The Changing Dynamics of Brick Kiln Product Markets: A Case Study of Telangana

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IN

ECONOMICS

BY

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CERTIFICATE

This is to certify that the dissertation entitled **"The Changing Dynamics of Brick Kiln Product Markets: A Case Study of Telangana"** submitted by **Siriman Naveen** bearing Regd. No **13SEHL17** in partial fulfilment of the requirements for the award of Master of Philosophy in Economics is a bonafide work carried out by him under my supervision and guidance.

I declare to the best of my knowledge that no part of this dissertation is earlier submitted for the award of any research degree or diploma in full or partial fulfillment in any other university.

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DECLARATION

I **SIRIMAN NAVEEN** hereby declare that this Dissertation entitled **"The Changing Dynamics of Brick Kiln Product Markets: A Case Study of Telangana"** submitted by me under the guidance and supervision of **Dr.G.Vijay** is a bonafide research work. I also declare that it has not been submitted previously in part or in full to this University or any other University or Institution for the award of any degree or diploma.

Date:

Place: Hyderabad

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Dedicated

To

Grand Mother and Parents

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By

SIRIMAN NAVEEN

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ABBREVIATIONS

AAC	:	Autoclave Aerated Concrete
ACC	:	Autoclaved cellular concrete
APIDC	:	Andhra Pradesh industrial development corporation
APIIC	:	Andhra Pradesh Industrial Infrastructure Corporation
BFSI	:	Banking and Finance Insurance
BHK	:	Bed Room Hall Kitchen
BJP	:	Bharathiya Janatha Party
BTKT	:	Bull's Trench Kiln technology
BPPA	:	Buddha Poornima Project Authority
CAGR	:	Compound Annual Growth Rate
CBD	:	Central Business Districts
CBI	:	Central building Institution
CDA	:	Cyberabad Development Authority
CLC	:	Cellular Lightweight Concrete
CMC	:	Computer Maintenance Corporation
CPB	:	Central Polluting Board
CRISIL	:	Credit Rating Information Services of India Limited
DMIC	:	Delhi- Mumbai industrial corridor
ECR	:	East Coast Road

EPIP	:	Export Promotion Industrial Park
EWS	:	Economically Weaker Sections
F&B	:	Food and Beverage
FDI	:	Florien Direct Investment
FSI	:	Floor Space Index
GDP	:	Gross Domestic Product
GFC	:	Global Financial Crisis
GST	:	Good and Service Tax
GST	:	Great Southern Trunk
HADA	:	Hyderabad Airport Development Authority
HMDA	:	Hyderabad Metropolitan Development Authority
HMR	:	Hyderabad Metropolitan Regions
HUDA	:	Hyderabad Urban Development Authority
ICICI	:	Industrial Credit and Investment Corporation of India
IT	:	Information Technology
ITeS	:	Information Technology Enable Service
ITIR	:	Information Technology Investment Region
JNNURM	:	Jawaharlal Nehru National Urban Renewal Mission
KPMG	:	Klynveld, Peat, Marwick, Goerdeler
LIG	:	Low Income Groups
MHUPA	:	Ministry of Housing and Urban Poverty Alleviation

MIG	:	Middle Income Groups
MMR	:	Mumbai Metropolitan Region
MoEF	:	Ministry of Environment and Forest
NCR	:	National Capital Region
NHB	:	National Housing Bank
NH-2	:	National High way
NICA	:	National Industrial Corridor Authority
OMR	:	Old Mahabalipuram Road
ORR	:	Outer Ring Road
PBD	:	Peripheral Business Districts
PPP	:	Public Private Partnership
RBI	:	Reserve Bank of India
REMFs	:	Restate Mutual Funds
SBD	:	Secondary Business Districts
SEZ	:	Special Economic Zone
TERI	:	The Energy and Resources Institute
TMC	:	Thane Municipal Corporation
TSIIC	:	Telangana State Industrial Infrastructure Corporation
UNDP-GEF	:	United Nations Development Program -Global Environment Facility
VSBK	:	Vertical Shaft Brick Kiln Technology
REITs	:	Real Estate Investment Trust

Chapter-1

Introduction and Review of Literature

1.1 Introduction of Brick Industry

The word 'brick' originated in late middle English: from Middle Low German, Middle Dutch 'bricke', probably reinforced by Old French 'brique', of unknown origin or 'briquette', which means a block of compressed coal dust or peat used as fuel-origin late 19th century: French diminutive of brique brick.[1] The antiquity of bricks can be pushed back to the ancient times. In Sanskrit it was known as 'Aishtakam'. Brick industry is the oldest industry in the history of mankind, it can be said that it is only manmade material that has defied time gracefully even though it was invented 5000 years ago. It is reported that hand dried, sun-dried mud bricks were made and used during the pre-pottery Neolithic period way back 10000B.C.[2] Ever since man realized the housing as basic need, he started using bricks in various forms like green bricks, sun dried bricks and the fired bricks.

1.1.1 Brick kilns- Global Scenario

Brick has been in use as main construction material all over the world in every class and kind of building. As per the 2007, estimates of Clean Air task Force production, the brick production has been dominated by few Asian countries such as China, India, Pakistan and Bangladesh. China had occupied the first place with 54% of the total production, India was in second with 11%, Pakistan in third place with 8% and Bangladesh in the fourth place with 4% of total production. The recent year 2015 estimates of Anil Agarwal (Center for Science and Environment) shows that there has been an increase in overall production of the brick.

[1] The New Oxford English dictionary, III Impression, London, 2001, pp.224-225.

[2] http://*www.brickindia.com*

Table1.1.Global brick production

Country	Production %	Billion Per annum
China	66.6%	1000
India	13.33%	200
Pakistan	3.00%	45
Vietnam	0.40%	25
Bangladesh	1.13%	17
Nepal	0.40%	7
Rest of Asia	0.47%	6
Total Asia	86.67%	13,00
UK	53.00%	8
US	37.00%	4
Australia	13.00%	2
Rest of World	12.40%	186
Total Rest of World	13.33%	200
Total production	100.00%	1,500

Source: Anil Agarwal 2015: overview of Brick Kiln Industry Pollutions and Technology where we need to go?

The table above clearly shows that brick kiln production has been expanding rapidly in China and India; there was 12.6% increase in the production of brick in China of total world production, which is 800 to 1000 billion, where as in case of India it increased to 2.33%, which is almost 140 billion to 200 billion brick production. The Asia's overall production has increased from almost 77% to 86.67% of total production.

1.1.2 Indian scenario

Indian Brick Kiln industry is the second largest producer in the world after china, as per the 2009 estimates production has been increasing annually from 5-10% due rapid expansion of the urbanization and real estate sector. India estimated to have more than

145000 registered and unregistered brick kilns; producing more than 236 billion bricks.[3] The main cost components of these industries are labour, coal, land, mud, rent and electricity; since it is the largest consumer of coal after the power and thermal sector, it is consuming around 25 million tons every year. Indian brick kilns expanded their capacity of production from 140 billion in 2007 to 200 billion in 2015, almost 13.33% in the total world production. It consumes 350 billion tons of clay; employing 10 million people, which is twice to the China's brick kiln but ten times lower than the China's employee production capacity.

1.2 Technological development programs in brick kilns

Despite brick industry's huge contribution to real estate sector, employment, role in urbanization, impact on health and environment, it had experienced some development programmes in order to reduce environmental damages, upgraded the technologies to increase the efficiency and production of brick kiln. The important government involvements were; the environmental regulations legislated in the 1990's, which led to upgradation in the firing technology from moving chimney bull trench kilns to fixed chimney bull trench kilns.

[3] http://pscst.gov.in/pscstHTML/brick.html

Table: 1.2 Development programs in Indian Brick Kiln Industry

Year	Agency	Type of development involvement	Result
1970s	CBRI[4] of Govt of India	Initiated technical development program by introduction of zigzag firing technology and semi mechanization process	1.No large-scale implementation. 2. But succeeded in planting technologies
1990s	CPCB/MoEF[5]	Enacted regulations to control emissions from brick kilns	Around 30,000 moving chimney bull trench kilns technology followed brick kilns shifted to more efficient technology used fixed bull trench chimney technology.
1990-2004	Swiss agency for development and cooperation	Initiated technical development program VSBK[6]	1.No large-scale implementation. 2.But succeeded in planting technologies
In 2009	UNDP-GEP[7]	Initiated technical development by introducing efficient bricks such as Hollow bricks	Not known

Source: Greentech Knowledge Solutions Analysis, pg no,06.

[4] Central building Institution, government of India.

[5] Central Polluting Board Ministry of Environment and Forest.

[6] Vertical Shaft Brick Kilns.

[7] United state Development Program-Global Environment Facility.

1.3 Hyderabad brick kilns

Hyderabad brick kilns are providing employment opportunities to nearly 4 lakh people, they are migrates from various states, especially most of them are Odhisa. These brick kiln are situated at the outskirts and rural urban places around the city. Hyderabad brick kiln are well reputed for violation of laws similar to other states' brick kilns. The average production of the brick workers varies around 700 to 1000. The lack of employment opportunities at home, poverty and debt are pushing them to brick kilns. Hyderabad brick kilns are following advance payment system; making most of the labour in the end empty handed. These workers are brought in from the districts of western Odisha by a large network of contractors under conditions of bondage and semi bondage. These workers face severe exploitation; being paid a meager of Rs.200 for 1000 bricks, whereas the minimum rate set by government being Rs.387; they experience inhuman working hours from 4 a.m. to 8 p.m. Child labour, physical and sexual harassment is rampant. In addition to these, abolition of fundamental rights at work such as, social securities act and right to life with dignity, right to assemble, right to unionize, right to protection against violence is the common feature of this industry.

1.4 Significance of Brick Industry

In any country, construction accounts for about 60 per cent of the plan outlays all over the world. Out of this, bricks account for more than forty per cent. Brick manufacturing has become important in the context of providing shelter, which is an important basic human need next to food and clothing. Besides shelter, bricks are being used in the development of infrastructure such as construction of dams, canals and business houses which are needed for improvement in the levels of living of the people everywhere.

Brick manufacture is a traditional unorganized industry, mostly reserved to rural and semi urban areas. It is one of the prime employment creating industries, employing millions of workers. Brick, being one of the most ancient building materials; is generally consumed at present as a primary input in construction because of its strength, quality, dependability, ease and simple accessibility.

Brick industry, which is essentially a labour intensive industry, provides employment opportunity to a vast work force of around several millions of people in India.[8]The brick kiln as a rural oriented; offers direct employment to crores of poor families and indirect employment to several lakhs of people. Bricks play a vital role in the modern day construction. Being an important building material, bricks are widely used by the human race. As large scale construction of high rise housing and business complexes gained momentum, modern architecture and usage of various building materials such as bricks become inevitable.[9] Brick kiln enterprises especially in Indian context do not have an accessibility to the institutional finance such as bank, hence most of the finance operations are carried out of own money, family saving, borrowing from relatives, friends and private money lenders.

12th Planning commission also noticed the importance of infrastructure development and allocated large amount for it and construction sector is also expanding rapidly (annual growth rate 9%). Due to population pressure and rapid urbanization, the number of brick kilns is set up in the outskirts of the cities and towns. Most of the brick kilns are run in small scale unorganized sectors, therefore, the brick industry is the back bone of the infrastructure and construction sector. Some of the studies showed that the owner of the brick kiln shut down due to high interest rates on initial capital, rent on land, lack of inputs like mud, labour, high risk involved at time of production due to sudden rains and other labour problem, lastly the production activities cannot be possible in rainy season, and target has to reach within limited time.

1.5 Review of literature

From the above mentioned introduction and significance of the brick kilns, it can be clarified that the industry's development and expansion is closely associated with rapid population growth and urbanization and especially the Production of bricks is the backward end supply chain of the Real estate sector. The structure and composition of

[8]1Report of the Second *State Conference of Tamil Nadu Bricks and Tiles Manufacturers Association* held at Tirunelveli on 24th June 2004.

[9]Report of *National Seminar on High Volume Flux Bonded Building Bricks* held at Angamaly, Ernakulam District on 30th May 2006.

the brick kiln industry with reference to the scale, technology, raw materials, as well as the marketing agents and strategies are in essence derived from the nature of development of the Real estate sector. It is crucial therefore to have a perspective about urbanization and the Real estate sector.

The phenomenon urbanization has closely related and interconnected to modernization and industrialization. The common definition of the urbanization is a population shift from rural to urban areas for many purposes may be for employment, education, better salary, access of better living standards, etc. "the gradual increase in the proportion of people living in urban areas", and the ways in which each society adapts to the change[10]. The urbanization which is expanding rapidly has its roots in the globalization, industrialization and capitalism. India witnessed the uneven urban development; the expansion of urbanization is forcefully excluded the people from befits of urbanization. The many undesired social, economic changes have been taking place like land Mafia, violations of rules, exploitation of vulnerable, force full and illegal occupation of land.

With this little background it clearly states that there has been expansion trend in the urbanization world-wide. But this is an uneven development across world. In case of the developing country like India, there is an unequal development within mega cities, middle urban centers and small towns. The World Bank annual report (2010) clarified that cities in India fail to observe the people within cities and migrates in case of the employment opportunities, interestingly the small cities are observing and including more migrates than the megacities.

According to Amithab Kundu (2000) big urban cities or mega cities are strategically excluding the rural migrants and urban poor from the benefits of urbanization, One can thus postulate that exclusionary urban growth owing to negative policy perspective on migration and increased un-affordability of land and basic amenities by the rural poor have led to deceleration in urban growth. And he says urban centers and mega cities are pushing urban poor to the peripheral or outskirts. At the same time industries are launching at outskirts of the cities due to unaffordable land prices in the mainland of the

[10]https://en.wikipedia.org/wiki/Urbanization

urban Center and appropriating and enjoying the benefits by easily violating rules and legalities however, the peripherals has been neglected since the poor resides there.

Kundu in his work critically examines government participation in urban development through decentralization, 74th amendment shifted governing of urban cities to the local municipal administration. It led to disparities between the cities where small and medium urban centers are unable to raise funds due to their low and uncertain resources and domestic private and foreign investment also could not fill the gap of infrastructure development because these cities have low level of infrastructure facilities and other basic amenities, making them unable to attract the investment project. The financial capital with in the country and from outside (FDI) is flowing into the mega cities and big urban centres, it is building ultra-model cities which are enabling the elites only to afford, in such cases many of the slum areas are expelled from center of the cities to outskirts, which made them impoverish and could not provide employment.

Chimoyee Malik (2009) in his work asserted the impact of the urbanization on the peripheral village economy especially on land. The unaffordable land prices have forced some of the industries to base in peripheral villages, around cities and these industries have been encroaching agriculture land for industrial purposes and increased tremendous stress on production of agriculture as well as employment opportunities of peripheral villages. At this juncture the study also focused on the workforce that has got affected due to urbanization. There was a steep increase in the growth of non-workers within the age group of 15-59 years in the agricultural sector.

David Harvey (1985) in his renowned work critically examined the rapid growth of urbanization, he says urbanization, property capital, generally (capital) are expelling so many people, in many cities. The capital (condition with in capital) leads to certain strategy of development, to survive in societies it must endlessly grow with the inherent idea of profits at the end of the day. The capital in society is expanding in cumulative or compound growth rate. The idea of endless growth is a serious problem. Expansion of the financial capital strategically reduces the role of government; it makes the rich much

richer and poor much poorer. The capital which has entered into the urbanization is a profit oriented and is building the cities for the elite and upper class only; it has been building the cities for the want of capital. This capital loves the mega cities and stadiums which give high profits and a kind of cities the rich aims to reside, generally of high value housing for limited market. Over production and expanded capital built speculative capital for upper class. Mega projects in principle PPP are formed, where public take whole of risk; private takes whole of the profits. The cities are being used again and again in the purpose of endless capital accumulation.

Real estate has been perceived as a very good opportunity to utilize capital or investment properly for both long and short-term investments. It is perceived to be relatively safe and is expected to fetch high profits or returns on investment as compared to the more unstable returns, which come from either the stock market or the very small and limited returns from bank deposits. According to the free encyclopedia definition real estate is a 'Legal term that comprises land along with anything permanently fixed to the land, for example buildings'. To elaborate further, real estate, which is also defined as the immovable property or even realty, is frequently deemed identical with real property comparison to personal property.

To be exact, real estate is not characterized by such physical components as land and buildings. Moderately, real estate is firmly synonymous with real property, the rights that associated with land and together with the fixtures, for intense roads and buildings that are always connected to the land.

During 2002 when the real estate market was progressing towards an expansionary phase wherein increasing populace, rising income levels, rapid expansion of urbanization have all contributed to the growth of Indian real estate market. Some of the important characteristics of the Real estate economy are that the Real estate is a form of asset with limited liquidity in relation to other investments, it is also capital intensive and is prominently cash flow dependent. If these factors are not well comprehended and managed by the investor, real estate turns out to be a risky investment. The study of investors behavior reveals that different factors impact their invest portfolio in the real

estate market. The significant role that Real estate development has played in the economic development has been recognized by scholars.

Bharat Mittal, 2007 maintains that the Indian real estate investment area has witnessed incredible progress over the most recent couple of years as a consequence to the global and local factors. With the growth and enlargement of the real estate market, other areas experienced the growth, which assisted and generated the growth of the economy.

Gill,A, S.P Sharma, H.S Mand, N. Mathur, 2012 argue that globalization and expansion of new Multinational Corporations in India resulted in the expansion of real estate market and economic growth. Also, growth of populace, rise in pay level, rapid growth of urbanization are the factors that affected the growth of Indian real estate market. Since the Indian real estate market is developing market in an under developed economy, the role of real estate investors play a crucial part of Indian economy.

K. Byrne (2005) explains that investors take better investment decision with the help of better investment knowledge and experience. The investors can precisely perceive the risk and the returns accumulating from the investment portfolio.

