Editorial

Nine papers make this issue of the ITPI Journal. The first paper titled 'Reclaiming Socially Inclusive Streets' is written by Ankita Singh, Nidhi Nayyar and Amitesh Vijay Mourya. They see that streets have acted as a need as well as an integral part of a neighborhood since the time of early civilization. Streets have acted as hubs for interactions, socializing, playing and providing a sense of culture to the communities. Urban streets have gone through a lot of changes since they were first laid in terms of use in short period of three decades. The social usability of streets has been lost due to various factors. This paper tries to track down and analyze these changes in street use and discusses ways to improve their usability and condition.

The second paper titled 'Intra-Urban Migration and its Impact on Significance of a City: A Case Study of Sawantawadi' is written by Shaila Bantanur, Jainam H. K. and Ashwathi S. N. In this age of rapid globalization, everything is fast paced including urbanization due to which the economy is also booming at a much greater speed than anticipated. People are trying constantly to keep up with this pace and hence are moving from rural to urban areas, overcrowding the urban areas and affecting culture, since technology has taken over us. Humans are so driven by this that we have lost connections and adopting modernity in order to simplify our lifestyles. Contemplating this aspect the very population in rural areas is declining and is affecting the identity. Semi urban spaces are developing to accommodate the growing population. In this respect, the present paper examines Sawantawadi, a city in the Sindhudurg district of Maharashtra.

A. K. Jain has written the third paper titled 'Urbanization and Social Transformations'. He shows that Government of India has launched new missions like Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Pradhan Mantri Awas Yojana, Historic City Development Augmentation Yojana (HRIDAY) and Swachh Bharat Mission (SBM). These missions are focused on the provision of core infrastructure services like water supply, sanitation and solid waste management, efficient urban transport, affordable housing for the poor, round the clock power supply, IT connectivity and e-governance. These missions have opened up new doors for participatory planning for enhancing diversity, livelihoods, connectivity and provide better education, healthcare, urban safety and services. Paper argues that success of this new ways of planning and urban governance needs local planning, legal, institutional and regulatory reforms.

'Deciphering the 'City', a methodological exercise' is penned by Gauri Kopardekar. A lot of international and national literature on cities reveals application of newer methods. Major Indian cities have been covered by different researchers but mainly through a case study approach. Ethnographic studies also dominate the literature on cities. Coffee-table books have been a popular literature tracing the development of such cities from their ancient past to modern existence. Some serious attempts have been made to plot the evolution of a city from policy angle and through a lens of economic development. This paper makes an attempt to study literature by researching different cities world over and from India in order to find out new trends of studying socio-political-economic aspects of a city.

In the fifth paper, Ramakrishna Nallathiga focuses on financial aspects in relation to urban development through his paper titled 'Resource Mobilisation for Urban Development in India: Some Options and Experiences'. Development of cities primarily constitutes development of land and housing as well as provision of community infrastructure services both physical and socioeconomic for urban population. Creation of urban development infrastructure i.e. land, shelter and civic services would require dispensing a large amount of resources by urban local governments. Addition of other functions viz., urban poverty alleviation, urban transport, urban forestry and animal welfare, has further compounded the resource needs. Therefore,

Urban Local Bodies (ULBs) need to mobilise resources for meeting the pressures of urban development outside traditional framework, which is analyzed in this paper. Apart from reforming and strengthening conventional resources, it is suggested in this paper that ULBs have to exploit the potential of non-conventional means of resource mobilisation.

Mayarani Praharaj focuses on 'Management of Groundwater in Coastal Odisha: A Study of Balasore District'. Increased level of urbanization coupled with inadequate provision of water supplies for people have contributed to the depletion of ground water in and around large cities. Besides, erratic and scarce rainfall contributes to the quantitative and qualitative deterioration of ground water in a number of cities in India. Groundwater sources in Odisha are depleting in different parts of the state as anthropogenic groundwater withdrawals exceed natural recharge. CGWB reported that GWT is depleting rapidly in 24 out of 30 districts in Odisha. Aquifers in many areas of Odisha are under stress and gradually drying up. Salinity, ground water extraction and contamination and water logging in different parts of the coastal region need a planned development of the coastal aquifers.

