3		2		2	25x2-50	50
								10.8x2-21.6
PROCESS 1- PAPER TUBES								
ROLLED PAPER TUBE STORAGE AREA	200	4x5		2			200x2-400	20x2-40
SPACE FOR FINING THE PAPER TUBES		1x1.5		4		4		1.5x4-6
SPACE FOR DRYING THE FINED PAPER TUBES		3.6x3		2				10.8x2-21.6
SPACE FOR CUTTING THE COLORED PAPER TUBES	2	2x2.5		1	2X1-2	2		5x1-5
SPACE FOR STORING THE CUT PAPER TUBES-ARRANGING THE CUT TUBES IN THE RING	2	3x3		1	2X1-2	2		6x1-9
SPACE FOR STORING THE RINGS WITH PAPER TUBES		1.5x2		1				3x1-3
PROCESS 2-FILLING MUD								
SPACE FOR FILLING THE BASE WITH MUD (DISCHARGING)	2	1.5x1		2	2x2-4	4		1.5x2-3
SPACE FOR DRYING		2x2		2				4x2-8
MUD STORAGE AREA	50	2x2		1			50x1-50	4x1-4
SPACE FOR MAKING HOLES AFTER SEALING THE RING'S TOP WITH PAPER	1	1x1.5		4	1X6-4	4		1.5x6-6
SPACE FOR STORING SAMBALL	100	2x2		1	2X1-2	2	100x1-100	4x2-4
SPACE FOR FILLING SAMBALL	2	2x2		1	2X1-2	2		4x1-4
PROCESS 3-CHEMICAL FILLING								
STORAGE SPACE FOR TUBES INLINE TO BE CHEMICAL FILLED		2x2		1				4x1-4
STORAGE SPACE FOR CHEMICAL FILLED TUBES		3x3.6		1				10.8x1-10.8
PROCESS 4-FILLING MUD								
SPACE FOR FILLING MUD AFTER CHEMICAL FILLING(VARMANN)	1	1.5x1		2	1X2-2	2		1.5x2-3
SPACE FOR MAKING HOLES AFTER SEALING THE CHEMICAL LOADED MUDDER RING'S TOP WITH PAPER	4	3.6x3		2	4X2-8	8		10.8x2-21.6
PROCESS 5- INSERTING THE CHEMICAL FINISHED THREAD								
SPACE FOR INSERTING THE FINISHED CHEMICAL THREAD INTO THE VEDI(FILLING ROOM)	2	5	3.6x3	2	2x2-4	4	5x2-10	10
								10.8x2-21.6