As a middle man, the real estate agent immediately makes use of a seller's property data for sale; offers various listing services to gain the competitive advantages in the real estate market. All services are then conjoined with effective marketing tools like advertising, which in turn help to increase the rate of arrival of potential buyers, who are better informed and thus better matches the seller's real estate property, causing a higher offers and profits.

Slovic, 1972; Alfredo and Vicente, 2010, Investment practices are characterized as how the speculators judge, figure, investigate and audit the systems for choice making, which contains information gathering, psychology, characterizing and comprehension, exploration and investigation. The entire procedure is called "investment behavior. The factor that affects the property investment behavior is that not all investment is

unintentional. Investors make investment decisions with a purpose to hold the property for either long term or short term. In short, literature review recognized that behavioral factors such as neutral Information, motivation from advisers, investment knowledge, investment risk and over expectation, influence the investors to invest in the real estate market.

According to the Common floor research 2014 the real estate sector has been encountering many barriers since 2014 which impacted the real estate sector intensively. The RBI rendered helping hand in financing this sector by lowering of interest rates on home loans, unveiling of 'Make-in-India' campaign, framework for Real Estate Investment Trust (REITs) and moderation of norms through foreign direct investment in construction sector. This research has presented 15 major trends which likely affects and shapes the real estate sector in 2015. One of them is the preferred property type, now residential plots are the utmost preferred property types and it indicates that buyers are investing with mid to long term. This trend has been growing up and justified by the development of smart cites and city outskirt developments.

At the same time large projects gain importance especially in south India, it can be observed that large projects are launched with over 1000 units and above. Chennai and Bangalore have launched such projects immensely, when compared to those finished previously. The momentum of growth of such projects at the outskirts of the city is spurring the lack of social infrastructure development. These large size projects are also launched at the center, north and south of these cities. Most of the projects with large units fall under the luxury segment. Thus, as per the BHK configuration, 3, 4 and 5 BHK units are prominent.

The recent new government has started heritage cities' development programme. Such cities have historical importance and the government's commencement of development in these regions, boosted the real estate sector growth. The industrial corridor anticipated to grow very fast in India, as each corridor passes along several existing industrial clusters, towns and cities; these are likely to become investment hubs and the government is also a part of it, having established National Industrial Corridor Authority

(NICA) for industrial corridor development. These industrial corridor cities are now the hub for the real estate sector.

The new and recent move of the construction agencies towards the affordable houses can be noticed and the BJP government also promised in its manifesto *"Housing for all by 2022".* In 2014 July the RBI has also redefined the definition of the affordable houses, according to RBI, the adjusted home loans is up to Rs 50 lakh in metropolitan cities and Rs 40 lakh in non-metro cities which will now come under the purview of affordable housing[11]. The big and well known construction agencies such as Tata Housing, Supertech, and Mahindra Lifespaces are launching affordable projects in major metro cities.

National Capital Region (NCR) is now the hot spot for the real estate development with in this region Faridabad has been evolving for possessing affordable place for industrial, residential and commercial development and facilities. It is being developed as a self-sustained; sub-city with malls, tall buildings, wide roads, commercial centers and educational institutions. Plans of extending the Delhi metro to the city to ease and convenience, less time consumption to travel between Faridabad and Delhi are taken into consideration. This city has an advantage, since it is surrounded by Noida, Greater Noida, Gurgaon and Delhi and has connectivity of NH-2 with the other cities such as Mathura, Agra and Palwa.

The project's amenities also impact on the real estate sectors. The analysis of Plan India scenario (2014) clarifies that more buyers prefer to have basic amenities than the ultra-luxuries. And south India tops in demanding such basic amenities and incidentally, above 85% of the projects in south India has these features. Especially in Chennai and Bangalore the residents of such houses are professionals within the age groups ranging between 30 and 40 years and the recent survey shows that they have children aged between 1and 7 years, hence this led them to demand play grounds and high- security, gym and other amenities.

[11] Common floor research-2014, pn:03

Research also clarified that in Northern India, buyers are attracted towards open spaces. As apartments lack sufficient space for kids to move around freely, play ground is also considered as an essential amenity. Inactive lifestyle has made consumers more health conscious. Consequently, to be fit and healthy, sports amenities like basket-ball court, tennis court, well equipped gym are also gaining grounds here.

Tendency towards small houses "*Small is beautiful*" recent survey shows that the maximum people are preferring the small size between 800-1200 square feet house, since the maintenance charges would be less and can be availed at an affordable price. Interestingly, the builders are also reducing size of the apartment by removing multiple balconies. Buyers, on their part, are more than happy to adapt to this change and are gratified with just one balcony which is more of a need-based rather than a luxury.

The survey shows that in this recent emerging trend of smart cities, the buyers have ignited interest towards the new cities and it can be observed that there is an increasing boom around the major cities and smart cities. In the case of oversupply of the commercial and residential buildings, Bangalore tops in the list with availability of nearly 60 per cent of the overall supply, followed by Pune with 36 per cent and Chennai with 31 per cent.

Trivita Roy and Akshit Shah Researchers at the Jones Lang LaSalle in their report (2014) noticed a new trend in Indian real estate market, according to this report, India is unique and there are several built in complexities for development, real estate business is not an exception for it. The real estate sector is an integral part of all the businesses having developed as a big sector and contributing as the second largest sector after agriculture by directly or indirectly linking to several sectors. The performance and development of the real estate sector depends on the growth of economy and business in particular. The real estate sector has been affected severely by the government policies and laws. The recently approved real estate bill is a crucial initiative by the government to deal with the concerns of real estate sector and also another important bill, Land

Acquisition and Rehabilitation and Resettlement approved by the government, is another step towards regulating the real estate sector. Despite such moves, still the information asymmetry and slackness in disclosure of norms need to be dealt for optimum and potential growth of the real estate sector, which is moving steadily and slowly.

As an asset class, real estate sector requires specific abilities, particularly the developing countries such as India want higher degree of steadiness before going into property agreements, one needs to understand the issues associated to the ownership rights of the property, comprehend the difference between the usable area and saleable area, working under conditions of nonexistence of ; institutionalized definitions, time bound completion of project and receipt of the completion certificate et cetera.

Amidst complexities and uncertainties as explained above, it can be noticed that there is lot of difference between the global financial crisis (GFC) period and post GFC. Prior to the GFC in 2008 there was a robust growth in the real estate sector, especially in north India. The post GFC has crushed all sectors of the real estate, absorption levels and the property prices showed a marked correction across all major real estate markets in India. The recovery of the real estate sector is led by the residential sector and there is gradual recovery in the office sector. At this juncture the post GFC period has suffered as a consequence to both the factors viz., low level of absorption in residential constructions and increased cost of construction, causing difficulties for the developers. In such a situation security of the invested capital returns through capital appreciation has become a big priority.

The post GFC has boosted the demand for the sub markets, which have been developing as a self-sustained eco system with all round development. And these sub markets' development and growth depend upon well supported infrastructure development. This hotspot for real estate sector cannot sustain without all round development. Mere development of residential, excluding the entertainment and commercial developments cannot be considered as all round development. This study identified some major locations of sub market development.

Noida & Greater Noida – National Capital Region (NCR)

Noida and Greater Noida are located in the state of Uttar Pradesh and are part of the National Capital Region (NCR). They developed as main IT hubs of Delhi NCR region after Gurgaon in the most recent decade. Noida and Greater Noida were wanted to unburden some clogging weight on Delhi. Noida is conventionally an industrial hub and an arranged format transformed into an IT center point in mid-2000s. As an industrial hub Noida effectively experienced residential and retail advancements inside its arranged format. Notwithstanding, the surge up of IT industry in this submarket changed the skyline of Noida as it experienced vast scale infrastructure developments alongside overall real estate developments. Noida and Greater Noida saw advanced connectivity with Delhi with the augmentation of road network and metro rail line. Noida and Greater Noida recognized the biggest number of residential units launched in the country in late three years.

Rajarhat – Kolkata

Rajarhat is a satellite city, arranged way back in 1990s. According to the master plan, it was supposed to be no less than three times bigger than Salt Lake City, a neighboring well-established destination. Amid the period somewhere around 2003 and 2008, Rajarhat witnessed a ton of interest and enthusiasm from different national and regional developers; on the other hand, post GFC, most of the plans either got slowed down or pace of execution decreased significantly. In past two to three years, construction activity and rentals have begun picking up once again, despite the fact that it is at a slower pace.

Viman Nagar and Nagar Road – Pune

Viman Nagar and Nagar Road lies in the eastern corridor of Pune and is in close nearness to the international airport. The location is mostly residential focused with a few IT/ITeS office improvements. This location has found expanded support because of the IT related developments in surrounding submarkets for instance Magarpatta, Hadapsar and Kharadi. With reasonable property prices, good road connectivity, built

social infrastructure and proximity to IT/ITeS office space, this area has drawn diverse classes of purchasers.

Navi Mumbai – Mumbai Metropolitan Region (MMR)

Navi Mumbai is one of the biggest planned townships in the world. With a perspective to decongest Mumbai, development planning of Navi Mumbai had begun in 1971. The region started getting renowned as a destination for the white color population who were incapable to afford houses within prime Mumbai or was not quick to move towards in the augmented western rural areas of Mumbai i.e., Dahisar to Virar. In appropriate time course, by advantage of great connectivity with Mumbai via road and rail, coupled with moderately affordable price points, it began inviting different classes of buyers. While, commercial office development is majorly limited to the IT/ITeS industry, the report believes that with the current concentration on fast development of infrastructure projects, this submarket has the potential to become an even more favored commercial destination going forward.

Whitefield – Bangalore

Whitefield is the eastern suburban IT center of Bangalore. It is the utmost preferred IT and residential suburb of Bangalore. Traditionally a residential suburb, Whitefield saw quick growth with the rise of IT sector in the submarket in mid-1990. The beginning of India's first information technology park, Export Promotion Industrial Park (EPIP), changed the horizon of Whitefield over the last decade and a half. Great connectivity and accessibility of social infrastructure attracted general development of Whitefield as IT companies, searching for large volume of space opened their offices. Moreover these developers launched residential projects, hotels and malls in this submarket.

Thane – Mumbai Metropolitan Region (MMR)

Located to the north-east of Mumbai, Thane was the host to India's first ever train connectivity route. Thane has experienced a transformation from being an industrial town with reasonable residential housing to a now-favored IT and moderately upmarket residential destination. Several infrastructural activities by the government were

executed under the sponsorship and guidance of the nodal development authority. Thane Municipal Corporation (TMC) had greatly improved the connectivity of Thane to the major business hubs of Mumbai and Navi Mumbai.

Southern Suburbs – Chennai

The southern suburb of Chennai which covers the prime corridors along the Great Southern Trunk (GST) Road, Old Mahabalipuram Road (OMR) and East Coast Road (ECR) has been seeing brisk development over the late year. The growth in IT/ITeS sector has cleared the path for overall progress of these regions as it witnessed the development of great scale residential townships from both national and local developers. The key territories in the submarket are Pallikaranai, Medavakkam, Chrompet, Tambaram, Thoraipakkam and Sholinganallur.

Gachibowli – Hyderabad

Gachibowli submarket consolodates Gachibowli, Nanakramguda, Manikonda, and Raidurg and surrounding territories. It is the following prominent IT/ ITeS destination of Hyderabad after Hitech City. Gachibowli is situated at a distance of 6 km from Hitech City and most part houses IT campus developments and IT SEZ developments. The IT related developments in Gachibowli began with CMC, set up its grounds in late 90s and Microsoft opening its first grounds in India in mid 2000s. The IT related developments expanded their foot-shaped impression in this submarket further as the Andhra Pradesh Industrial Infrastructure Corporation (APIIC) (now TSIIC) assigned land to financial companies at the Financial District at Nanakramguda which wanted to attract banking and finance companies (BFSI) to Hyderabad. Companies such as ICICI, Franklin Templeton, UBS (now Cognizant), Institute of Chartered Accountants, Andhra Bank, Andhra Pradesh State Financial Corporation, APIDC (Andhra Pradesh industrial development corporation) Venture Capital, ISB, DLF (major real estate company) and so forth are existing in the Financial District. As connectivity of Gachibowli begun enhancing, the submarket witnessed IT campus developments, IT SEZ developments took after by residential and hotel development. Retail is presently restricted just to high roads as there are no shopping centers operational in this sub-market at present.

Indian government has been taking critical measures to endorse the development in manufacture sector. Among the most noticeable is the 1483Km long Delhi- Mumbai industrial corridor (DMIC) which is required to essential boost to industrial real estate. The corridor is connected to seven states in northern and western India through a multi-modal high axle load dedicated freight corridor. With technical and financial support and assistance from government of Japan, DMIC would witness development of about 11 industrial regions. Similar corridor also planned to connect Amritsar to West Bengal (north to east) and Chennai to Mumbai (south to west).

Soumya Ranjan in paper 2013, presented outline of Indian real estate sector according to her work, after tremendous growth of the residential sector in 2011 and 2012, it had faced the decline in sale especially in the NRC and Bengaluru and Mumbai metro cities. Developers have been encountered the high input cost and interest rate and shrinking profit margins. The slowdown in the demand for luxury has witnessed and restricted to some places and at the same time there has been growing demand for the affordable houses at the peripheral of cities.

Major cities observed are almost130 million sq.ft. of investment grade residential space, this was launched by developers in the country in 2012. Keeping the momentum in 2013, about 70 million sq. ft. of investment grade residential space has been launched in key cities specifically the National Capital Region (NCR), Mumbai, Chennai, Hyderabad, Bengaluru, Kolkata etc.[12]
In case of the capital value of the major cities, stagnation has also been witnessed because of the oversupply of residential houses than the demand.

As in the case of the residential sector commercial sector was also affected by the economic slowdown in 2012, it has stagnated and witnessed the oversupply since there is lack of demand of commercial space. NCR, Mumbai and Bengaluru remain to be the leading cities accounting for more than 75% of the entire space getting absorbed. The

[12]E Y research

significant market in India (NCR, Mumbai, Chennai, Bengaluru, Pune and Hyderabad) witnessed nearly 22 million sq.fts. even in the first six months of the 2013 but only 14 million sqft is recorded as absorption. This is exerting extensive stress on the prevailing rentals across various micro-markets in the country.[13]

Transaction activity has also dominated in the major cities for example such as NCR, Mumbai, Bengaluru and Pune accounting nearly 80%-85% of the leasing in the first six months of 2013.

The retail real estate market seemed, by all accounts to be promising despite global concerns and economic uncertainty. Major cities kept on seeing consistent expansion by international apparel, food and beverage (F&B) retailers. Several well established and well known international mass market brands have likewise entered the non-metro cities, mostly because of absence of space options in metro markets. Domestic retailers are extending relentlessly in tier-I locations but intense competition with international brands for prime space in core locations is pushing a few to non-metro cities. Fashion keeps on being a high growth sector and leading apparel brands from the US and Europe keep on attempting and enter or extend in major markets across the country, including some non-metro locations. International F&B outlets are additionally expanding both fast food and fine dining segment of the market. Luxury retailer has focused on the major metro cities in India but continued to upgrade their strategy and product offering for India, which, in selected cases, has seen them consolidate and lessen the size of some stores. Amongst domestic retailers, home furnishers and supermarkets are growing in metro cities.

The supply of organized Grade A malls in the leading cities of India (the NCR, Mumbai, Bengaluru, Chennai, Pune, Kolkata, and Hyderabad) accounts to 55 million sq.fts. Apart from the investment grade malls, these major cities have also seen development from 20 to 25 million sq. ft. of hypermarket spaces. In view of the stable leasing activity and slowdown in completion of malls the vacancy levels in malls have also declined. NCR,

[13]ISI Emerging Markets – "India property market overview 2013 published by FRPT research" ; EY research

which has finished supply of around 25 million sq.ft.is currently witnessing a vacancy of almost 14%. Chennai and Pune are currently witnessing vacancy level of 12% to 20% on account of inflow of fresh and relatively slow leasing activity. Prominent cities for example Bengaluru and Mumbai have low vacancy levels of approximately 8%–9% by virtue of low steady leasing activity and non-expansion of large retail spaces in the most recent 1–1.5 years. Hyderabad has insignificant space accessible to rent in investment grade formats[14].

In case of hospitality and domestic trend, the Domestic travel expenditure contributes 81% of the direct travel and tourism Gross domestic product, with domestic tourist visits (1,036 million) registering an increment of close to 20% from 2011. International tourist arrivals, then again, were recorded at 6.6 million in 2012, an increment of 4.3% over the earlier year. Foreign Exchange Earnings likewise enhanced by 7.1% over the same period. The top-three international source markets for India kept on being the US (16%) followed by the UK (12%) and Bangladesh (7%)[15]. The country has more or less 95,000 hotel keys as now in the organized segment. This shows a growth of more or less 18% from 2008–09 to 2012–13, which is reflected as one of the strongest in the world. Majority of the rich hotels were constructed during the past five years, when the inventory started operations around the worst financial crises of 2008-2009. The demand for hotel for the purpose of tourism, conventions and business exercises has developed at a compound annual growth rate (CAGR) of more or less 18% over the last five years. During last five years, industry has viewed the growth of more or less 9% and revealed healthy demand. Still on account of large sale inventory being operational in the past four to five years, supply has overtaken demand in Key cities for example Ahmedabad, Chennai, Noida, Bengaluru, Jaipur, Gurgaon, and Pune have witnessed large scale addition of hotel keys in the last four to five years.[16] Even in case of the funding to the

[14] Property Times India retail sector Q1 2013 sourced from ISI emerging markets.

[15] World Travel & Tourism Council's (WTT's) *Economic Impact 2013 – India* report; Market Research and Statistics Division, Ministry of Tourism, Government of India,2013 statistics.

[16] HVS report- 2013- "*Hotels in India Trends Opportunities*".

real estate also after the 2012 there has been a tremendous decrease in the funding flow from various sources like FDI and private equity funds and bank credit.