The seventh paper by Meesha Tandon is titled 'Action Planning for Water Resource Management: A Case study of Rajasthan Cities'.Climate adaptation necessitates measures towards water resource management, especially in countries like India where water stress is likely to increase with impacts of climate change. In view of this, a strategy for consultative action planning for urban water resource management is developed and tested in 4 Indian cities. Action plans for water resource management are formulated in consultation with the stakeholders and multi stakeholder platforms are constituted. This concept promotes perception of urban water cycle as a loop with water, wastewater, storm water (and interactions of these elements with solid waste) forming part of the same cycle while aiming at a circular economy. A six-stage process is adopted for the formulation of water-based action plans for cities. In this paper, the strategy adopted for the formulation of water based action plans for two cities in Rajasthan i.e. Kishangarh and Jaisalmer, are also discussed.

Yajush G. Sonar and Chetan R. Patel write on 'System of Land Records and Land Titling in India'. They show that the Indian records system dealing with land is unique and too complicated following its historic legacy. Unsophisticated data sets of land records is the result of colonial legacy, which was only meant to ruin nation's social, cultural and economic stability and was meant to favour the colonial regime. They argue that now it is our responsibility to regain our glory by making indigenous laws that will suit Indian conditions, especially with land titling. Today, multiple agencies dealing with land records confuse users. Many shortcomings of the present system are analyzed through exhaustive literature search in order to understand this system in a comprehensive way. A new approach to deal with this situation is proposed.

'Strategy of Inclusive Growth in the Independence Era: A Case of Model Education Town' by Vibha Gajjar and Foram Bhavsar is the last paper. This paper is a narration of a progressive development of model education town of Vallabh Vidyanagar in Gujarat during the independence era. Structural changes in social, political and economic order demanded an innovative model of inclusive growth of rural centres to reduce migration from rural to urban areas. This paper reviews the vision and strategies formulated and implemented by the visionary leaders of 1950s for land management and establishment of an education town. It describes the factors responsible for inclusive growth of the entire Anand region due to multidimensional impact of Vallabh Vidyanagar. It tries to decode various implemented approaches significant in building the town from planning, economic and social development in sync with political and social intentions. Beside various components of the master plan are also discussed with an analytical framework of neighborhood planning.

Ashok Kumar, Ph.D.
Editor

Content

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Reclaiming Socially Inclusive Streets

Ankita Singh, Nidhi Nayyar and Amitesh Vijay Mourya

Abstract

Streets have acted as a need as well as an integral part of the neighborhood since the time of early civilization. These have acted as a hub for interactions, socializing, playing and providing a sense of culture to the community. Urban streets have gone through a lot of changes though since the first streets were laid in terms of use in short period of three decades. The social usability of streets has been lost due to various factors. This paper tries to track down and analyze these changes in street use and discusses ways to improve their usability and condition.

1. INTRODUCTION

Louis I. Kahn in The Street makes a telling comment about the street. “In a city the street must be supreme. It is the first institution of the city. The street is a room by agreement- a community room- the walls of which belong to the donors, dedicated to the city for common use. Its ceiling is the sky. Today, streets are disinterested movements not at all belonging to the houses that front them. So you have no streets. You have roads, but you have no streets”.

Streets as part of public space can be defined as restricted and appreciated resources dedicated for the public use. The use and representation of urban streets today reveal the array of uses, users and their understanding of governing the resource. If we see urban streets in a long-term perspective, streets have always been used simultaneously by diverse moving users (pedestrians, horse-carts, bicycles, and now cars) as well as by static or non-moving actions.

A little over 4,000 years ago the first streets were laid out in India in ancient cities of Harappa and Mohenjo-Daro of the Indus valley civilization (Fig. 1 and 2). The streets served basic need of movement from one place to another and also connected people to roads for longer travels. These brick laid streets were orthogonal with proper drainage and sanitation and were wide enough for wheeled carts to pass through, which gave better trade options.