TABLE 7.2.1 AREA STATEMENTS

FINISHED THREAD STORAGE AREA (TRANSIT SHEET)	2	30	3.6x3			1	2x1+2		30x1+30	30	10.8x1+10.8	10.8
PROCESS 6- INKING												
SPACE FOR INKING THE BOTTOM OF THE RING AFTER INSERTING THE THREAD	1		1x1.5			1	1X1+1	1			1.5X1+1.5	1.5
DYEING AREA FOR THE INKED RINGS			3.6X3			1					10.8X1+10.8	10.8
PROCESS 7- FINISHING												
MANUFACTURING SHEDS- SPACE FOR TIEING THE CRACKER FOR MAKING WALA (MANUFACTURING SHED)	4	25	3.6x3			5	4x5+20	20	25x5+125	125	10.8x5+54	
TRANSIT SHED- INTERMEDIATE STORAGE AREA TO COLLECT THE FINISHED (TIED) WILAS	2	200	3.6x3									54
						1	2x1+2		200x1+200	200	10.8x1+10.8	10.8
PROCESS 8-PACKING												
SPACE FOR PACKING THE BULI VEDI	4	25	3.6X3			4	4X4+16	16	25X4+100	100	10.8X4+43.2	43.2
PRINTED PAPER STORAGE AREA			1X1.5			1					1.5X1+1.5	1.5
PLASTIC WRAPPER STORAGE AREA			1X1.5			1					1.5X1+1.5	1.5
CARTON PACKING AREA	4	25	3.6X3			2	4X2+8	8	25X2+50	50	10.8X2+21.6	21.6
TRANSIT SHED- STORING PACKED CRACKERS BEFORE LOADING INTO THE MAGAZINE	2	200	3.6X3			1	2X1+2		200X1+200	200		
											10.8X1+10.8	10.8
								77				405.9
VARIETY-2 BOMB												
PROCESS 1- CHEMICAL CUBE MAKING												
CHEMICAL MIXING ROOM	2	5	3.6x3			2	2x2+4	4	2x2+10	10	10.8x2+21.6	21.6
CHEMICAL CUBE MAKING AREA	2	5	3.6x3			2	2x2+4	4	2x2+10	10	10.8x2+21.6	21.6
PROCESS 2- WINDING												
SPACE FOR WINDING THE SAC THREAD AROUND THE CHEMICAL CUBE	4	25	3.6x3			3	4x3+12	12	25x3+75	75	10.8x3+32.4	32.4
space for linking the sac wound bomb												
SPACE FOR WRAPPING FOIL AROUND THE CHEMICAL CUBE	4	25	3.6x3			2	4x2+8	8	25x2+50	50	10.8x2+21.6	21.6
FOIL STORAGE AREA			1.5x1			1					1.5x1+1.5	1.5
PROCESS 3- INSERTING THE CHEMICAL DIPPED THREAD												
SPACE FOR INSERTING THE FINISHED CHEMICAL THREAD INTO THE VEDI FILLING ROOM	2	5	3.6x3			2	2x2+4	4	2x2+10	10	10.8x2+21.6	21.6
FINISHED THREAD STORAGE AREA	2	30	3.6x3			1	2x1+2		30x1+30	30	10.8x1+10.8	10.8
TRANSIT SHED- INTERMEDIATE STORAGE AREA TO COLLECT THE FINISHED BOMB UNITS	2	200	3.6x3									
						1	2x1+2		200x1+200	200	10.8x1+10.8	10.8
PROCESS 4-PACKING												
SPACE FOR PACKING THE BOMBS	4	25	3.6X3			4	4X4+16	16	25X4+100	100	10.8X4+43.2	43.2
PRINTED PAPER STORAGE AREA			1X1.5			1					1.5X1+1.5	1.5
PLASTIC WRAPPER STORAGE AREA			1X1.5			1					1.5X1+1.5	1.5
CARTON PACKING AREA	4	25	3.6X3			2	4X2+8	8	25X2+50	50	10.8X2+21.6	21.6
TRANSIT SHED- STORING PACKED CRACKERS BEFORE LOADING INTO THE MAGAZINE	2	200	3.6X3			1	2X1+2	2	200X1+200	200		
											10.8X1+10.8	10.8
								58				220.5
VARIETY 3- BULLET(SMALL-1.15INCH, BIG-2 INCH)												
PROCESS 1- PAPER TUBE												
ROLLED PAPER TUBE STORAGE AREA		200	4x5			2			200x2+400	400	20x2+40	40
SPACE FOR CUTTING THE COLORED PAPER TUBES	4		2x2.5			1	4X1+4	4			5X1+5	5
SPACE FOR STORING THE CUT PAPER TUBES-ARRANGING THE CUT TUBES IN THE RING			3x3									
SPACE FOR STORING THE RINGS WITH PAPER TUBES			1.5x2			1					6X1+9	9
						1					3x3+3	3
PROCESS 2- FILLING MUD												
SPACE FOR FILLING THE BASE WITH MUD (THOORAMANN)	2		1.5x1			2	2x2+4	4			1.5x2+3	3
SPACE FOR DRYING			2x2			2					4x2+8	8
MUD STORAGE AREA		50	2x2			1			50x1+50		4x1+4	4
SPACE FOR MAKING HOLES AFTER SEALING THE RING'S TOP WITH PAPER	1		1x1.5									
SPACE FOR STORING SAMBALL		100	2x2			4	1X4+4	4			1.5x4+6	6
SPACE FOR FILLING SAMBALL	4		2x2			1	4X1+4	4	100x1+100		4x1+4	4
											4x1+4	4
PROCESS 3-CHEMICAL FILLING												
CHEMICAL MIXING ROOM	2	5	3.6x3			2	2x2+4	4	2x2+10	10	10.8x2+21.6	21.6
CHEMICAL FILLING ROOM	2	5	3.6x3			2	2x2+4	4	2x2+10	10	10.8x2+21.6	21.6
STORAGE SPACE FOR TUBES INLINE TO BE CHEMICAL FILLED			2x2									
STORAGE SPACE FOR CHEMICAL FILLED TUBES			3x3.6			1					4x1+4	4
						1					10.8x1+10.8	10.8
PROCESS 4-FILLING MUD												
SPACE FOR FILLING MUD AFTER CHEMICAL FILLING(VAUMANN)	1		1.5x1			2	1X2+2	2			1.5x2+3	3
SPACE FOR MAKING HOLES AFTER SEALING THE CHEMICAL LOADED MUDDER RING'S TOP WITH PAPER	4		3.6x3									
						2	4X2+8	8			10.8x2+21.6	21.6
PROCESS 5- INSERTING THE CHEMICAL DIPPED THREAD												
SPACE FOR INSERTING THE FINISHED CHEMICAL THREAD INTO THE VEDI FILLING ROOM	2	5	3.6x3			2	2x2+4	4	2x2+10	10	10.8x2+21.6	21.6
FINISHED THREAD STORAGE AREA (TRANSIT SHEET)	2	30	3.6x3			1	2x1+2		30x1+30	30	10.8x1+10.8	10.8
SPACE FOR WRAPPING FOIL AROUND THE CHEMICAL CUBE	4	25	3.6x3			2	4x2+8	8	25x2+50	50	10.8x2+21.6	21.6
FOIL STORAGE AREA			1.5x1			1					1.5x1+1.5	1.5
PROCESS 4-PACKING												
SPACE FOR PACKING THE BOMBS	4	25	3.6X3			4	4X4+16	16	25X4+100	100	10.8X4+43.2	43.2
PRINTED PAPER STORAGE AREA			1X1.5			1					1.5X1+1.5	1.5
PLASTIC WRAPPER STORAGE AREA			1X1.5			1					1.5X1+1.5	1.5
CARTON PACKING AREA	4	25	3.6X3			2	4X2+8	8	25X2+50	50	10.8X2+21.6	21.6
TRANSIT SHED- STORING PACKED CRACKERS BEFORE LOADING INTO THE MAGAZINE	2	200	3.6X3			1	2X1+2		200X1+200	200		
											10.8X1+10.8	10.8
								70				302.7
VARIETY 4- CHAKRAM												
PROCESS 1												
SPACE FOR MAKING THICK PAPER TUBES LONG	8		4x5			1	8X1+8	8			20x1+20	20

TABLE 7.2.2 AREA STATEMENTS

PROCESS 2-CHEMICAL WORKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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TABLE 7.2.3 AREA STATEMENTS

8.FINAL SHEETS

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