KPMG in his report "*Indian real estate opening doors*"2013, describes an India's real estate sector is backed by the strong economic performance and reforms. Along with the linearization of the economy, rapid population growth, rising young population, middle class populace, urbanization and growing nuclear families contributed to the growth of the real estate sectors. Approximately 91 million population had moved to the cities resulting development of 2774 new cities. The total number of cities is 793,[17] this urbanization led to development of 51 million new houses. The share of the real estate is expected to increase from 6.3% in 2013 to 13% by 2028. In absolute term, real estate market size is expected to upsurge seven times to USD853 million in 2008 from USD 121 billion in2013[18].

Residential sector contributes 80% to real estate sector except to grow significantly over the next few decades. India currently is facing shortage of 18.7 million housing since 2012[19]. The recent global crisis has affected the real estate sector especially residential sector has turn towards the affordable housing segment. Affordable housing in India is defined as housing for economically weaker section, low income groups' households. It is expected account for 80%-85% in the total of residential sector. Affordable housing in India range from 250-650 sqf and typically cost between Rs8000 – Rs17000 per unit. Considering an average housing size of 400 sqf, India requires the 15-18million square feet[20].

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[17] Census 2011, government of India, urban scenario ministry of urban development website, http://moud.gov.in/urbanscenario , accessed 2 April 2014; KPMG in Indian analysis .

[18]Cebr's world economic league table, cebr, December 2013;KPGM in Indian analysis; country and region specific forecast and data, the world bank, accessed 31 march 2014.

[19]12th five year plan, planning commission, government of India.

[20] India needs variety of homes,DNA website,http://www.dnaindia.com/analysis/column-india-need-a-much-wider-variery –of-home-1739718-,september2012;KPMG Indian analysis.

Expansion of the information technology, ITes (information technology enabled service), banking financial services and insurance resulted enhance in the demand for office space. These three sectors have occupied significant space 75% of the 375 million square feet of total office space.

An Indian retail sector plan stock is 100 million square feet. Nearly 70% of it is occupied with seven major cities namely Delhi, Bengaluru, Chennai, Hyderabad, Mumbai, Kolkata, Pune. Majority of this space is added over the last decade. During the period 2006 to 2011, 3500 super markets, 260 hyper markets 20000 specialty stores and 28 cash and carry stores have come up in India[21].

Reform in 2005 has allowed the inflow of FDI about USD 10.5 billion, which is about 5% of total FDI inflow since 2005. In 2012 FDI inflow and private equity inflow has tremendously slow downed, resulting the rising interest rates from the large global fund. At this juncture several new investors for example Qatar investment authority, Abu Dhabi investment authority, Canada plan invest board, Standard charted bank, Clear water capital, Proprium capital partners and Hayath investment have contributed significantly to the Indian real estate market. Especially these real estate investors contributed to commercial properties.

Commercial sector consists of office, retailer and industry; these sectors' growth depends upon the service sectors such as IT, ITeS and BFSI, industrial sector such as logistics, house ware and manufacturing.
In case of the office space AITs and ITes sectors are the major occupiers of office in India of52% which comes up in 2010[22]. BFSI( ) is the second largest occupier of the office space in India occupying about 16% of the total office space [23]

[21]India needs variety of homes, DNA website,http://www.dnaindia.com/analysis/column-india-need-a-much-wider-variery –of-home-1739718-,september2012;KPMG Indian analysis.

[22]"Understanding commercial real estate consumer", knight Frank, January 2014.

[23]"Understanding commercial real estate consumer", knight Frank, January 2014.

Indian retailing is expected to increase at the CAGR of 8% from USD 518 billion in 2012 to USD 957 billion by 2020[24]. The organized retail is expected to increase USD 41 billion to USD 191 billion during the same period.[25] Indian total demand for organized retail space by 2020 could be possibly reach 275-300 million square feet[26].

Indian government has been taking significant measures to endorse the growth in manufacture sector. Among the most prominent is the 1483Km long Delhi- Mumbai industrial corridor (DMIC) which is expected to significantly boost demand for industrial real estate. The corridor is connected to seven states in northern and western India through a multi- modal high axle load dedicated freight corridor. With technical and financial support and assistance from government of Japan, DMIC would witness development of about 11 industrial regions. Similar corridor also planned to connect Amritsar to West Bengal (north to east) and Chennai to Mumbai (south to west).[27]
The difficulties faced by the real estate sector can be ordered under five categories.

1. Lack of appropriate land with scarcity of basic infrastructure in India. It results to the enhancement in the land price in urban areas.

2. The procedure of getting construction permit or license has get to be troublesome over the last several years therefore it is the most important reason in contributing to the delay in real estate development. As for the report of the panel on streamlining Approval Procedures for real estate project (SAPREP) set up by minister of housing and urban poverty alleviation, a developer has to follow at least 34 regulatory permits and takes an average of 227 days.

[24]"Issues of new banking license will spur demand for office space: jones langlasalle" Business line website ,http://www.thehindubusinessline.com/industry-and-economy/banking/issue-of-new-banking-licensing-will-spur- demand-for-office-space-jones-lang-lasalle/article5309868.ece,November2013

[25]Retail,IBEFwesitehttp://www.ibef.organ/industry/indian-retail-industry-analysis-prasentation,augest 2013; Indianreatail report 2013, image Group.in;KPMG in indian analysis

[26]Organized retail, crisilresearch,November 2013; KPMG in indian analysis

[27]Manufacturing india 's industrial Real Estate Infrastructure ,CII,2013

3. Lack of clear land title protection in India often makes it troublesome for developer to gain suitable land parcels. nonappearance of clear land titles sometimes result in long drawn and extravagant litigation for developers.

4. Absence of long term funding from banks is compelling developers to look at alternative sources of funds, large portion of which are not offered moderate rates.

5. Despite being the second biggest employer in the nation, the construction sector as a whole encounters man power shortage.

KPMG research on union budget 2015 analyses the theme of the Union Budget 2015-16 was to enhance transparency and stimulate growth in the country. The Finance Minister has sensibly allocated the limited funds available with the Centre on account of higher sharing with the states. Affordable housing, smart cities and infrastructure development have been important areas of focus of this government from the time it came into power last year. Accordingly, through this budget, the Finance Minister has provided several policy road maps, increased budgetary allocations and announced administrative measures to accelerate the growth of infrastructure, which in turn will boost the real estate sector. The Finance Minister has also restated the government's commitment towards *'Housing for All by 2022'* by targeting construction of six crore housing units. Overall, therefore, the Finance Minister has taken several steps in the right direction to boost the infrastructure growth in the country, but leaving the real estate sector *'high and dry'.*

Other vital announcements such as deferment of GARR, reducing corporate tax rate from next year, rationalizing some provisions of REITs taxation and rolling out of GST within a year are expected to accelerate the growth of the building and construction sector and the overall economy. The abolition of wealth-tax law is expected to benefit the real estate owners and developers.

The proposed bill on curtailing black money is expected to significantly improve transparency in the real estate sector. The slight increase in service tax and excise duty may impact housing prices, but study believes, it might get offset by gradual reduction in interest rates.

The budget, still, did not have any specific major announcements to boost the stagnating housing demand in the country. Further, the budget lacked direction for the development of smart cities and affordable housing projects, and has not provided/rationalized fiscal incentives to accelerate their development.

The Finance Minister has also declared phased reduction of corporate tax rate from 30 to 25 per cent over the next four years and the corresponding phased abolition of exemptions and incentives from FY2016-17. There are no indications of the impact of these announcements on the infrastructure sector, which needs to be seen as and when the specific amendments for removal of exemptionor incentive are announced in the next year's budget. Any withdrawal of exemption or incentives for the infrastructure sector can have a negative impact thereon and consequentially, on the real estate sector as well.

Sonia Sahni in her paper "Real estate – the Indian story" explains The Indian real estate sector guarantees to be a gainful destination for outside investors into the nation. The Indian realty sector, if channelized properly, could sling the development of several other sectors in India through its regressive and forward linkages. Then again, there are potential confinements for domestic as well as foreign investments in India. Unlucky deficiency of a single regulator to monitor business practices prevalent in Indian real estate market is perceived to be a risk factor by investors. The SEZ rules which are issued by the Commerce Ministry are always adjusted, creating uncertainty. Since the liberalization of FDI norms, considerable foreign ventures have flown into real estate; the availability of suitable exit options for such investments is still obliged.

Maturity of the real estate markets will prompt infusion of outside venture and selections of worldwide best practices by real estate players. Developers will get more organized, and become more crystal clear to avail opportunities emerging in the market. With the Indian securities market regulator SEBI allowing real estate mutual funds (REMFs) in India, equity investors will have a way out alternative accessible to them. every of these components will contribute in making the Indian real estate market more organized and structured, therefore giving better investment opportunities.

Narendra Kothari (2011) in his paper laid emphasis on the real estate sector and FDI (foreign direct investment) flow with special reference to housing sector. This paper clarifies that FDI flow in to the real estate and housing market enlarged 80 timesamid the 2005-2010. Statistics show that in 2005, FDIs in real estate was only Rs 171 crores. It has been increased to Rs 13,586 crores in 2009-10[28]. Housing or residential sector in an India has been absorbing more FDI flow than any other sector.

The word 'real estate' is defined as land, and any buildings or structures on it. It includes a residential housing, commercial offices, and trading spaces for example hotels, theatres, restaurants, retail outlets and industrial buildings such as factories and government buildings as subsectors[29]. Real estate comprises activities such as sale, purchase, development of the land, residential and nonresidential building and the main actors in this market are the landowners, builders, real estate agents, developers, buyers,tenants etc. investment in the real estate is either for income generation or a primary residency. The real estate business includes the brokerage, property management, developmentand real estate marketing and relocation services. Brokerage assists the buyer and seller in transaction, development is of using land for adding new building orreplacing new building, property management is to manage property of owners, real estate marketing is a sale side of the property business, reallocating service is about reallocating the people or business to different country. The following factors influence the price and cost of the real estate:

1. The physical characteristics of the property.
2. The property rights.
3. The time horizon of holding the property.
4. Geographical area.
5. The development rate.

The residential demand is a keystone of the real estate sector and main impacting variables or drivers of the residential sector are an increasing disposal income, an

[28] Annals of Management Research, Volume 1, Number 1, September – October 2011

[29]A study on Problems and Prospects of Investment in Real Estate in India, Dec-Feb 2011-2012,p.g,no,08

expanding number of the nuclear family unit. Real estate has realized its peak during the first three quarters of 2008, with residential prices reaching an all-time high, largely led by investor driven market speculation. The economic recession in the second half of the 2008, rising economic instability, job cuts and employee dismissals made a huge dent in consumer confidence and outlay. This has decreased in demand for luxury and premium residential projects across the country. This economic recession shifted the focus towards affordable houses. While the initial focus on affordable housing has been probably due to the dip in luxury, several developers forayed into this segment in 2010 to provide the needs of the middle income home buyers. As a fast selling realty product, sale of affordable projects have assisted developers to pay off bad loans. Still, the second half of 2010 has witnessed several developers, increasing their price expectations in certain fast selling residential destinations in the cities of Mumbai and Delhi. There has been growth in capital values in the range of 30-40% in certain premium locations of Mumbai, which has affected sales and slow down absorption in the last few months of 2010.

Real Estate (Regulation & Development) Bill 2013:

This bill was introduced in Rajya Sabha, initially the purpose of this bill is about protecting the interest of the consumer, promoting the real estate sector and ensuring sale of plot, apartments or buildings. This bill starts with the statement: the real estate (regulation and development) bill, 2013 a bill *"to establish the Real Estate Regulatory Authority for regulation and promotion of the real estate sector and to ensure sale of plot, apartment or building, as the case may be, in an efficient and transparent manner and to protect the interest of consumers in the real estate sector and establish the Appellate Tribunal to hear appeals from the decisions, directions or orders of the Authority and for matters connected therewith or incidental thereto.*"[30]

[30] The real estate regulation bill (regulation and development), 2013.

It has a significant impact on the real estate sector mostly on the residential, commercial, retail constructions, as follows:

1. Developers to keep 70% of buyers' funds in escrow account (separate bank account) to ensure that money is used for that project itself and is not diverted for execution of older projects or debt reduction.
2. Launch of new projects can be announced after getting all relevant clearances only.
3. Pre-sale launch without regulatory approvals is restricted.
4. Developers will have to sell property based on the carpet area.

According to Cushman and Wakefield (2014), the impact of this bill will be:

1. In the short-to-medium term, there could be slowdown in new project launches.
2. An upward pressure on prices may be created as there will also be some cost implications as developers wait to launch their projects with due approvals in place.
3. Retaining amounts realized from the allotted and placing them in banks would affect the financial cash flows for projects, particularly, in metropolitan cities.

The Report on Trend and Progress of Housing in India (2012) describes the dynamics of the housing market in India. The National Housing Bank was established by the Reserve Bank of India in 1988 in order to promote private real estate acquisition. The NHB is also responsible for regulating and refinancing social housing programs. In its yearly reports, the organization summarizes the issues regarding housing in India. The main focus is the availability of affordable housing and some of the obstacles include overpopulation of certain areas, the lack of affordable finance, infrastructure and regulatory hurdles.

According to census data, the percentage of population living in urban areas rose from 28to 31 percent between 2006 and 2011, and is estimated to have increased further in recent years (NHB, 2012).Publications by the Reserve Bank of India focus on the deployment of housing finance in India.

Mohanty (2013) discusses the future of housing finance in light of the demand-supply gap, favorable demographics and increasing urbanization. He emphasizes the need to preserve financial stability along with attempts to increase the accessibility of housing finance and presents evidence from Reinhard and Rogoff (2009) to illustrate that the six major banking crises in advanced economies since the mid-1970s were connected with a housing bust. Mohanty compares the housing market in India with that of the US, observing some crucial differences such as "the predominance of new construction and first time ownership" in India. Yet, he proposes that it is important to apply lessons learned from the sub-prime crisis in order to prevent a financial crisis due to a housing bust.

Gandhi (2012) explains the pressure on house prices in Mumbai over recent years. As the city became a center for economic and commercial activities, Mumbai experienced a rapid growth in populace leading to distortions in the housing markets in India that obstruct the accessibility of affordable housing. The paper elucidates a mismatch between household income and house prices evidenced by the fact that "at the present income distribution and institutional rates, only 5-6 percent of households can afford a house in Mumbai" (Gandhi, 2012). It also elucidates a violation of the household's stock and flow principle that is crucial for equilibration in the housing sector (Lipsey&Harbury, 2004). When measured against the distance from a city's central business district, most cities in the world have a downward sloping Floor Space Index (FSI) (Bertraud, 2010). However, property prices in Mumbai violate the principle that there is a flat FSI line against distance from the city center. In these big cities, house developers provide to a small proportion of the population – the rich elite – by focusing on the construction of luxury housing (Gandhi, 2012). Although Gandhi emphases on Mumbai in his paper, he advises that most Indian cities face "issues of infrastructure, slum proliferation and inefficient urban land management" in the housing sector. Several pieces of economic literature describe the relationship between residential real-estate and the macro economy.

The real estate includes four sectors namely housing, retail, hospitality and commercial. Although housing contributes to 5%-6% of the country's gross domestic production, the reaming three from the sub-sectors are also growing at fast pace, meeting the increasing infrastructural needs. The real estate sector has transformed from being unorganized to a dynamic and organized sector over the past decade. Government policies have been instrumental in providing support after recognizing the need for infrastructure development in order to ensure better standard of living for its citizens. In addition to this, adequate infrastructure forms a precondition for sustaining the long-term growth momentum of the economy. The growth of this sector is well complemented by the growth of the corporate environment and the demand for office space as well as urban and semi-urban accommodations. The construction industry ranks third among the 14 major sectors in terms of direct, indirect and induced effects in all sectors of the economy.

It is also expected that this sector will incur more non-resident Indian (NRI) investments in the near future, as a survey by an industry body has shown a 35 percent surge in the number of enquiries with property dealers. Bengaluru is estimated to be the most favoured property investment destination for NRIs, followed by Ahmedabad, Pune, Chennai, Goa, Delhi and Dehradun. Private equity (PE) funding has picked up in the last one year due to attractive valuations. Moreover, with the Government of India introducing newer policies helpful to real estate, this sector has garnered sufficient growth in recent times.

CRISIL research in 2012 shows and divide the real estate residential growth into four phases 2001-2005, 2006- 2008,2009-2010, 2011-2014.

The first phase is an economic recovery phase and initial growth period, in this period indian real estate sector followed by the global recovery and there was a stabilized growth in economic activity and urbanization.

The second phase, there were low interest rates and growing urbanization increased the demand of the real estate sector and it was a high growth period and these factors accelerated the growth of the real estate sector and doubled the growth rate of the housing sector.

Third phase was a period of global down turn, it witnessed over supply since it led to falling prices this was because of the drawback of the various real estate investors accompanied by slowdown in the capital market.

Fourth phase is expected as a consolidation period after slow down, and demand is expected to remain strong with humble rise in the capital value. This period is anticipated to witness substantial supply of housing especially in urban areas.

CRISIL anticipated that the national housing shortage would minimize because of the government thrust on the decent housing programmes to improve and provide rural housing under the various development schemes. And also provision of houses to the homeless in urban and the slums' redevelopment programmes in urban under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM).

Despite the intensive growth witnessed in the past 10 years, substantial house shortage dominates in India. According to the report submitted by a technical committee to the Ministry of Housing and Urban Poverty Alleviation (MHUPA), India's urban housing shortage is figured at nearly 18.78 million households in 2012. The report also highlights that nearly one million households are living in non-serviceable 'katcha' houses, at the same time over half a million households are in homeless conditions. Of the total urban housing shortage, nearly 62 % houses are self-owned, while 38 % families live in rented homes. Urban housing shortage is prominent across the economically weaker sections (EWS) and low income groups (LIG) which together contribute over 95% of the total shortage. The shortage among middle income groups (MIG) and above is estimated at less than 5 %.

SukrithBasu, 2014, in his paper concentrated on the Indian residential real estate sector with special reference to the Pune and it gives broadly an over view of an Indian and global real estate trend which determine the quality of life and housing shortage. Generally this sector influenced by the many socio, eco political factors like income distribution, union budget, inflation, political uncertainty. At the global level also economic growth is very low, it started recovering in the end of 2014. In the year 2014 global market started with confidence and is influenced by the local and global factors.