The streets in the rural areas of India before independence were still used primarily for the pedestrian movement and socialization. Either the streets

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Fig. 1: Harappan Street

Fig. 2: Harappan Streets with Drainage and Sanitation System in Place

Source: Harappa.com

were earthen or laid with bricks. The modes of the movement were generally on foot, horse, animal driven carts, cycle or rarely motor cycle. The slow moving vehicles posed no threat to the pedestrians on the street involved in various activities. The people used the street for other purposes other than walking too, such as having an informal chat with the neighbors while crossing their house, using the front of the house for various activities ranging from drying spices to hold functions and rituals, the hawkers whether carrying his stuff on his head or pushing his cart will roam in the streets, children will run the streets in joyful mood with their friends, etc.

With the transformation of the era, society and most importantly modes of transportation the changes in the planning and use of streets became visible. As slowly we advanced towards twentieth century the important changes happened.

1.1 Urban Streets

In Indian cities, urbanization has been growing at a rapid rate for the last few decades. Towns and cities have expanded rapidly as growing numbers of migrants from the rural areas, come in search of opportunities for livelihood and raise their standard of living. The increasing demand for both mobility and real estate has also disturbed the condition on streets and in the public spaces. Also today, in the everyday experience, it can be seen that the urban streets contain various activities that go beyond transport purposes. These activities characterize a significant part of urban life transforming the streets into a stage for a promenade, a playground for children, street cafés, shelters for the homeless, commercial places for street vendors or hawkers, etc.

The streets also add to the open spaces around the house for much needed natural air and light and also turn into the recreational spaces for quick walk or for a short game for kids. The social bonding between neighbors and people were enhanced by the chitchat on the sides of the streets. They started becoming infrastructural backbone that supported day to day activities, economic growth

of a town; the very development of a city depended on its streets. They soon became lifelines of our community and foundation of our economy. They are now an integral part of the infrastructure as they carry the potential to foster business and our daily transit and communication. With the invention of faster and longer modes of transport our streets also saw some changes, like streets started becoming wider and stronger to accommodate the growing needs of people.

Street traffic normally comprises of a wide range of vehicle types and, in addition, the streets are home to many other uses besides transportation. There are walking people, bullock carts, bicycles and hand-pulled rickshaws and cycle rickshaws. The motorization of households increasingly shapes the urban landscape.

Traditionally streets and public spaces in Indian cities have always facilitated a setting for large low-income classes to earn a livelihood and to satisfy their demand for basic necessities. Due to the accelerated urbanization process in recent decades and the subsequently increasing density in the inner city the mobility patterns of the urban middle-class have changed particularly. Rising incomes among the Indian middle and upper classes have made car/motorcycle even more affordable and accessible. The number of cars in a colony can go up to staggering three folds the number of families.

Most of the houses are not planned to accommodate more than one car or no car at all. This creates a situation where the owners park their cars on the streets making it narrower than it is. The parking of vehicles is the most wide spread practice nowadays. Then narrow streets are further chocked by the hawkers. The movement of other cars alongside parked vehicles makes it dangerous and uncomfortable for the pedestrians to walk.

As per the “chaotic” use of public spaces and streets in Indian cities, (Fig. 3 and 4) with an evolving dominance of motorbikes and cars, streets experienced an increased number of fatalities. However, this has not led to any safety actions on the government part. Neglecting the idea that walking is “by far the most important means for achieving urbanity in public spaces” (Rode 2013) the

Fig. 3: Present Day Condition of Streets in Indian Cities

Fig. 4: Chandni Chawk in 2011

requirements of pedestrians are not predominantly recognized as part of urban transport infrastructure. In consequence, a large share of the population not only faces substantial difficulties for their daily routine works, but also experiences the neglect of liveable public spaces in the city. Due to the many efforts to build the infrastructure of the cities, like fly-overs, metro rails, etc., the concept of streets and public space have been completely shattered, encroached and marginalized. In fact, walking has been made even slower as pedestrians need to overcome huge barriers and difficulties on their way, e.g. foot-over-bridges, or a long way round.

Despite the important role streets continue to play in each of our lives and memories, today's streets are failing us on multiple scales. Our streets once functioned as multiple-use town centers, as places where children could play and where neighbors and strangers would stop for conversation, today they have become the primary and near-exclusive domain of cars.