1.5.1 Hyderabad real estate market

Out of the top cities in India, Hyderabad is undeniably best affordable residential market; the city has been renowned as the second silicon valley of India after Bengaluru and has emerged as an IT/ITeS and biotech destination.[31] It the administrative, financial and economic capital of the state additionally, the major contributor to the state's GDP. Infrastructure developments such as ORR (outer ring road) an eight lane expressway is being built in the city and work is in progress on the last stretch between Shamirpet and Pedda Amberpet. This ORR links Shamshabad airport, and benefited the city by circular connectivity and reduced burden of the inner road connectivity and also reduced time and distance of reaching out the destination.

And another major project, the Metro railway project is under construction, Phase I of the project will connect Miyapur and LB.Nagar, Nagole and Shilparamanam, JBS and Falaknuma. Unlike the Outer ring road, the Metro cuts through the city joining north with south and east with west in a linear manner, these are encouraging growth of residential market of above mentioned areas.[32] The proposed Hyderabad Metro Rail Information Technology Investment Region (ITIR) is also expected to boost the real estate expansion in the city. Addition to these developments industrial park, free economic zone and ware housing zone, export units are also inducing growth residential sector.

[31]Knight Frank report 2014, Hyderabad residential traction@glance,p.4

[32]Knight Frank report 2014, Hyderabad residential traction@glance,p.4

Despite having sound infrastructure and other developments, Hyderabad city could not attain the expected level of growth due to political uncertainty. The investors could not dare to invest in such uncertain circumstances and it pushed back expected level of growth and expansion of all sectors of the real estate market. The political uncertainty over Telangana has broken on June 2, 2014.

Hyderabad being the productive city for the real estate and other sectors; emerged as an underdeveloped Tier- III city into energetic city with prosperous business opportunity and is the most important center of employment, able to occupy place in top ten cities in country. Hyderabad real estate and other sectors are not an exception from global crisis; since it has been badly affected by the global crisis 2008 as like the other cities. The global financial crisis associated with political uncertainty due to strong agitation over Telangana has also affected the new launches and capital value of the real estate market and restrained the development of the real estate sectors' number of new launches has reduced and stagnated capital value. The new locations emerged at the peripheral of city namely Alwal, Telapur, Shamir pet and Nallagandla as new residential corridors. The capital value of real estate market had shown it peak level in 2008 only, after the political and global turmoil it could not reach its peak till now. But given the existence of strong real estate drivers like infrastructure and commercial activity in the city, the existing capital value provide the impression beneficial largely on account of undervaluation and affordability compared to other cities.

Hyderabad real estate market has expanded rapidly, where it was concentrated in few areas in pre 1990. The real estate market expanded from center of the city to peripherals, having reached its high level in 2008. During pre-1990 the real estate activity largely concentrated in old city and other areas namely Abids, Musheerabad, Srinar colony, Begumpet, Marredpally etc.[33]

[33] Rethinking Bulbs, Hyderabad back in Rocking?,ISSUE, September 2012.

During the period 1990-1999 development of new CBD (central business districts) areas nearer to erstwhile airport Areas such as Punjagutta, Banjara Hills, Soumajiguda, Jubilee Hills, etc. areas got reputation and expanded quickly[34]. The Residential activity gained impetus in South East locations namely Dilsukhnagar, L B Nagar,etc.

In 2000-2008 the City was developed as one of the prominent IT/ITeS hub of the country, areas surrounding the Hi Tech city were developed as a new growth corridor. The Peripheral areas (outskirt) such as Madhapur, Miyapur, Gachibowli, Kukatpally, Tellapur and Kondapur gained importance from the IT/ITeS development in city. The capital values of real estate market augmented and residential market expanded faster than the other sub sectors of real estate market. This period has experienced huge supply and shocking price appreciation due to healthy market and absorption level and also it was backed by development of the human capital presence firm IT/ITes. These industries accelerated the growth of residential sector especially and weighted average of residential real estate sector accelerated from approximately INR 1,000 per sq. ft. in the year 2000 to INR 3,100 per sq. ft. by Q3 2008 showing an annual increase of about 15%.[35]

The time period 2008-2009 was characterized by negative global economic scenario. The Real Estate market stumbled with decline in new launches as well as absorption.All the major micro markets experienced a drop in capital values. Until first half of the year 2008, the real estate activity in Hyderabad was marked at its peak. Real Estate in the city was characterized by numerous new launches backed by positive market sentiments and optimistic developers. The city's real estate capital values increased at a scorching pace till 2006-07 after which it fell sharply.

Hyderabad real market boom was badly hit by market distrust originating from the global financial crisis. The period between H22008 and H12010 has seen fall in launches as well as absorption and colossal build-up of inventory peaking to an average

[34] Rethinking Bulbs, Hyderabad back in Rocking?,ISSUE, September 2012

[35] Rethinking Bulbs, Hyderabad back in Rocking?,ISSUE, September 2012.

of 28 months for the whole year in 2009. In post 2009, the inventory overhang has obstinately floated in the red zone. Even in the case of absorption more than demand as in the case of H1 2010, inventory overhang had not fallen down below 22 months. Slow recovery has been experienced by the all major market in Post H1 2010. Hyderabad real estate market was affected by uncertainty creating the political chaos over Telangana issue. Developers and buyers have been hesitating and running away from the market due to fear of price crash in the event of violent agitations. All this has led the market in to stagnation in real estate activity and capital values in the city. Even after one year of resolved political uncertainty on Hyderabad, real estate sector could not register the full recovery; it is in sluggish, since there is high inventory level and low demand.

Chapter-2

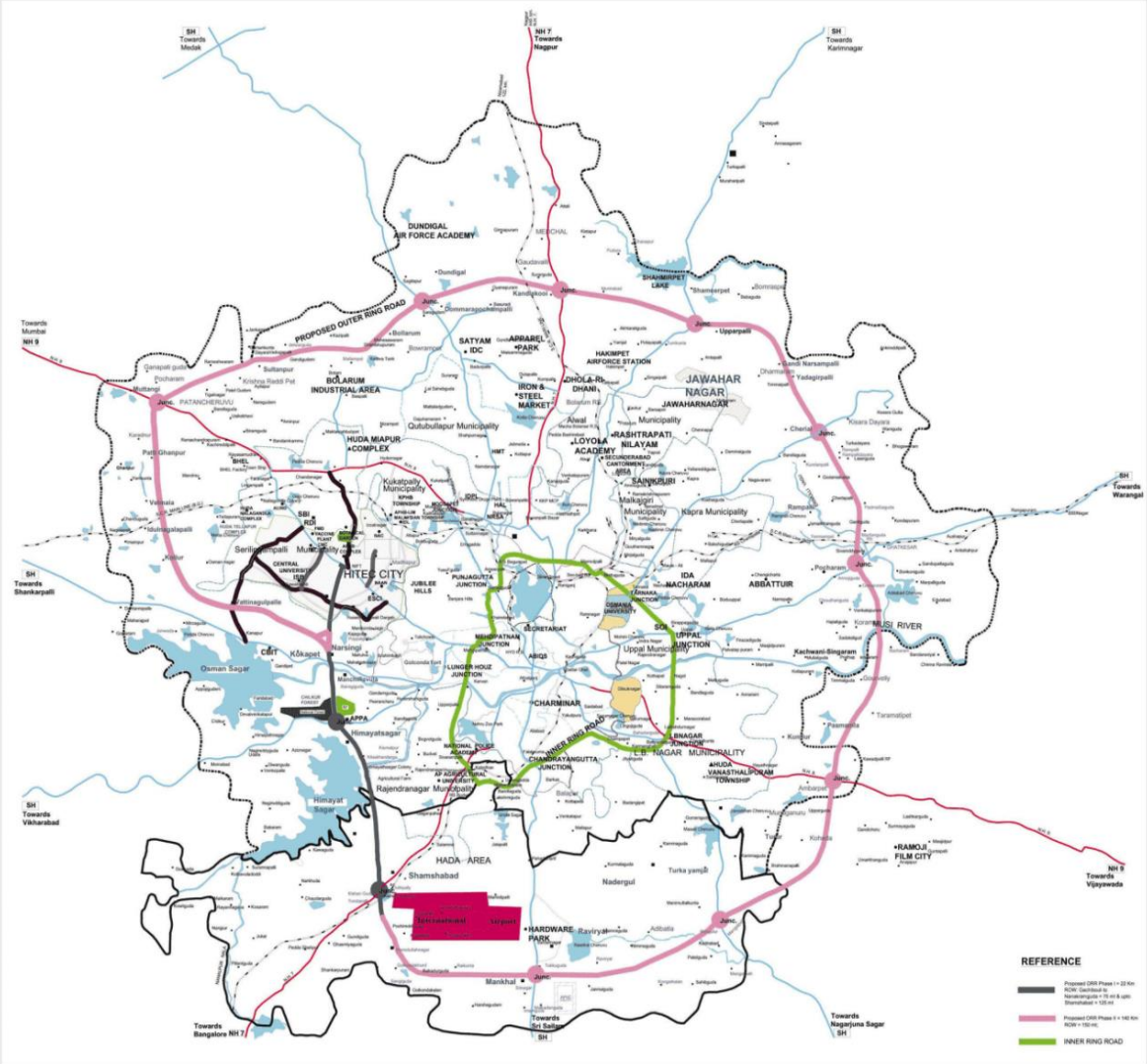
Objectives and Methodology

2.1 Introduction

Hyderabad is the common capital of Telangana and Andhra Pradesh and is one of the top cities in India, occupying 650 square kilometers and is situated on the back of The Musi River and northern part of the Deccan plateau. According to 2011 census it has population of 6,809,970, it has metropolitan area 7.75 million, making it the fourth most populous city and sixth most populace accumulation. At an average height of 542 metres (1,778 ft), much of Hyderabad is located on mountainous topography around artificial lakes, including the Hussain Sagar predating the city's founding itself on the north of the city center.

Muhammad Quli Qutb Shah had built the Hyderabad in 1591. It was kept under the rule of the Qutb Shahi dynasty until 1687, it was gone under the control of Aurangzeb when he oppressed the area and the city turned into a part of the Deccan territory of the Mughal Empire. In 1724 Asif Jah I, a Mughal viceroy, announced his sovereignty and set up the Asif Jahi administration, otherwise called the Nizams of Hyderabad, ruled the regal condition of Hyderabad for more than two hundred years, in a backup coalition with the British Raj. The city continued the princely state's capital from 1769 to 1948; Nizam dynasty was merged in Indian Union, when the Nizam signed an Instrument of Accession with the Indian Union at the conclusion of Operation Polo. Hyderabad was a capital of Telangana state between 1948 and 1956. The state reorganization act 1956 merged the Telangana and Andhra Pradesh and made the modern state of Andhra Pradesh, with Hyderabad as its capital. After a Long struggle and Agitation by Telangana people for separate state, a separate statehood was achieved on 2nd June of 2014 and Hyderabad was made the capital city for two states; permanent capital for Telangana and a temporary (for 10 Years) capital for the residual state of Andhra Pradesh.

Figaure2.1: Map of Hyderabad



Source: Hyderabad Metropolitan Development Authority.

2.2 Administrative Framework of Hyderabad

The Hyderabad Metropolitan Development Authority (HMDA) was framed by an Act of the Andhra Pradesh Legislature in the year 2008, with a territory of 7,100 sq km under its domain. It is the second biggest urban advancement zone in India, after the Bangalore Metropolitan Region Development Authority (8,005 sq km). HMDA was framed by the converging of the accompanying recent substances: Hyderabad Urban Development Authority (HUDA), Hyderabad Airport Development Authority (HADA), Cyberabad Development Authority (CDA) and Buddha Poornima Project Authority (BPPA). HMDA was established for the reasons of planning, organizing, administering,

advancing and securing the scheduled development of the Hyderabad Metropolitan Region. It organizes the improvement exercises of the metropolitan companies, regions and other neighborhood powers like Hyderabad Metropolitan Water Supply & Sewerage Board, Telangana Transmission Corporation, Telangana Industrial Infrastructure Corporation, Telangana State Road Transport Corporation, and other such departments and organization. The HMDA likewise keeps up and deals with the Hyderabad Management Development Fund, allotting funds in light of the plans and projects of local bodies to undertake development of services and infrastructure facilities. HMDA has 4 zonal headquarters, situated in Medchal, Shankerpally, Ghatkesar and Shamshabad and Hyderabad can be partitioned into four zones.

Table2.1: Hyderabad metropolitan (HMR) regions / zones

Sl no	Zone	Areas comprises
1	HMR-Central	Begumpet, Banjara Hills, Jubilee Hills, Panjagutta, Somajiguda, , Chikkadpally.
2	HMR-West	Kukatpally, Madhapur, Kondapur, Gachibowli, Raidurgam, Miyapur, Kukatpally, HiTech city, Manikonda and Gopanpally.
3	HMR-East	Uppal, Malkajgiri, L.B. Nagar, Mallupur, Cherlapally, Kuntloor, Uppal, Kapra, Ghatkesar, Pocharam, Rampally, Nacharam.
4	HMR-North	Kompally, Medchal, Alwal, Qutubullapur Yarpal, Nagpur High way, Shamirpet.
5	HMR-South	Rajendra Nagar, Shamshabad Malakpet, Saidabad, Upparpally, Santhos Nagar

Source: Knight Frank report (2014), Indian real estate outlook residential and office.

This study focuses on the Attapur region, along with the different locations of Hyderabad. In present study the atthapur adda was taken as a case to examine the market dynamics and relationship between the different actors in the market or adda.

Attapur is a noteworthy suburb in Hyderabad, Telangana. It gives connectivity to the Shamshabad International Airport. Being near to Mehdipatnam, it is an included favorable position for Attapur. The Mehdipatnam-Aram Garh Expressway goes through Attapur. The Attapur RTA is one of the greatest in Hyderabad and is no doubt understood as it covers a considerable measure of territories under its purview.

2.3 Reason behind selection of this project

Hyderabad is one of the top metropolitan cities and it is developed from 3rd tier underdeveloped city to well-known; one of top ten cities in the country. The growth of urbanization and real estate sector expansion are boosting growth of several sectors through direct and indirect links. Expansion of urbanization, increase in population and growth in real estate sectors have been closely related to the brick industry since it is a main input for the residential, commercial and public sectors constructions. And shelter is considered as basic need after food and clothing.

Hyderabad is reputed and well know city for real estate boom and city has plenty of opportunities for the real estate development. The infrastructures facilities, IT/ITeS developments SEZs and large chunks of land availability are accelerating the growth and expansion of real estate sector. This expansion of real estate sectors has been expanding the other sectors which are supplying inputs to real estate growth; among them traditional mud and clay brick and other modern brick industries are substantially contributing to the growth and expansion of real estate sector and urbanization. At the same time real estate boom is not long lasting and is uncertain too, since it has been witnessing several crises. This uncertain real estate sector and uneven urbanization results to uncertainty in its related sectors. The globalization and global financial crisis led to segmentations in construction sectors in general and more specifically in the brick kiln industry with reference to the production system, product market, nature of contract.

It can be observed that there is expansion of mud and clay brick and modern brick industries, especially mud and clay brick kilns are expanding at the outskirts of the city with the support of low skilled, deprived and migrant laborers based production system. At this juncture, more focus and research need to be carried out to understand the

changing dynamics of traditional brick kilns product (these are well known for violation of labor laws and other fundamental rights at work place), its relationship with different actors in the market in the context of changing dynamic of brick kiln product, segmentation in construction agencies, risk between markets in term of reputation and quality examination. Different kinds of segmentation with reference to brick market, capital size held with producers and consumers, consumer expectations of quality of brick. The rapid penetration of the alternative brick industries which resulted transformation of mud brick to husk, thermal wastage used light weight clay bricks in order to meet the quality requirements and excluding the traditional bricks from high valued constructions, at this juncture it is necessary to concentrate on the future of the traditional mud and clay brick industries.

2.4 Research questions

Mud and clay brick has been used as the main input for construction sectors since ages, the expansion of urbanization and real estate sectors are expanding brick production, it has been increased from 140 billion in 2007 to 200 billion in 2015 despite the input shortages such as labour, coal, clay. In addition to this, there is sheer penetration of other bricks industries into the, with mechanized or semi mechanized production system, an alternative to traditional brick. In this context the question arises regarding the future of traditional brick kilns. Firstly, do the other alternative brick kiln industries make the traditional brick kilns vulnerable in terms of demand, quality, risk or increase demand and quality of bricks and reduce risk to cope up with them? Since production of bricks have the backward end supply chain of the Real estate sector, which probably uncertain and led to segmentation in construction sectors, in this context another question arises; are the traditional brick kilns able to enter every segment of the construction sectors such as high, medium and low value construction projects or are confined to a particular construction only?

2.5 Objectives of study

1. Understanding the changing dynamics of brick kiln product market with reference to scale, technology, raw materials as well as market agents, different types of risks and quality of product.

2. Examine the segmentation in the construction sectors in general and more specifically in brick kiln industry with reference to production system, product market, nature of contract, quality of product as well as capital size; held by producers and consumers, both quality of product and price as a derivative of all these dynamics.

3. Examine the future of traditional brick kiln industries in the context of different segmentations, brought forth by real estate sector with reference to rapid growth and expansion of alternative bricks to traditional mud and clay bricks.

2.6 Methodology

This study is analytical and descriptive in form and mainly focuses on changing dynamics of brick kiln product market and different segmentation of construction sectors in general, brick kiln industry in particular. This study has depended on the primary sources and secondary sources; emphasis was given more to the primary study. The primary data collection has been done by using both; a structured questionnaire for each of the respondent category and the interview method. The total sample size is 30. The various samples or respondents related to the study were interviewed. For the purpose of Fthe data collection, the study used was the structured questionnaire. The total sample size can be divided broadly into three categories; first set of sample size is nine (9), taken from Attapur adda randomly. The second set of sample was taken from different parts of Hyderabad by a random snow ball method; total eleven sample (11), relating to construction agencies which are using traditional mud and clay bricks. Another last set of sample size is ten (10), related to construction agencies which are using other alternative bricks to traditional mud and clay bricks.

2.7 Sample design

Table 2.2: Sample design of Attapur Adda

Type of samples	Number of sample
Suppliers	6
Dealers	3
Total	9

To find out the market dynamics of brick kiln product, and to identify the different actors within and their relation, risk, scale of operation and quality determination of product; Attapur Adda was taken as case study. Here for this study a total size of nine (9) samples were taken; out of them six (6) are suppliers and three are (3) dealers.

Table 2.3: sample designed of clay brick using construction agencies

Types of sample	Number of sample
Residential construction	9
Public utility constructions	2
Total	11

For the study, a sample size of eleven (11) construction agencies were taken, which have been using mud and clay brick. Out of them nine (9) are residential construction project and two are public utility construction projects.

Table 2.4: sample design of other brick using construction agencies

Table sample design	Table sample design
Residential	8
Commercial	2
Total	10

For the study, a sample size of ten (10) construction agencies were taken, which have been using other alternative brick to traditional mud and clay bricks. Out of them eight

(8) are residential construction projects and two (2) are commercial construction projects.

2.8 Data Source

Both primary and secondary data have been used for the study, important respondents of the study are suppliers, dealers in Adda, supervisors, owners of the construction projects and individual house construction owners. The questions of the survey include open-ended as well as closed-end questions and a structured questionnaire schedule, designed for each of the respondents. The various reports, journals and news also have been taken into consideration, such as brick kiln reports of Eco Brick, clear air task force, UNDP-GEF Project, Cush man & Wake Field, Knight Frank, Andhra Pradesh real estate association, KMPG and CRISEL.

2.9 Structure of the Dissertation

This study contains five chapters; the first chapter presents introduction and review of literature and it gives the brief introduction of brick kiln industry in global, Indian, Hyderabad context and also give information regarding different types of development programs introduced in India. The review of literature provides theoretical frame work and approaches of the present study.

The second chapter explains the methods of data collection which are used in present study and also back ground of study locations, reason behind selection of present study, research questions, and objectives of study and research tools used in the present study.

Third chapter looks at the issues related to the market dynamics of the bricks market and different actors in this market, price and quality determination, relations between and how risk is borne by different actors.

Fourth chapter explains the relationship of the segmentation that exists in the construction sector in general and the brick kiln industry in particular, with reference to the production systems, product market, nature of contracts, intermediary agents as well as modes of marketing amongst the consumers with the segmentation that exists in the resources or size of the capital held by various producers and consumers, variety of costs

and risks pertaining to different types of markets, segmentation in the quality of the products and standards expected by consumers and finally the segmentation in the prices as a derivative of all these dynamics. The fifth chapter summarizes the present study.

Chapter-3

Market dynamics of the clay brick kilns; the case of Attapur Adda

This chapter looks at the issues related to the market dynamics of the bricks market and different actors in this market, price and quality determination, relations between and how risk is borne by different actors. This is based on a case study of Attapur Adda, which is a famous clay brick Adda[36], situated in Rangareddy district close to the outskirts of the Hyderabad city and nearby villages. The clay brick industry is one of the oldest in India and provides materials for construction sectors. Brick, being one of the oldest building materials, is extensively used as a main input in construction because of its durability, strength, reliability, low cost and easy availability. Brick industry, which is essentially labour intensive industry, renders employment opportunity to a huge work force of around several millions of people in India.[37]Brick industry is an important sector in India. India is the second largest producer in the world after China.

As per the 2009 estimates the brick production has been increasing annually between 5-10 percent. It is due to the rapid expansion of the urbanization, housing sector and decent housing programmes. India is estimated to have more than 145000 registered and unregistered brick kilns, producing as many as 236 billion bricks for a year.[38]The main inputs required for the brick kiln industry are clay, coal, land, water, electricity and labour. Brick kilns are the largest consumer of coal after thermal sector, consuming around 25 million tons every year. These kilns are functioned as small scale unorganized sector.

Although it is small unorganized sector, it has a turnover of more than Rs140 billion and present employment capacity of this sector is more than 6 million. The construction

[36]Adda means generally a place, where people gather for conversation and a junction point for public transport.

[37]Report of the Second State Conference of Tamil Nadu Bricks and Tiles Manufacturers Association held at Tirunelveli on 24th June 2004.

[38]http://pscst.gov.in/pscstHTML/brick.html.

industry contributes to about 10 percent of India's GDP, registering an annual growth of about 8-9 percent. Clay fired bricks form the backbone of the construction industry valued at close to US$ 70.8 billion (Rs.4526.952 billion). The brick sector in India, even though unorganized, is huge in size and spread. It is continuously expanding due to a rapid increase in demand in the infrastructure and housing sectors. In order to meet this demand, over 100,000 brick units have come up in the country, providing direct employment to around 10 million workers. [39]

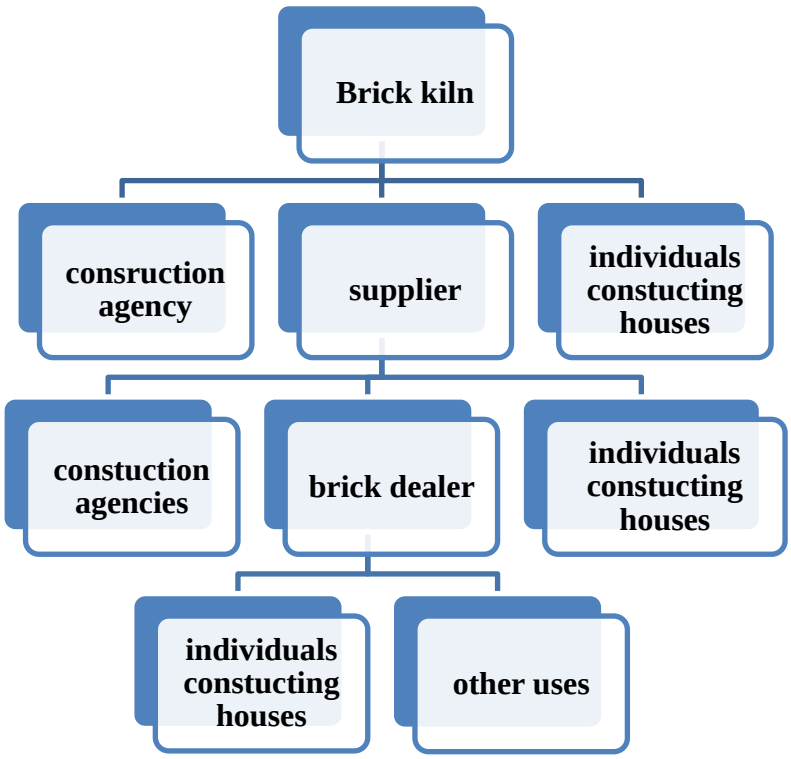
3.1 In depth case study of Attapur Adda

Adda means generally a place, where people gather for conversation and a junction point for public transport use.[40]Here Adda can be defined as the place where the suppliers of the bricks come together and sell their stock or brick to different consumers, be it for the individuals constructing houses, construction agencies or dealer.

[39]Maithel, Sameer, 2003. Energy Utilization in Brick Kilns. PhD Thesis. Energy Systems Engineering, Indian

[40] Oxford dictionary incorporated in 2004.

Map 3.1: market dynamics of the brick kilns



Source: primary survey

The brick kiln has different consumers, like the supplier, construction agencies and individuals constructing houses, therefore the consumers need not depend on kiln directly. Instead, they can access through various ways as shown in the above map. They can even outsource from the Adda, which comprises the brick sellers like suppliers and nearby dealers, who depend on the Adda. A dealer is an individual, who has permanent shop to sale the raw materials such as clay bricks, hollow bricks, cement bricks, sand and concrete stones, required for the construction sectors. For those who are not accessible to the suppliers and Addas, depend on the kiln for outsourcing.

3.2 The suppliers

The suppliers in Addas directly purchase from the brick kilns and in turn sell at the price higher than the actual price which they pay. The transaction between the suppliers and

the brick kiln or Adda respectively is not uniform, instead it varies from one brick kiln to the other or Addas. Here both the relationship between the owner of kiln and supplier, and the quality of the product mainly determine the price. However, the suppliers often do not make spot payments to the owner of kiln, which will certainly lead to delay in payment. This period of delay also differs between the owner of kiln and suppliers. In such cases, it is always the old supplier who has the long term relationship with an owner of kiln than the new supplier is benefitted.

The clay bricks can be divided into two types- lightweight bricks and heavy bricks. The price of the light weight brick is a little higher than the heavy Bricks. The prices depicted in the table below are the prices paid to the owners of kilns.

Table 3.1: Price paid to the bricks by different suppliers

Sl.no	Name of the supplier	Price of the light weight bricks in rupees	Price of the heavy brick in rupees
1	Rajendher naik	4.20	4.00
2	Venkateshwarlu	4.20	4.10
3	Raj kumar	4.30	4.00
4	Madhukar	4.40	4.20
5	Kalyan	4.40	4.20
6	Venkatesh	4.30	4.00

Source: primary survey

The amount required for a load also changes between the heavy and light weight bricks. The average amount required for a load of a light weight and heavy Bricks are Rs 68800 and 65333.33 respectively. One load contains 16000 bricks.

Table 3.2: Investment required for the suppliers to buy brick from kiln

Sl.no	Name of the suppliers	Amount required for a light weight brick load in rupees	Amount required for a heavy brick load in rupees
1	Rajendhernaik	67200	64000
2	Venkateshwarlu	67200	65600
3	Raj kumar	68800	64000
4	Madhukar	70400	67200
5	Kalyan	70400	67200
6	Venkatesh	68800	64000

Source: primary survey

These suppliers who are supplying bricks to the dealers, individuals constructing houses and construction agencies require transport vehicle, to transport the bricks from kilns to the Addas and to agencies. The major challenge the supplier has to encounter at the market place is lack of shelter, although there is an Adda they cannot reside in the Adda for more than two days since it is usually an open place, despite this, they being non-natives of the places they feel insecure.

3.2.1 Investment

Table 3.3: Average price and amount of rupees required for bricks by suppliers

S no	Types of clay bricks	An average invest required in rupees	An average price for a brick
1	Light weight bricks	68800	4.30
2	Heavy Bricks	65333.33	4.08

Source: primary survey

The suppliers need to invest on the bricks, transport vehicle and the labourer. Most of the suppliers invest from their own pockets and in few cases approach informal sources since they do not have access to formal sources of credit like banks and other formal

agencies. The suppliers need to invest an average of Rs.68800 for a light weight brick load and Rs.65333.33 for a heavy brick load. Most of the suppliers who come to the Adda, in case of the Attapur Adda, are the villagers from its surroundings and prefer to employ their relatives and communities members as labour and as a result they have an advantage of appropriating the labour power in terms of work and also delay in payment. Every supplier needs at least two labourers to either load or unload the bricks and also engage themselves in work along with the labourer. If there is delay in selling bricks, it subsequently leads to more cost of labour not in terms of wages, but on other charges like food expenses and shelter etc. for the labourers, and it should be borne by the supplier. In order to escape and get rid of these charges and insecurity at adda the supplier always anticipate and try to sell out his load as quickly as possible. The Supplier does not have the fear of payment delay and reduction in payment because he always charges the spot price (price which is pay at the time of purchase immediately) to consumer. But when bricks are not sold out, the supplier has to contact dealer, in this case both the dealer and supplier bargain and decide the price. In such transactions spot payment is mostly preferred even though it is low and the supplier rarely accepts delay in payment. If there was any delay in payment the supplier generally prefers to contact the dealer who he thinks is trustworthy.

3.3 The Dealers

Another important actor of the chain is the dealer, whose role it is, to sell bricks and other construction materials (concrete stone, sand, cement brick etc) but not in large quantity. Since the dealers are natives and have a permanent place to sell bricks and other construction materials, delay in payment is acceptable and the price differs between the consumers who pay on-the-spot and those who delay in payment, which is charged higher than spot payment. The Dealer himself or his representative has to go to the Addas in case of requirement. The dealer's shop is located near Addas and these dealers do not have any long term relationship or any form of contract with the supplier, he purchases bricks directly from those suppliers, who offer to sell at low price, with better quality and supplier is not responsible for the damage after delivering the product, dealer has to bear the risks of damage and less quality if observed. In this process, if the

dealer finds low quality and damage after the delivery of the product, generally he shall either refuse the product from the supplier for next time or dealers resort to voice function so that the supplier can be made to achieve better quality.

The prices depicted in the table are the prices charged by the dealer to the customer, who pays when he buys the product (on-the.-spot payment).

Table 3.4: Price charged by the dealers for spot payment

Sl.no	Name of the dealer	Price of the light weight bricks	Price of the Heavy Bricks
1	Dharmapal Reddy	4.60	4.40
2	Srinivas	4.60	4.40
3	V.Padmarao	4.60	4.40

Source: primary survey

In the Adda dealers are known to each other and there is homogenous price in the market in case of the spot payment, whereas there can be price discrimination and price variations can exist in the price charged for different customers with reference to those costumers, who defer payments. The price in such cases also depends upon the relationship between the costumer and the dealer, if the costumer is a familiar regular customer known for a long period of time, the price charged is generally less than the price charged for a new costumer. Apart from familiarity, repeated transactions and trust, the quantity of bricks a customer purchases also determines the per unit price in case of deferred payments, the lesser the quantity purchased, the higher the per unit price charged.

3.3.1 Investment

The dealer needs to invest on many other goods apart from clay and mud bricks, he has to purchase the cement bricks, sand, concrete and other construction sector related materials. The amount which is shown in the table below is the amount required for a dealer to purchase a load of clay bricks. The dealer needs at least two loads of bricks, one each of heavy and light weight for a week an average, if the market conditions are

normal or stable. The amount which is shown in the figure below may change every week since depends upon the conditions, if there is scarcity of the brick, dealer has to pay higher amount than it is depicted in the below table.

Table 3.5: An average amount of rupees required for dealers

S.no	Name of the dealer	Amount required for a load of light Weight bricks	Amount required for a load of Heavy Bricks
1	Dharmapalreddy	72500	70000
2	Srinivas	71000	69000
3	V.Padmarao	72000	70000

Source: primary survey

In Adda, dealers have an advantage of buying at low price from suppliers than others because he purchases bricks in bulk. In case of dealers they get more profits when there is delay in payment only, since the costumer who purchases bricks and does not pay at spot, generally charge more price than the costumer who pays spot payment and the investment which is required for business is spent from their own pockets or informal sources since they do not have any accessibility to the formal credit like bank loans.

3.4 The final consumers

The construction agencies, independent constructions work are the final consumers in the Adda, but construction agencies rarely approach the Adda. They have direct connections with the kilns. The costumer who requires very small amount and unable to pay spot payment depends upon the dealers. Unlike the dealers, the suppliers in Adda are not willing to sell very small quantity i.e., less than 100 bricks to costumers and instead prefer bulk sales. They always try to sell as soon as possible because they are not residents of the city and they do not have any security to the consignment left over in the day.

3.5 Quality of the product

The quality of the product is not taken into much consideration especially in case of suppliers, who use crude methods to examine the quality of the product, like random checking, dropping the product from height, they take colour also into consideration, believing that the more red in colour the brick is, more is the quality of the brick.

In case of the dealer, although same methods are used for quality verification, as in the case of the suppliers, however, most of the Consumers who go to the dealer trust the dealer as he is permanently stationed in a place and develops long term relations and reputation. In case of the dealer, unlike in the case of an unfamiliar supplier, customers also have a choice to return the bricks in case of less quality and/or damage, in practice therefore it is in rare instances that the consumer will examine quality of the product before purchasing. The dealers who generally own their own transport to deliver the consignment, charge the transport costs separately. In case of the construction agencies some are using quality machine and some are using crude method of quality check.

3.6 Risk in Adda

Risk is the common phenomenon in every market, this study tries to explain the risk in terms of the product rejection, quality determination, low price etc.

Table 3.6: Risk between the actors in market

Sl no	Name of the actors	Risk
1	Suppliers	↓
2	Dealers	↑
3	Costumer	↓

Source: primary survey

The above table 3.6 clearly shows that supplier has a low risk than others, he has an advantage of spot payment, hence choosing the good quality product is the task of the buyer, and once the product is delivered to the costumer the task of the supplier is over. Here the supplier is not responsible for lower quality, the whole risk will be borne by the

buyer. The buyer in turn can verify the quality of the bricks before purchasing or the buyer may also have the freedom to refuse the same supplier the next time. As explained above dealer is a person, who has permanent shop and sells various materials required for the construction sectors like clay bricks and mud, hollow bricks, cement bricks, sand and concrete stones hence, he needs to choose the product very carefully because by selling less quality bricks he has a risk of losing his costumers for other goods also and subsequently dealers take back sold-out brick, if consumer is not satisfied with the quality of bricks.

Final consumers mentioned in the above table are neither the construction agencies nor the consumer who purchase bricks from suppliers; here final consumer is buyer, who goes to the dealer for small quantity of bricks. These consumers have an advantage of returning the purchased bricks, if they find that they are of lesser quality. The consumer has very low risk in refusing the consignment; there is however a timeline within which rejections are accepted back by the dealer. The dealer will not take back the consignment of bricks that were sold to a customer, if the consignment is returned after 15 days. The buyers on the other hand, who directly purchase bricks from the supplier bear the risk of purchasing poor quality or damaged bricks without having the possibility of rejecting or returning the products . So in comparison to a dealer or a brick kiln owner, the supplier has low or even no risk once he successfully sells his bricks.