2. HOW CARS INFLUENCED OUR STREET PLANNING

Rick Cole asserts that when we build our landscape around places to go, we lose places to be. Cars, a faster and most convenient means of travel; changed the culture and functional appearance of streets completely and came an era of urbanism. Streets were now governed by bye-laws rather than social or functional requirements, which standardized urban street planning with defined widths, infrastructure and some patches of green. Street widths needed to be increased to accommodate more and more cars, so the planners trimmed the plinth ramps and gardens of people's residence. The place which originally was designed to facilitate public interaction is now mere a place where fast moving cars commute.

Because of the momentum of cars, mothers were always petrified for their children's safety, who used to play or simply take a stroll on streets. To satisfy this, the planners introduced neighborhood parks, which were a relief to everyone, now children could play safely, old people could walk safely and people could interact with each other without the danger of being hit by a car. Everyone thought it to be a good solution.

2.1 Social Spaces

Social spaces are basically for gatherings and interactions among individuals of all class and age groups for social and community purposes. Street life once used to be an integral part of the social life of people, all around the world. Friends met and hung out on the street, children played there, neighbors caught up with each other, and people watched people. But over the years, the kind of vibrant street life we had has been greatly reduced, mainly due to the increase in vehicular traffic on the street and reducing street sizes for pedestrians. Donald Appleyard's

seminal study "Liveable Streets" (1982) showed that social connections between people on a street were inversely proportionate to the amount of traffic. In addition there is a perception that social activities on the streets might block traffic or increase crime. There are also concerns that there will not be adequate maintenance of the spaces and an increase in liability for the city.

Allan Jacobs said it well in his book "Great Streets" (1995), "First and foremost, a great street should help make a community: should facilitate people acting and interacting to achieve in concert what they might achieve alone. Accordingly, streets that are accessible to all, easy to find and easy to get to, would be better than those that are not. The best streets will be those where it is possible to see other people and to meet them; all kinds of people, not just of one class or color or age. "The best streets encourage participation. People stop to talk or may be they sit and watch, as passive participants, taking in what the street has to offer."

The need of an hour is to design the streets for social gatherings and to put people before cars and address other apprehensions that are creating barriers to bringing the street life back.

A well designed social street space is a great outdoor living room that is welcoming of people of all genders, race, ethnicity, age and socio-economic levels. The street has become the place to meet old friends, make new ones. Creating and designing streets that convey a sense of belongingness and inclusion encourages social inter relation and discourage separation.

Street design is an opportunity which should be used to create vibrant spaces where people of all age groups want to spend their time. Social streets should accommodate a variety of people and abilities (singles, couples, families, people with disabilities, elders, pet owners, etc.) and in varying locations (sun/shade and exposed or protected). It is also crucial to provide the infrastructure and framework for varied and ever-changing activities and events in these spaces. The social function of streets can be analyzed in terms of following aspects:

- **Who owns, uses and controls it?:** There could be various situations, first, when the owner and user of the street is the same person/group and the streets are in control of those same person/group. The rules and regulations can be determined by the consensus and applied in the benefit of the residents effectively. This encourages the sense of ownership among the users and the maintenance becomes the individual responsibility. Secondly, if the owner and controller of the streets is some authority and the users are the residents of the area then the control of the street is governed by the bye-laws enacted and imposed by the authority. In this scenario the ownership by the users is reduced to minimal.

- **The purpose for which it was built:** Every neighborhood that is planned the streets are laid according to the predefined uses. When the use of the street is for pedestrian walking they are laid with short lengths, kept narrow, with provision of shades and sitting, etc., the concerned user will take a while to cover the distance and may stop by to take rest or to socialize with the other passer-by. While the streets designed for motor vehicles tend to be broad, long, shade not a concern, etc., as the user is not expected to stop or take long time to cover the distance.
- **Changes in social and economic function:** Since the motor-age, planning of cities is biased towards creating the unhindered movement for the vehicles. The pedestrian movement is the biggest hindrance in this regard. Since the pedestrians do need a place for recreation and socializing with the other beings, they tend to use the streets for this purpose and hence the conflict occurs. To curb this conflict the neighborhood concept was developed. In which the city was divided into small neighborhoods defined by major road at the periphery and leading the vehicles right to the doorstep. The parks (Fig. 5) and green spaces were created behind the houses in order to avoid people coming to the roads on foot. This is known as Radburn neighborhood concept.