3.6.1 Inventory risk versus reputation risk – Brick Kiln Owner v/s Supplier v/s Dealer

In term of inventory risk, suppliers in the Adda have high risk compared to the owners of kiln and dealers, since the suppliers in the adda do not have any permanent place to store the unsold bricks (inventory), it forces him to sale out the product as quickly as possible. Whereas the owners of kilns and dealers in market have permanent place or shelter to store inventory, they can store inventory at the time of low prices and sell the bricks at high prices.

The owners of the kiln and dealers have high risk in case of the reputation risk. Whereas the suppliers in the adda have low reputation risk because they sale out their

consignments to different customers in various quantum, therefore they do not have any relationship with the costumers. But in case of the owners of the kiln and the dealers in the adda they maintain long term relationship with their costumers, they need to ensure and provide the good quality to their customers to maintain long term relations. In case of the dealers in adda, they have more reputation risk since he has to deal with the different kind of construction material as mentioned above; the loss of reputation of one product affects demand for other goods too. In case of the owners of kiln also the reputation risk is high since the expansion of number of brick kilns and at same time rapid growth in the alternative brick industries other than mud and clay brick industries are forcing owners of kiln to maintain reputation in order to keep the old customers and to attract new customers. But in case of suppliers, they do not fear of reputation, damage or risk since they have no long term relation with the customers.

3.6.2 Risk of business cycles – brick kiln owner v/s supplier v/s dealer

The aggressive market conditions or upward sloping business cycles the construction agencies look for multiple avenues of supply to meet their requirements of bricks. It is only under such conditions that they risk buying the bricks from suppliers. This happens because the construction companies have deadlines to meet and brick kilns cannot suddenly expand on their scales of production. Thus during the expansionary phase, the suppliers are likely to do well despite not having much reputation. On the other hand, when the construction industry sees a contractionary phase, the suppliers bear an enhanced risk of having inventories while those brick kilns and dealers having high reputation can continue to have demand as well as stock their unsold production for future sales.

3.7 Price determination

The price of the brick is heterogeneous in the bricks market. Seasonality, long term relations, bargaining power, demand and supply, trust and quality are factors in the markets that have been influencing the price of the bricks. In the above table it is clarified that the price of the light weight brick is a little higher than the heavy brick. The price which is paid by the suppliers to owner of the kiln may change and are

influenced by the above mentioned factors. The average price paid to the kiln by suppliers for a light weight and a heavy brick of Rs 4.30 and 4.08 respectively in the Adda. Whereas in the case of the price paid by costumer to supplier it is difficult to estimate because a load of bricks are not in the uniform price, the price charged to the costumer is decided based on many factors such as the quantity of the bricks he purchases- since bulk quantity purchaser pay lesser than the others, relationship and bargaining power.

Even In case of the dealers operating in other than Adda markets, the price at which bricks are sold to different consumers is not the same. However, the spot price fixed for bricks in the Adda is uniform in the Adda market since the dealers are few and well known to each other and they always maintain same spot price so as to prevent losing the consumers. The average price of light weight bricks and heavy brick in case of spot payment are Rs.4.60 and 4.40 respectively. This price will also change, but change uniformly when there is scarcity in the Addas, and the dealers uniformly change the price accordingly.

Chapter-4

Segmentation of the Construction Sector and the Bricks Product Market

This chapter explains the relationship of the segmentation that exists in the construction sector in general and more specifically in the brick kiln industry with reference to the production systems, product market, nature of contracts, intermediary agents as well as modes of marketing and amongst the consumers with the segmentation that exists in the resources or size of the capital held by various producers and consumers, variety of costs and risks pertaining to different types of markets, segmentation in the quality of the products and standards expected by consumers and finally the segmentation in the prices as a derivative of all these dynamics.

These dynamics broadly are determined on one hand by the prospects of those products such as the cement bricks, hollow bricks, CLC, ACC etc., which are seen as substitutes to the traditional bricks, on the other side there is a transformation in the traditional brick industry itself in terms of a shift away from the mud bricks to clay bricks as well as an enhanced use of fly ash and other such inputs to suit to the changing nature of the demand. Understanding these dynamics is important for the understanding of the major changes that have taken place in the brick kiln production and the future prospects of the brick kiln industry itself. In order to understand these dynamics, a sample of production systems engaged in production of a variety of bricks, construction agencies, intermediary agents etc., have been studied. While the reason behind choosing different agents is to understand the nature of segmentation that permeates the construction sector, the actual choice of the concrete set of respondents for this research has been made randomly by snow ball method.

4.1 Sample design

The sample of respondents include 21 construction projects (excluding dealers and suppliers) from each of the different construction segments referred to commercial, residential, public utility. As it has shown in the below table there are two (2) commercial, Eighteen (18) residential, two (2) public utility projects. These samples are randomly taken by the using snow ball method.

Table: 4.1 categorization of sample size into different construction segment

Category																																																					
Commercial																		Residential																		Public utility																	
2																		17																		2																	
Low value						Medium value						High value						Low value						Medium value						High value						Low value						Medium value						High value					
-						-						2						7						2						8						2																	
Traditional			Other			Traditional			Other			Traditional			Other			Traditional			Other			Traditional			Other			Traditional			Other			Traditional			Other			Traditional			Other			Traditional			Other		
-			-			-			-			-			2			6			1			2			-			1			7			2			-			-			-			-			-		
s	m	I	s	M	i	s	m	i	S	m	I	S	m	i	s	m	i	s	m	i	s	m	i	S	m	i	s	M	i	s	m	i	s	m	i	s	m	i	s	m	i	s	m	i	s	m	i	s	m	i	s	m	i
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	3	3	-	-	1	-	-	2	-	-	-	-	-	1	-	4	1	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: primary survey

s- Single kiln, m- Multi kiln, i- In-house production

4.2 Construction sector in India

The construction sector in India is the second biggest sector after agriculture; it is providing employment opportunities for 35 million people, attributing about 11 percent of Indian GDP, total size of the market is figured Rs.2, 48,000 crores (35,640 million €).[41]The total construction market in India for FY2014 (fiscal year ending March 2014) was US$157 billion, a growth of US$4 billion over FY2013. Infrastructure accounts for 49%, real estate and housing 42% and industrial projects 9%.[42] Indian construction sector has been segmented into three:

1. Real estate sector which contains commercial, residential, retail construction, malls and other buildings.

2. Infrastructure buildings include railway, Sewers, bridges, roads, tunnels, power and other public sector institutional projects.

3. Industrial constructions include various manufacturing goods and service sector production units.

This study concentrated on the real estate sector which includes commercial, residential and other buildings.

4.3 Construction agencies and brick kilns

Construction agencies are the prime consumers of bricks. Brick industry can be broadly categorized into two types: 1. Clay bricks and 2. Cement and other brick industries like hallow brick, ACC, CLC, etc. The clay bricks are of two types: one is light weight bricks and other is heavy bricks. The cement and other bricks can be divided into fiber bricks, light weight brick, rubber bricks and hollow bricks and CLC bricks which are

[41]Extreme Weather Events and Climate Change Impact on Construction Small Medium Enterprises (SME's): Imbibing Indigenous Responses for Sustainability of SME's Shubham Gandhi*, Anik Gupta and SanchitSethi Department of Environmental Engineering, Delhi Technological University, Delhi, India

[42] New report forecasts boost for India's construction sector in 2015

mostly used for high valued construction projects since they are made up of standardized raw material and are relatively eco-friendly. The energy consumed in the production process is only a fraction compared to the production of other materials and discharges relatively lesser pollutants and the producers claim that they creates lesser or even no toxic products or by-products. The CLC bricks provide thermal and sound insulations and also fire protection and also eliminates the need for many layers of plastering and do not supposedly release any toxic or dangerous gas when exposed to fire. These bricks also seem to have an architectural value in that they are extremely strong and of customized shape thus taking less quantity of cement and plastering and give the desired shapes to the construction.

AAC Blocks (Autoclave Aerated Concrete) Blocks, which are innovatively manufactured with advanced and sophisticated AAC technology in combination of slag, cement, fly-ash, lime, gypsum, sand and Aluminum powder. Because of their high quality, attractive and impressive strength AAC Blocks are highly demanded in civil construction industry. AAC **Autoclaved cellular concrete (ACC)** Blocks are indigenously developed keeping in mind the industrial and environmental situations in India.

Even though cement and other bricks have advantage over the clay bricks, it can be observed that all the types of bricks are used for consumption in the market, depending on the nature of the construction project. It seems that high valued construction agencies have been diversifying into the ACC, CLC and other light-weight bricks which are manufactured by the modern technologies. The future of the traditional brick industry with reference to the expected demand from the high valued constructions seems bleak. In these circumstances mud and clay bricks are used on a large scale by the low valued construction projects. The underlying dynamics need to be inquired into.

4.4 Brief introduction of Mud and clay brick industry

Brick industry is acknowledged as the industry of the poor, most of the clay brick industrial workers are in virtual or actual slavery. Till today brick industries have been

applying the primitive or old technologies, only a very small fraction of global production uses modern mechanized technology, about less than 10%.[43] Developing countries', such as India, Bangladesh, and Pakistan etc. attempt to reduce air pollution and land, environmental impact of brick kiln had only limited success. Even though the western countries have succeeded in reducing air pollution and solid consumption by introducing new technologies and alternative products to mud and clay bricks, Western developmental agencies have achieved very limited success in attempting to upgrade developing countries' brick kiln technology.

The growth of population and urbanization have been inducing brick production in most countries, India's brick kiln production is increasing by 5-10% a year (2009 estimate), Bangladesh has registered the growth of brick kilns by about 5.6%(2008) but China is intensively searching for alternatives and attempting to reduce the use of solid bricks to reduce pollution and soil degradation.[44] There are almost 300000 kiln situated worldwide and producing 1350 billion bricks per annum , but brick kiln production is concentrated in few countries, particularly four countries have occupied and absorbed 75% of the total clay brick production, they are China, India, Pakistan, Bangladesh respectively.[45]

Table 4.2: Clay Brick Kilns' annual production of different countries

Name of the country	Percentage of production in total world production	Number of brick production in billion per year.
China	54%	700-800
India	11%	140
Pakistan	8%	100
Bangladesh	4%	50

Source: Ellen Baum 2007; pg. no, 5.

[43]BLACK CARBON from BRICK KILNS, Ellen Baum, April 2007;

[44]BLACK CARBON from BRICK KILNS Ellen Baum Senior Scientist April 7, 2010.

[45]USE OF BIOMASS IN BRICK KILNSSHUCHI VERMA AND JAI UPPAL, February, 2013.

The above table depicts that China is producing more than 50% of total clay brick production and is placed in the first position and India producing 11% as second largest producer but it is five times lesser than the China's production. Bangladesh and Pakistan are producing 8%, 4% as the third and fourth of the world's largest clay brick producers respectively.

Brick kilns can be divided into two types namely:

1) Intermittent Kilns

2) Continuous Kilns

The intermittent kilns are Clamps, Scotch, Scove and Downdraft kilns. Clamps are the oldest brick kilns found in 4000BC[46] and are common still in India. Continuous kilns are the Bull Trench (BTK), Hoffman, Zig-zag, Tunnel and Vertical Shaft Brick Kilns (VSBK), the Hoffman, zig-zag kilns invented in Germany. Bull trench is invented in Indian subcontinent and VSBK is invented in China.

4.5 Mud and Clay brick kiln in India

The rapid growth in India's economy and population, coupled with urbanization, has led to an increasing demand for residential, commercial, public buildings and industrial as well as other physical infrastructure. The building construction in India is expected to grow at a rate of 6.6% per a year between 2005 and 2013. The building stock is expected to multiply five times during this span of time, resulting in increased demand for building materials.

Solid fired mud and clay bricks are one of the most widely used building materials in India. India is the oldest and second largest producer of mud and clay fired bricks, constituting more than 10% of worldwide production.[47] India is figured to have more

[46]16 W.G.Curtin and F.Sawko, ***"Materials of construction of Developing countries",*** Asian Institute of Technology, Bangkok, Thailand, 1978, p.808.

[47]Maithel, Sameer, 2003. Energy Utilization in Brick Kilns. PhD Thesis. Energy Systems Engineering, Indian Institute of Technology, Bombay

than 100,000 brick kilns, producing about 150-200 billion mud and clay bricks annually[48].

Brick making in India is characterized by the following features:

1. Clay and mud brick making is a small-scale, unorganized and traditional industry or sector[49]. Almost all brick kilns are placed in the rural and semi-urban areas. It can be generally observed, large brick making clusters located around the towns and cities, which are the found that they are concentrated in the areas where there is a large scale demand for bricks. Some of these clusters have up to several hundred kilns.
2. The brick production process is based on manual labour since it is a labour intensive industry.
3. Brick production is seasonal in its nature, as the brick kilns do not operate during rainy season.
4. Most of the workers working in brick kilns are migrated and migrate with their families from backward regions of the country for example Odisha, Bihar, Uttar Pradesh, etc. Families, including young children, work in low paying and abrasive conditions, because of their poverty, unemployment at residency and illiteracy.
5. There is generally a lack of basic amenities like access to clean drinking water, proper shelter, food especially lack of nutrition to children.
6. The production sites of clay brick kiln resemble the slavery system since there is denial of the basic rights at work, child labor, long working hours, low wages, gender discrimination and sexual exploitation are generally noticeable.

[48] No agency in India keeps records of brick production. The numbers referenced here on brick kilns, total production and coal use are estimates that are often quoted by brick industry associations and experts.

[49] A traditional industry here is defined as "an activity, which produces marketable products, using only locally available raw material and skills and indigenous technology."

4.5.1 Clay and Mud brick sector input

Major issues and constrains recognized by brick makers that are likely to determine the future of the brick-making industry include:

1. Shortage of labour
2. Increase in coal and fuel cost
3. Competition from other alternative bricks like fly ash brick, cement, AAC and CLC etc.
4. Multiple constrains in adopting semi-mechanized technologies

Even though Indian brick kilns have been facing the hurdles, some of the kilns are shut down due the above mentioned factors. It has been contributing a lot to Indian economy according to the TERI (2007), mud and clay brick production is more than 14000 crores, the turnover per a year is Rs100 billion, providing employment opportunities to around 80 to 100 million.[50]

4.5.2 How are the clay bricks made

The process of brick making comprises mainly material procurement, tempering, moulding, dying, firing, and sorting. The production process has not changed much across geographies over the centuries.

The material procurement is the first step and producers have to get ready with the inputs for the production of clay bricks. The inputs required for production are clay, labour, land , coal and others like water, electricity, husk, tractors. The essential inputs of the brick making are clay and labour, the clay is mined and stored in open place, and therefore this makes clay smooth hence it is necessary for brick moulding and removes unwanted oxides. Tractors and other transport vehicles are needed if the clay is available far from the production site.

[50] The energy and resource institute 2007.

This stored and smooth clay is then mixed with water for sustained moulding and generally mixing is done physically with hands and feet. Sometimes and in certain areas, animal driven pug mills are used.

A lump of mix is taken, rolled in sand and slapped into the mould, initially these moulds were done by wooden boxes but now metal moulds are used, sand is mixed so that it shall not stick to the mould. The quantity of sand added to brick also differs with clay. Generally red soil clay doesn't require much sand compared to the other clay.

The mould is carried out into the dry area, where the bricks are arranged in a herring bone pattern to dry out under the sun. After every two days they are turned over to facilitate uniform dying and prevent warping. After two weeks they are ready to burn.

The dried bricks are arranged in a kiln and installation is done with a mud pack. Holes, which are left to fire up the kiln, are later sealed to keep the heat inside. This is maintained for a week. Firing and other activities also depend on the knowledge and experience of the brick maker and coal is main input to fire the bricks.

The final stage in the brick making operation is classification, where the fired brick is divided according to the color, which is an indication of burning, and well fired bricks are used for paving or covering the kiln while a bit less fired bricks under burnt bricks are used for inner walls or burnt once again in the next kiln.

Though the overall method of making brick remains the same, there are certain regional variations considering the climatic conditions and local soil. In different areas, different soil types are utilized with respect to local situation. The three general approaches for firing bricks include using a massive fire, a massive volume and insulation. In South America and Africa, a massive fire using wood fuel is built, and insulated with grass or mud. In India and Mexico, they fire large volumes together and the volume itself acts as an insulator to prevent escape of heat. Fuel ranges from wood to coal, biomass to even garbage and trash in the absence of others

4.6 Construction agencies and mud and clay bricks

The clay brick is the oldest and highly consumed traditional product for the constructions as material. It has been contributing significantly to the construction sector as an input since ages. Rapid growth of the population and urbanization and decent housing programmes have been the crucial factors in the rise of this industry. The mud and clay brick industries, which are labour intensive, are competing with the cement, hollow brick and other brick like ACC and CLC industries, which are modern and have an important place in modern building industry. They are cost effective and better alternative to burnt mud and clay bricks by virtue of their good durability, light weight (important especially in the context of multi-storied high-rise buildings), good quality, partial resistance to sound, fire resistance, thermal insulation, and high speed of construction and producing by the well-established, high capital, mechanized and semi mechanized and organized sectors on a mass scale.

Despite the fact that clay brick is a product which is made by the unskilled and illiterate and poor migrated workers, it has penetrated into the well-established organized construction agencies in the sample of agencies studied like the Nagarjuna constructions company (NCC), which is one of the top construction agencies and Adithya construction, which is well established construction agency in Hyderabad. The construction agencies which are using cement, hollow, ACC, CLC, and other modern brick are also consuming clay brick for the interior walls because these bricks occupy less space. For example GMR constructions and Lodha Constructions which took up the big project worth RS 2000 crore. These agencies are also using clay bricks to construct temporary shelters for workers and likewise many construction agencies are consuming products produced by the traditional unskilled labour based production systems.

Table 4.3: The price, expected cost of the construction project and number of kiln depending upon for out sourcing

Sl No	Name of the Construction agency	Average Price of bricks	Expected cost of the project	Brick Kilns depends on
1	Gayathri constructions	4.80	1 crore	Multi
2	Gayathri constructions	4.80	70 lakh	Multi
3	Adithya constructions	5.25	70 crore	Multi
4	Chenmay constructions	4..60	4.5 crore	Multi
5	Nagarjuna construction	4.80	57 crores	Multi
6	D E C Infrastructure pvt ltd	6.00	6.5 crores	Multi
7	Ramkrishna	5	2.75 crore	Mutli
8	Sri saikrupa avenues	4.20	40 lakh	Single
9	Gayathri classics	4.60	1 crore	Single
10	Ramana construction builders and engineer	4.30	30 lakh	Single
11	Srinivasrao	4.60	3.5crore	Multi

Source: Primary survey.

The above table explains average price, the total expected cost of the construction project and the number of kilns it is depending upon for bricks. The price determination between the constructions agencies and owner of a kiln is not like usual market where market demand and supply determines the price. Even though there is no formal long term relation between them such as written contract, relation between the owner of the kiln and construction agencies play crucial role in the price determination. The price

which has been paid by the construction agencies is not uniform among the construction agencies and the kilns which are supplied to same construction agency. Along with the long term relations (informal relations), quality of the brick and bargaining power are the determining factors of brick price.

The above table clarifies that clay bricks are used mainly by small construction agencies and builders, except Adithya and Nagarjuna construction agencies. The average price of a brick is Rs. 4.81. The construction agencies are relying on multiple brick kilns so as to escape the insecurity of delay in delivery, to get low price and they have fear of assured supply from traditional brick kiln suppliers and moreover single brick kiln is not capable of supplying the bricks required for the entire construction project since clay brick kilns are of small scale, with limited capacity. The construction agencies which are depending upon the single kiln are Ramana construction builders and engineers, SaiKrupa avenues and Gayathri Classic belong to the lowest value of the low budget segment construction agencies. These construction agencies are small and have been maintaining and depending on the single kiln since long period. They have more advantages than the construction agencies which are depending on multiple kilns. These will be discussed below clearly.

The construction agencies which are enlisted in the above table except Adhitya, Nagarjuna DEC have no time constrain to finish project hence a little delay is acceptable and there are many advantages in maintaining the long term relations. There will not be any punishment like reduction in payment and rejection of product for delay, but always keep a stock of bricks with them in their go downs for smooth and continuous progress of construction. The construction agencies and clay brick kiln do not have any formal agreement to ensure the quality and time bound delivery unlike in the case of cement bricks. Trust is the only factor which ensures quality, as well as time bound delivery and payment and this leads to long term relation between them, any disrepute acquired by a brick kiln supplier could hamper the long term relationship with the construction agency.

The construction agencies which are bigger in size but yet using traditional bricks are depending on multiple kilns. They are doing so for two reasons; One is single kiln may not be able to supply the quantity of bricks required by the entire project. Second if any kiln fails to supply it should not affect the project, immediately other kiln would compensate for the quantity of bricks required.

Another segment in the construction industry is by category in the construction of residential houses is *mestries.* Mestry is a person who builds the houses on agreement. According to this agreement budget for the construction of a house is pre-determined and the mestry has to finish construction with in the budget. The mestry has to pay wages and other expenses out of the pre-determined budget after all the expenses the amount remained are considered as profit.

The above table 4.3 clearly indicates that the construction agencies with less budget like Gayathri classic builders and infrastructure developers, Sai Krupa avenues, Ramana construction builders and engineer prefer bricks which are of lower prices compared to the other construction agencies. These are the agencies which are depending on the single kiln for bricks, these construction agencies also have low budget, interestingly budget of the construction agency and price of bricks has close relationship, where higher budget construction agencies like DEC, Adihya, Nagarguna construction agencies are paying higher price respectively than other construction agencies. The quality of the brick also play key role in determining the price. Thus, while the low value end agencies aim for cost cutting, the high value end agencies seem to be more focused on the aspect of quality in their decision making. Above mentioned construction agencies are giving priority to the quality; the DEC and Nagarjuna constructions agencies are using the lab testing method to examine the quality of the bricks and Adhithya is using the quality check machine for the quality examination which influence the price is number of kilns it depends upon for outsourcing. The construction agencies which are depending upon the multiple kilns are paying high price of Rs 4.97 which is higher than the construction agencies which are sourcing from the single kiln and the overall average price being paid by all construction agencies.

Table4.4: Plinth area, number of brick required for project, total amount required and proportionate brick cost out of total project cost

Sl No	Name of the construction agency	Plinth Area(sqft)	Total required for construction project	Total cost of brick in Rupees	Proportion brick cost in total project cost
1	Gayathri constructions	14,22,090	11,376720	40550	6
2	Gayathri construction	93600	748800	125184	6.008
3	Adithya constructions	124910.28	999282	59727780	8.5
4	Chenmay constructions	15714	125712	3444480	7.65
5	Nagarjuna construction	10560	84480	28549632	6
6	D E C Infrastructure pvt ltd	15648	125184	5995632	9.22
7	Ramkrishna	743480	5947840	1810560	6.58
8	Sri saikrupa avenues	5490	43920	254016	6.35
9	Gayathri classics	45264	362112	578275	6.28
10	Ramana construction builders and engineer	7560	60480	188856	6.29
11	Srinivasrao	56760	454080	2088768	6

Source: Primary survey.

The above table shows the quantity of bricks required for a construction project and proportion of the value which has to be spent on the bricks from the total cost of the construction project. It is clear that the price of the bricks is not uniform, differing among the customers in adda and several construction agencies. Standardizing the size of the brick, it is estimated that about Eight bricks are required for a square feet of construction. The total quantity of bricks required depends on the size of the construction project. In above table it is depicted that plinth area of the project and cost of the bricks in the total project has the positive relationship. The average cost proportion between the construction agencies which are depending on the single kiln, such as Ramana construction and engineer, SaiKrupa avenues have the lower investments and they get bricks at low price and the average cost proportion is 6.19%. Those which are depending on the multi kiln, the big construction agencies, need to pay more, and thus the proportion of expenditure incurred on bricks increases to about an average of 7.0% of the total expenditure.

The owners of the brick kiln and construction agencies have close relation with each other, this relation makes the transaction between the two more often. The delay in payment to maximum 15-20 days is acceptable and construction agency has the advantage of rejecting the bricks if they find it of less quality and damaged, in such cases the whole risk has to be borne by the kiln owner. A vehicle to transport bricks from kiln to the construction agencies is a necessary one for the kiln owner; cost of transportation is borne by the kiln owner only. The fear of losing the costumer and increased competition among the kilns, rapid penetration of other alternative brick industries along with small scale cement brick industries, are weakening the clay brick kilns in terms of bargaining power, and capacity to influence the construction agencies. These factors are pushing the brick kilns towards taking greater risk.

The network between owner of clay brick industry and construction agencies can be established through different channels. In some cases the kiln owner approaches the construction agencies directly and in other cases the agencies get the information through other construction agencies and friends in the same field. In the first case the

construction agency has advantage of bargaining, they choose the kiln who supply at low price with good quality. In the second case, the construction agencies approach the kiln, agencies have less bargaining power therefore the owner of the kiln has the advantage. Generally it is a rare case because the number of the clay brick kilns has been increasing year by year. Currently almost 1,45000 registered and unregistered kilns are existed.[51] At the same time there is trend towards the increasing of alternative bricks which are relatively eco-friendly, light weight, better in term of standardized quality and assured in terms of mass supply compared to clay bricks.

4.7 Quality determination methods of traditional brick used construction agencies

Table 4.5: Quality checking method of different clay brick construction agencies

S.NO	Name of Construction agency	Quality checking method
1	Gayathri constructions	Crude
2	Gayathri constructions	Crude
3	Adithya constructions	Accurate
4	Chennareddy constructions	Crude
5	Nagarjuna construction	Accurate
6	D E C Infrastructure pvt ltd	Accurate
7	Srinivasrao constructions	Crude
8	Sri saikrupa avenues	Crude
9	Gayathri classics	Crude
10	Venkateshwara avenues	Crude
11	Ramana construction builders and engineer	Crude

Source: Primary survey.

[51] http://pscst.gov.in/pscstHTML/brick.html.

There are several crude methods of checking the quality of bricks these methods include; dropping bricks from a certain height, if the brick is broken it is considered as of poor quality, the quality of the brick can be checked by soaking in the water, if it does not disintegrate easily, it can be considered as a high quality brick, moreover, the color of the brick is also taken into consideration, if it is more red it is of quality and less coloured bricks are considered as signifying poor quality bricks.

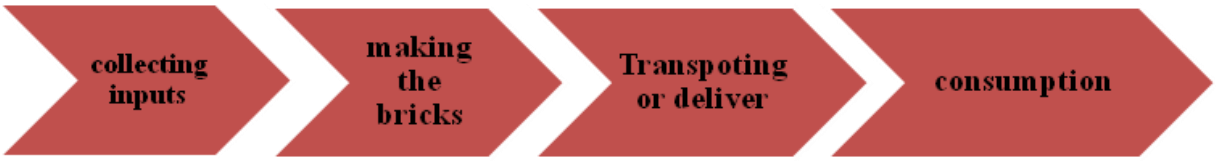
As against these crude methods, more modern construction agencies resort to techniques that have far more scientific validity and therefore have greater accuracy in the determination of quality. Accurate checking is done by the quality checking machine and lab testing of the bricks, if the brick does not satisfy the required standards of the construction agency, it will be rejected and considered as a poor quality product.The above table indicates that out of the eleven construction agency projects which have been using clay brick for construction, only three construction agencies namely Nagarjuna, Adithya and DEC infrastructure Private Ltd. constructions are employing the accurate method of quality checking methods and rest of the agencies are practicing the crude method of quality checking. It means 72.7% of the construction agencies are practicing crude method and 27.3% accurate method in availing clay bricks. The construction agencies which are using the accurate methods of quality checking are the reputed construction agencies and have higher demand from elite consumers for their constructions; hence they have to give priority to the quality of the product to sustain in the market.

It seems that the construction agencies with the low budget are not giving priority to the quality of the bricks; they trust the kiln in terms of quality more than any others, who employ accurate methods of quality check. The construction agencies such as DEC infrastructure PvtLtd, Adithya construction, Nagrjuna construction are employing the accurate quality check methods, like machines and lab testing and are paying more price than the other construction agencies to an average of Rs 6.00 per brick, Rs5.25, Rs4.80 respectively. The cost proportion of clay bricks in the total cost of the construction projects are 8.5%, 9.22% and 6% respectively. With the exception of the Nagarjuna

construction agency rest of the construction agencies, are paying more price than the average price and same is the case in terms of cost proportion also.

4.8 Production and marketing network chain of brick kiln product

Map 4.1: Different stages and governance along the clay brick chain



Source: primary study.

Production and Marketing Networks Chain definition generally explains how the products reach to the final consumer from raw material or initial stage of a product or service to intermediate stage and how the product is supplied to the final consumer. The brick kiln networks chain starts with the mobilisation of the inputs which are required for the production of bricks. Clay, labour, coal, husk, land are the main inputs. Immediately after this mobilization phase, the second stage is manufacturing bricks, which includes the activities like mixing smooth clay with water, molding clay into shape, dying the wet bricks and arranging in a kiln and installation is provided with a mud pack, fired holes are left to ignite the kiln and are later sealed to keep the heat inside and burnt bricks are eventually separated.

The burnt bricks are transported either directly to the final consumers or through actors like suppliers and dealers, Suppliers and dealers are not the final consumers, these are intermediary traders. The final consumers in case of the brick kilns are individual house constructions and construction agencies which construct residential, commercial construction and other buildings.

The question of governance emerges when the actors along the chain act according to rules set by others like Government, NGOs, labour unions and Human Rights Forums etc. These are governed in two ways, some of them influence from outside (external governance) and some from within the chain (internal governance). Brick kiln chains get influenced and affected by different actors along the chain from production to final

consumer. At the stage of inception the brick kiln has to encounter the environment laws to reduce pollution and land erosion.

In the process, Kilns need to satisfy the labour laws such as minimum wages, inter-state migrant workmen Act, child labour Act etc, which govern the production process of the brick kilns. Apart from this legal governance, other agencies like NGOs, human rights forums and labour unions also influence the chain at the stages of clay brick making and transportation. The studies on the mud and clay brick industries show that these laws are not being adhered to by the mud and clay brick productions and at every stage these laws are being violated by kilns.

The final stage of clay brick is consumption, starts with the examination of minimum quality standards of clay bricks through the random quality methods and accurate methods such as lab testing and quality check by machine. Other important links in the chain are fear of losing costumers, which is always used as weapon by construction agencies leading to supply of quality product at desired price and on time delivery of consignment. Informal contract between them generally does not ensure legal claim on contract, but trust and long term relations play key role in the sustenance of these network relations for over a long period of time.

The fact that construction agencies do not regulate the manufacturing practices of the brick kilns from where these agencies source their bricks from. The construction agencies therefore are not concerned about the working conditions in the brick kilns, what they are focused on is the quality of the bricks and on time delivery of the product. . Brick kilns have to produce quickly to deliver the consignment on time, this pressure in fact makes working conditions more vulnerable for the labour and increases the number of working hours indirectly. All the kilns deliver the consignment on time and seldom delay. The delay in payment also influences the worker's conditions indirectly. From big construction agencies like Nagarjuna and Adithya to small builders like Sri Sai Krupa avenues all the construction agencies delay the payments to the brick kilns and it

therefore influences the brick kiln owner's capacity to pay the workers' net wages towards the end of the season.

The delayed payment to consignment is not received at once, rather it is received under installments. There is no a priori information available with the brick kiln producer along the network chain from the construction agency about the quantity of bricks required. However, as a consequence to long term network relations, the average quantity of demand is anticipated by the brick kiln owners based on their experience. The kilns are generally informed of what is the total requirement of bricks for the project at the beginning of the construction project. However, this requirement assessment is not a statement of assured demand for the brick kilns. Construction agencies do not depend on the single clay brick kiln for its supply therefore how much it will actually buy from brick kiln is then left to other dynamics like quality and time lines. Every brick kiln informs their capability of supplying brick stock. The brick kiln producers on the other hand do not depend on the single consumer either, therefore the construction agency does not have an assured supply. It is amidst these uncertainties that trust formation and networks have to emerge and sustain in these markets.

4.9 Upgrading and Relationship between clay brick kiln and construction agencies

Generally the value chain literature explains possibilities of upgrading the product and actors along the chain. The ILO value chain frame works explains that upgrading in the value chain leads to decent work conditions along the chain. The dominant feature of the Indian clay brick industry is that it employs the labour, who are distressed and migrated and common elements of these labourers are indebtedness, illiteracy, poverty and unemployment at the native place. These clay kilns are known for their indecent working conditions, low wages, and excessive hours of work, low hourly pay, child labour, sexual harassment, and gender inequality, lack of bargaining power, no union, no voice at work place, use of threat and violence, verbal abuse, hazardous working conditions and no basic amenities in the living conditions.

Even though there is no formal long term contract between the construction agencies and owners of the brick kiln, relation between them is informal but long term. Most of the agencies always try to maintain the long term contact with the kilns, which give them an advantage of more delay in payment, get quality bricks at low price.

But this long term relationship between them generally has to induce for upgrading the quality product and according to the ILO frame work long term relation between the formal sector and informal sector supposed to provide decent work conditions in informal sector because these informal sectors are directly contributing to the formal sectors growth. In reality these construction agencies are ever interested in the up gradation of the quality of the bricks, technologies in bricks making only. These construction agencies do not care how the bricks are made and at what circumstances, they have only contacts with the owner of the kiln and ever concern the conditions of the work in the brick kilns.

Even though there are many advantages by using fly ash and cement bricks, some of the construction agencies have been using both bricks such as clay bricks and alternative to clay brick, fly ash, cement and concrete bricks ACC,CLC, etc. Some of the construction agencies are using clay brick on some construction project and cement brick and other alternative on other construction projects.

Table 4.6: Construction agencies use both clay bricks and other alternative bricks

Sl.no	Construction agencies	Clay bricks	Cement concrete hollow bricks
1	Nagarjuna constructions	Gachibowli	Telapur
2	Adithya constructions	Tolichoeki, Telapur	Telapur
3	Gayathri constructions	Telicomnagar, madhapur	Madhapur
4	GMR constructions	Gowlidoddy	Gowlidoddy
5	Lodha constructions	Madhapur	Madhapur

Source: Primary survey.

The construction agencies shown in the above table are using the both bricks, traditional clay bricks and other alternative bricks. The use of clay bricks or other bricks depends on the design and time constrain of the project, expected cost of the project and type of the construction project whether it is commercial complex, high valued residencies, malls or residencies which are affordable by the middle and low value construction. The use of clay bricks and time constrain and budget of the project has the close relationship. Except Nagarjuna and Aditya construction agencies, all others have a budget lower than Rs.10 crore . Construction agencies such as Lodha (Madhpur) and GMR construction (Gowlidoddy), have been using cement bricks but only for the interior walls and tanks on the towers and shelter for workers etc., clay bricks forms a small proportion of the total cost including alternatives to traditional bricks.

Some construction agencies are making their own cement bricks on the construction site others are purchasing the bricks from kilns.

Table 4.7: Construction agencies which have on production site of bricks and expected cost of the project and proportion of brick in the cost of total production cost

S.no	The Construction agencies with own brick kiln production sites	Expected cost of production(In rupees)	Proportion of bricks cost in total production cost (In percentage)
1.	Lonco hills	300 crore	6%
2	Aparna constructions	250 crore	5%

Source: Primary survey.

The construction agencies which are producing bricks in-house have an advantage of availability of high quality bricks at low the price. These construction agencies give priority to the high quality, they are using the quality check machine to examine quality of product and each and every brick goes under the quality check before being used. The proportion of the bricks cost in total production cost is lower than the other construction agencies, which purchase from the brick kilns. It is around 5.5% on an average but in case of other agencies which are buying from kilns it is more than 7 % on an average. The construction agencies which have the own brick production sites are top construction companies, it means companies with low investment are unable to set up in-house brick production facility, it needs man power and land for production; it has to invest on both constructions and production of bricks. The construction companies with low investments are unable to maintain both construction and production of bricks and therefore they depend on the brick kilns for their requirements.