  Fig. 5: Neighborhood Park

  

  This concept is followed in modern city planning worldwide. Where the houses are planned abutting to the road so as to facilitate doorstep access via car. The chunk of green area is provided as per the available land and convenience. This concept is an example of planning for the cars instead of the people. Alternatives solutions of the street planning followed in different cities world over.

  Urban design and planning is one solution to a multi-dimensional problem. Local governments in many cities have started providing incentives to attract the private sector in re-branding the urban core. Public-private partnerships (PPP modal) seems to be the approach that governments is taking and are quite successful in bringing different age group people alike to use these social places. However, there is a limit to over dependence on the private sector. But these negative effects that are there can be mitigated if local officials are made conscious of alternative solutions.
- **Pedestrian Friendly Planning:** Pedestrianization is an urban design strategy that concerns transforming a street to a public space that is pedestrian-

Fig. 6: Streets with Pedestrain Walkways allows for Smoother Vehicular Traffic and Safe Walking

Fig. 7: Streets with no Pedestrian Walkways, People Walk in Carriageway

Source: Better streets, better cities A guide to street design in urban India by ITDP, 2011

friendly rather than motor-vehicle controlled. We have several cities, for example the New York City has pedestrianized Times Square and reconfigured further popular streets to increase pedestrian islands, widen the sidewalks and creation of more outdoor eating spaces. Several cases can be found around the world which establishes the benefits of re-functioning streets as pedestrian walkways, open spaces, and market places, etc.

- Restriction on the ownership of cars (Singapore);
- Planning of pedestrian dedicated streets (Rome);
- In existing areas planning of one-way streets (with parallel parking) (Greece);
- Speed limiting in the residential area and check on the violators; and
- Awareness and capacity building among the society.

It is noticed that walkable cities offer more than just charm and convenience they tend to be safer and their residents tend to be healthier. The best examples of walkable cities other than already mentioned we have today are Copenhagen in Denmark, Vancouver in Canada, Florence in Italy, etc.

- **Reshaping the Public Transportation System:** One of the first and foremost step in reducing the vehicular pressure in the cities is to conduct a city-wide spatial planning analysis. The purpose of this study should be to evaluate the current traffic flows and to measure and quantify patterns that choke the city. Such assessment will shed light on the gravity of the problem and local officials will then only be able to make complex transportation related decisions with long-term impacts affecting the city. The study have

Fig. 8: Street Vending at Designated Spaces, Ahmedabad

Fig. 9: A Formal Street Vending, Select City Walk Mall, Delhi

the holistic approach with last point service in mind and simultaneously integrating non-motorized vehicles as part of the transportation system in the residential area to avoid motorized (public or private) vehicular movement.

- **Space for Street Vending:** Street vending offers easy access to economical goods and services for a varied range of income groups, especially the poor in Indian cities. In India, street vendors constitute 2.5 percent of the urban population. Assuming a household size of five and multiple income sources, over 10 percent of urban households likely depend on street vending. Hence, it is important to provide enhanced and more formal street vending spaces. Well located and connected street vending reduces the trip lengths by letting people shop and buy stuff on the way to other destinations. Formalizing street vending may be seen as a means of poverty alleviation—from point of view both of the vendor and of clients unable to afford more expensive goods and services in formal establishments. Few examples of cities with pedestrian friendly streets are:
- **London:** Walking is a popular recreational activity in London, (Fig. 10) despite traffic congestion. Town centres and high streets have buildings and roads, but the spaces in between are what hold them together as a place in this city – the open spaces, streets, squares, green spaces and the network of pavements and pedestrian thoroughfares that knit them together. All too often, these spaces are used as no more than that – thoroughfares – and we start to forget that they can be so much more.

  Walking supports local shops and businesses of the city.

  - Walking is the second most popular way for Londoners to roam around, after taking the bus. It's more popular than the car, train or tube
  - Pedestrians are the most frequent visitors to town centres each month. So not only do they spend more money per trip, they visit more often too

Fig. 10: Streets in London City

Government research shows that making town centres better for walking can boost trading by up to 40%

London's annual West End Very Important Pedestrian (VIP) Day in December, when Oxford and Regent Streets close to traffic, increases footfall by up to 40%. Some stores achieve their best sales figures of the year.