Table 4.8: Construction agencies which use other alternative bricks and expected cost of the project, proportion of brick cost in total project cost number of kilns it depend and types of payment

Sl.no	Construction agencies	Expected cost of project	Proportion of brick cost	Brick kilns	Payment
1	Adithya constructions	130 crore	7-8	Multi kilns	Delay in payment
`2	Nagarjuna construction	50 crore	6-8	Multi kilns	Delay in payment
3	RamKrishna constructions Bengaluru	13 crore	6	Multi kilns	Delay in payment
4	GMR construction	50 crore	7	Single (KCB)	Delay in payments
5	Vajra construction	500 crore	8 -9	Single kiln (KSP)	Payment on delivery
6	Incorinfrastruction	14 crore	6	Multi kilns	Delay in payment
7	Lanco hills constructions	300 crore	5	Own kiln	___
8	Aparna construction	250 crore	5-6	Own kiln	___
9	Pranith construction	500 crore	7-8	Single Well bricks	Payment on delivery
10	Lodha constructions	2000 crore	8 -9	Single Ultratech	Payment on delivery

Source: Primary survey.

The above table shows the proportional cost of bricks in total cost of the project and how it varies across different construction agencies. The construction agencies which have own production site of bricks have low cost proportion in total cost of the project, it is

around an average 5.5%. So it is clear that the construction agencies with own production unit have lowest cost proportion than others. The construction agencies which have been purchasing from the multi kilns are paying higher cost than the construction agencies with own production site. The construction agencies which links to the single and multi-kiln has an advantage of delay payment but the construction agencies which are approaching the single kiln has more advantages than the other. The single kiln dependent construction agencies are giving more priority to the quality and high valued and high budget construction project.

Table 4.9: Methods of quality checking by alternative brick consuming construction agencies

Sl no	Name of the construction agencies	Quality checking method
1	Adithya constructions	Accurate
2	Nagarjuna constructions	Accurate
3	RamKrishna constructions Bengaluru	Crude
4	Ramki constructions	Accurate
5	Vajra constructions	Accurate
6	Incorinfrastruction	Crude
7	Lanco hills constructions	Accurate
8	Aparna constructions	Accurate
9	Pranith constructions	Accurate
10	Lodha constructions	Accurate

Source: Primary survey.

The above table shows methods of quality checking. In case of the construction agencies who use clay bricks, only 27.3% of construction agencies have been employing the accurate methods to check quality of the brick. But in case of the other alternative brick consumption construction agencies only two construction projects they are Ram Krishna

constructions Bengaluru pvt ltd and Incorinfrastruction are using the crude method of quality checking and interestingly these construction projects are with the low expected cost (low budget) construction projects. Nearly 80% of the construction projects using alternatives to traditional bricks are employing the accurate quality methods. It clear from the table that even in the case of construction agencies who are using the cement, concrete, fly ash, ACC, CLC, etc. the low investment construction agencies are not applying an accurate methods, the low cost/ budget construction agencies are not giving much priority to the quality of bricks and high valued or budget constructions agencies are giving much priority to quality of bricks.

4.10 Advantage of cement and concrete fly ash ACC, CLC, etc. bricks over the traditional clay bricks:

The high valued construction agencies using alternatives to traditional bricks project the usage of alternatives to traditional bricks in several ways for their marketing and improving their brand images. Some of the characteristics which are usually projected by the high valued construction agencies are as follows:

1. Cement bricks and other bricks like fly ash bricks eco-friendly in comparison to the clay bricks which use mud and coal as prime input, clay brick kilns are polluting environment by expelling of black carbon (BC), carbon monoxide (CO) carbon dioxide (CO2)and , sulfur dioxide (SO2). Traditional clay brick industry has been using agriculture and forest land for production, this is the major cause of land degradation and erosion, and cement and fly ash brick consume zero solid in production.

2. Fly ash is waste of coal based thermal power plant and in term of quality also these fly ash bricks are better than clay bricks.

3. When it comes to labour issues cement, fly ash brick are mechanized or semi mechanized and less labour required for production and working under the

organized sector and contributing to the government by paying taxes but clay brick industry is labour intensive, most of them are unorganized small scale sector.

4. The cement and other fly ash, CLC, ACC bricks have higher moisture resistance as their water absorption ability is much lower than clay bricks, this boils down the chances of dampness of walls, and especially fly ash bricks do not observe the heat rather they reflect so this good for the home in countries like India, where majority part of the year it is hot.

5. Especially fly ash and ACC, CLC bricks are lighter in weight than ordinary solid fired bricks. This makes construction work easy and fast, as brick size is bigger but lighter than traditional clay brick bricks. Smoothness of the bricks reduce the cost of plastering also, it reduces the overall building cost.

6. Damage of the cement and fly ACC, CLL bricks because these brick use no solid and input uses in the production of these bricks are not subject to break, they are very good in quality.

7. Gypsum plaster (plaster of Paris) can be directly applied on fly ash bricks without a backing coat of lime plaster, which makes wall smooth and attractive.

8. If bricks are used for decorative purposes, then concrete brick may be better option, because it comes to brick shape and size, concrete is a much more versatile product. Concrete brick comes in several of shapes from squares and triangles to octagons and trapezoids. Clay, on the other hand, is in general limited to more traditional shapes such as rectangles. Concrete can also stamp or texture to provide unique visual appeal.

4.11 Cement Concrete hollow fly ash brick, ACC, CLC, etc. Vs. mud and clay brick industry

As explained above the cement, concrete hollow bricks are projected as being more advantageous than the mud and clay brick industry and these brick industries are a labour intensive and cement and other alternative bricks industries are either semi and fully mechanized capital intensive industries. The cement, concrete, fly ash bricks industry products broadly can be divided into the four. They are concrete, hollow bricks, ACC, CLC which are light weight and reduce the cost of plastering, steel and labour cost of the construction agencies and which are used by almost all high value construction agencies. Almost all the commercial buildings, residential towers are using these bricks only and these bricks are being produced by big manufacturing corporations and building material suppliers because it needs expensive modern machine, and technology.

The clay brick kilns are becoming mere suppliers to the small residential construction projects which are generally low budget (low expect cost of the project).The industries such as Brickwell, Ulrtratech and KSP industrial groups, Aparna and Lanco construction agencies etc. are penetrated into the bricks market, they made situation vulnerable to mud and clay brick industries and this indirectly affects the employment avenues for the workers too. These mud and clay brick industries are not capable of producing standardized quality and assured mass quantity in comparison to the modern, mechanized and high capital intensive industries. These big cement, fly ash, concrete, CLC, ACC bricks occupied most part of the construction agencies, especially agencies with the high budget as mentioned in the above table except Ramkrishna Bangalore pvt ltd and Incroinfrastructure ltd all other construction agencies where the cost of the project exceeds Rs.100 crore .

The construction agencies which are using the clay bricks have expected cost of project (budget) which is less than Rs.7 crore except the Nagarjuna and Adithya construction agencies. These construction agencies expected cost also less the Rs.100 crores but these constructions are meant for affordable residential markets (Adithya Towers) and public or government constructions (Narjuna constructions). It is clear that penetration of the big cement, concrete, hollow, ACC and CLC brick industries have been reducing market

for the traditional labour intensive, small scale clay bricks industries, and indirectly making these clay bricks industries more vulnerable in terms of bargaining power since it makes kilns in favour of costumers (construction agencies). Reduced demand for product in the market and the increased uncertainty and risk have triggered off an extremely exploitative set of labour relations in an industry which has always been cost cutting and a chronic violator of prescribed legal norms.

4.12 Nature of the construction projects who use clay bricks

It is very clear that the clay brick industry has become a mere supplier to the low valued construction agencies and recession in the real estate sector also turned the real estate to attract the middle income group. It can be observed that high vacancies of mall and commercial complexes and high valued luxuries residencies pushed the even big construction agencies in to the debt, to pay the loan these construction agencies also focused on the middle income group affordable constructions, it means low cost residencies. It also may be the reason for sustaining of the clay brick industry. Due to the penetration and market domination held by the cement, concrete, fly ash, ACC, CLC bricks in the market, since they are more advance in terms of technology, quality, and assured mass production the clay brick industry is not able compete with these industries. The clay brick industries are predominantly supplying to the individuals constructing houses, low valued and affordable residential constructions for example Saikrupa avenue residency construction project and Ramana construction, Adithya, Chinmay, Gayathri, Gayathri classics construction etc., semi urban constructions, decent housing programs such Indira Gandhi housing plans and Rajiv Swagruha, Rajiv GruhaKalpa and other government or public constructions such as the Nagarjuna construction project at university of Hyderabad and railway quarter project of the DCE Pvt Ltd construction are using the clay bricks.

Chapter-5
Conclusion

This study consists of five chapters; the first chapter presents introduction and review of literature and it gives the brief introduction of brick kiln industry in global, national and local context and also gives information regarding different types of development programs introduced in India. The review of literature provides theoretical framework and approaches to the problem under study. The second chapter explains the methods of data collection which are used in present study and also provides a background to the study area where field study has been carried out, reason behind selection of present study, research questions, and objectives of study and research tools used in the present study have been presented. Third chapter looks at the issues related to the market dynamics of the bricks market and different actors in this market, price and quality determination, relations between different agents and how risk is borne by different actors. Fourth chapter explains the relationship of the segmentation that exists in the construction sector in general and the brick kiln industry in particular, with reference to the production systems, product market, nature of contracts, intermediary agents as well as modes of marketing amongst the consumers with the segmentation that exists in the resources or size of the capital held by various producers and consumers, variety of costs and risks pertaining to different types of markets, segmentation in the quality of the products and standards expected by consumers and finally the segmentation in the prices as a derivative of all these dynamics. The fifth chapter summarizes the present study.

Construction sector has shown a massive expansion, followed by contractions from time to time, suggesting that this sector is highly volatile, especially in core areas. There are new laws such as consumer protection law, real estate (regulation and development) bills 2013etc. which give the consumers the right to claim compensation in case builders do not handover constructions within the specified time of the contract. Therefore there is a reason why construction agencies would like to build and sell their constructions as soon

as they can. Due to time constrain and high volatility in the core area constructions generally high valued construction agencies are preparing the alternative bricks to traditional bricks since they are standardized in terms of quality, suffer lesser risks with reference to supply side hold up problems because of the nature of inputs unlike mud and clay do not depend on limited availability or other uncertainties and further, the alternative bricks are very useful for quick constructions. The alternative bricks are also lighter in weight and permit different shapes and therefore are preferred by architects especially in (vertical) high-rise and high valued constructions. Moreover, traditional brick kiln industries have been producing bricks by small scaled, traditional labour intensive, unskilled, production system which cannot easily be scaled up. Multiple-suppliers for a single project could have several other coordination problems.

In the backdrop of these volatilities, uncertainty and regulations, the conditions are further complicated for brick kiln production by the mode in which urbanization has expanded, which has remained restricted to core urban areas. The peripheries have remained neglected with reference to physical, social infrastructural investments. At this juncture the middle classes that cannot afford to buy in core areas are thus compelled to pay high rents for houses in core areas rather than prefer houses located in poorly equipped peripheries. This has generated significant price differentials between core urban rentals and periphery rents. The peripheries have thus become low valued constructions and core areas have become high valued constructions.

In the backdrop of this scenario the dynamics of the brick kiln industry need to be analyzed and understood; in this scenario different actors face different levels of uncertainties, and types of risks within brick kiln industry etc. For example in Attapur Adda, the main agents are suppliers and dealers. The suppliers generally directly depend on the brick kilns for consignment but are not the final consumers and the price which is paid by the suppliers to brick kiln owners is not uniform but differ among suppliers, the price and bargaining power depends not only on demand but also on the long term

relations of trust with owners of brick kilns. Another important actor in the market is dealer, having a permanent shop to sell bricks purchased from adda. In case of poor demand the dealer can stock and wait until market conditions change. The suppliers do not have any long term relations with any category of customers and are very vulnerable to business cycle risk, but under expansionary market conditions they benefit because construction sector is compelled to take risks for lack of adequate supplies. However, during the downward business cycle the suppliers are hit very badly as it reduces construction activity and customers. They also have high inventory risk for they do not have go-downs to store the inventory and are not residents of the city, therefore it forces them to selloff their product as quickly as possible at spot price. In addition to this inventory risk; risk of rejection of product based on crude indicators, the suppliers sell their product to different consumer as an unknown seller, hence choosing good quality of brick is costumer's duty, once the product is delivered to the costumer the task of the supplier is over. Here the supplier is not responsible for lower quality; the whole risk will be borne by the buyer. But in case of the dealers in the adda they maintain long term relation with costumers, they need to ensure and provide good quality to their customers. The dealers in Adda tend to have more reputation risk since he has to deal with the different kinds of construction material such as concrete stone, cement bricks, hollow bricks, sand, etc. above all, the loss of reputation of in case of one product affects demand for other goods too. In case of the construction agencies and brick kiln industries also, there are uncertain relations, particularly the construction agencies which are using the mud and clay bricks, have been maintaining informal relations with the brick kilns, these are unwritten contracts and do not ensure fixed price or on time payment.

Because of the volatilities, uncertainties and also constraints on quality and assured supply catering the requirements of elite classes; the high valued constructions are moving away from traditional bricks to alternatives. There are clearly several advantages with reference to use of alternatives such as standardization, high quality, durability, on time delivery, capable of supply to entire project since these are mechanized mass

production systems, organized and capital intensive based production system with formal contracts and long term interests.

Big companies' interest in moving into traditional bricks is limited because of uncertainty and hold-up problems associated with supply side bottlenecks; such as different types of mud quality in land, which is taken for production of brick, inadequate and unsure supply of inputs in coming years, changing farmers' preferences and changing land pattern for example, especially Telangana government, has taken up what it calls the mission Kakatiya under which there is a plan to revive village lakes and provide for development of minor irrigation. If such investments actually are made, the brick producers may soon have no area to source their raw materials from.[52]The capacity to diversify the traditional brick kiln into the alternative brick production is very limited since they have limited capital to invest, unskilled and labour intensive based production system. These restricted them to remain as suppliers of low valued construction project at peripherals.

Small companies' capacity to diversify into alternatives is much limited. Like the traditional brick kiln industries, these agencies are generally resource and technology constrained. The capital to invest and transformation of technologies are low therefore small construction companies' capacity to out beat high valued construction agencies is limited. Small producers are therefore left with low valued constructions, and engaged in cost cutting strategies such low pay to workers, sweatshop conditions with almost 16 hours of working day, violation of environmental and several other laws.

The sustainability of traditional brick kiln industry therefore depends on the expansion of low valued construction and public good constructions which are the main sources of demand and which are happening in green field sites. The factors that led to expansion of demand for houses in green field sites include the employment in informal sector for migrants. The future of the brick kiln industry has come to depend on the expansion of

[52]A Survey of Migration from Western Orissa to Telangana 2015 pg no: 76

the manufacturing and services in the green-field sites employing migrant workers in informal mode of employment who would then become tenants in the low valued constructions.

Thus this thesis has shown how the survival of the traditional brick kilns has not only got determined by the segmentation in the realty sector, nature of urbanization, competing production systems within the brick production industry but has got intricately interconnected with green field industrialization and the changing nature of labour relations therein.

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Annexure

Questionnaire on construction agency

1. Name of the supervisor and name of the construction agency he works for?
2. Education qualification of the supervisor?
3. Native place of the supervisor?
4. What is the value of the total construction project?
5. What is the total constructed area of the project?
6. What is the total plinth area?
7. What is the total quantity of bricks required for the construction?
8. From which brick kiln your construction agency purchases bricks?
9. On what basis the construction agency decides on which brick kiln to buy from?
10. What are the sources of information about the brick kiln?
11. Do you usually prefer to source bricks from single seller or do you choose to source your bricks from multiple kilns? What are your reasons?
12. Each time you purchase bricks do your representative visits several brick kilns or does the construction agency go back to the same brick kilns each time?
13. Is the choice of brick kilns done on the basis of long term relation, familiarity and trust or is it purely on the basis of price and quality?

14. Do you (the construction agency) place a demand for the bricks you require with the brick kilns well in advance or do you (the construction agency) make spot purchases of whatever bricks are already made by a kiln?

15. If you (the construction agency) place your demand well in advance, what are the usual time lines like (1, 3, 6, 12 months? Or any other?).

16. Does the construction agency give deadlines to brick kilns before which they must supply?

17. Do brick kilns always meet the time lines?

18. In the event of a brick kiln failing to meet the time line you give, are there any sanctions you impose on such brick kilns?

19. Do you or your representatives keep going to the kilns to ensure that your demand is being met by the brick kiln?

20. With how many kilns do you currently have contract with?

21. What is the Quantum of the bricks you purchase per square feet?

22. What is the estimated cost of the construction site? What is the percentage of the bricks in total cost?

23. How do you (the construction agency) assess quality of bricks (indicators)?How much does quality of bricks matter?

24. Does the condition of work in the brick kilns ever concern the firm carrying out the construction project?

25. What methods do the construction adopts to ensure quality control by brick kilns?

26. If the construction agency is not happy with the quality of the bricks supplied, what will happen? – can construction agency return the consignment or do you (construction agency) bear the costs or do return it supplier?

27. What is the nature of your contract with the brick kilns? (Does it involve credit purchases or does it pay advance amounts or on site payment and purchase or payment in installments)?

28. Are payments ever deferred across seasons?

29. How is the price of the bricks determined? (Is there a given market price or do you bargain and fix the price every season?)

30. Do you think brick kilns act as guilds to artificially inflate prices of bricks or do you think they are too weak economically to do this?

31. What does the price of bricks depend on (quality, volumes, time, long term familiarity and relationship)?

32. Whose responsibility is it to transport the bricks? Who bears the transport costs?

33. Does the price of the brick include the transport cost within or it charges separately by brick kiln owners?

34. If the bricks get damaged during transportation who will be liable for it?

35. Does the construction agency give any incentives to the owner of the brick kiln to improve the quality of the product?