Fig. 11: La Rambla

Source: www.citylab.com, Photo by Brent Toderian

Fig. 12: Biker in Barcelona

Source: http://www.citylab.com/design/ 2012/11/6-ideas-every-city-should-steal-barcelona/3998/

Fig. 13: Octagonal Block Street Barcelona

Fig. 14: A Pedestrian-friendly Street in Gràcia Neighborhood

Barcelona: The wide avenues and boulevards of Cerda's Plan give ample room for multi-modal infrastructure. Walking has long been a priority - as illustrated by five centuries of "rambling" on La Rambla, one of the best people streets in

Fig. 15, 16,17,18: Streets of Europe (Paris, Switzerland, Zurich)

the world. Cerda's expansion plan made walking enjoyable almost everywhere - 50 percent of all street space is dedicated to walking space, with the other 50 percent for all other forms of 'traffic. Barcelona is one of those cities where one can have many choices as to how to get around, the place and the urban form facilitates these choices. Because of the densities and mixed use development, walking, biking and transit are always viable options. The "power of nearness" with everything compact and close, facilitates a multi-modal city. Public spaces in the city are like the areas where one can exercise citizen rights: exchange, expression and participation, culture and knowledge, the right to leisure being implemented by its residents.

Other European Cities: Most of the Europe is best explored on foot. It has varied charming walkways which follows the topography and respects the contours well. It incorporates the vehicular parking, moving vehicles, trams, moving vehicles, pedestrians, cafés and informal markets in a very sustainable fashion. Everything co-exist together without posing any threat to the other, it feels like a community. Here people talk, walk and eat; they are a good example of socially inclusive streets. In Paris, some of the streets gets closed by automatic barriers in evening and become pedestrian only zones for public interaction and small cafés pop up making them safe and interactive.

3. CONCLUSIONS

Streets as part of the public sphere are used in a multidimensional fashion reflecting the system of society. A great street should help make a community, it should facilitate people acting and interacting with each other and it should be accessible to all, easy to find and easy to get to, and wherever it is possible to see other people and to meet them. Street conjoins all kinds of people, not just of certain class or color or age. As Allan Jacobs in the Great Streets (1995) underscores: "The best streets encourage participation. People stop to talk or maybe they sit and watch, as passive participants, taking in what the street has to offer". Along with great streets one needs formal rules and their enforcement in order to empower and protect pedestrians and street hawkers and give them equal rights. Although, India is following a western-style mobility path, it has not reached the mass motorization stage yet. This leads people to think about a similar trend from chaos (dynamic overlapping of the spatial layers) to order (spatially segregated slices) in the everyday use of urban streets, once motorization reaches a critical mass. Although appealing, this approach seems to be a copy and paste interpretation, which gives a dominating role to a single user group i.e. motor vehicles in this case, estimating other elements as ancillary or marginal (Offner, 1993).

Indian cities struggle to reconcile the competing needs of mobility and livability. As private motor vehicle ownership grows and governments attempt to accommodate the additional vehicles, it is becoming more and more difficult to retain adequate space for the social and economic activities that traditionally have taken place on our streets. Over time, streets have come to function less as social gathering spaces and market areas, and more as conduits for an ever increasing volume of traffic. Enforcement will be necessary to ensure that parking does not encroach on footpaths or cycle tracks. Sure way to sustain optimal utilization levels is to charge appropriate parking rates based on the demand of the place. It is also important to recognize the variety of activities that keeps happening in the public realm by allocating dedicated spaces for street vending and by providing street furniture to complement vending activities and to give people a place to sit, relax, interact, and enjoy. The key component of a people-oriented vision is to provide higher quality spaces for walking. Pedestrian first approach is required in street planning for better urban streets today. In the Urban Street Design Guide published by Island Press, an important aspect of a street is noted: "Streets are the lifeblood of our communities and the foundation of our urban economies. They make up more than 80 percent of all public space in cities and have the potential to foster business activity, serve as a front yard for residents, and provide a safe place for people to get around, whether on foot, bicycle, car, or transit. The vitality of urban life demands a design approach sensitive to the multi-faceted role streets play in our cities".

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Intra-Urban Migration and its Impact on Significance of a City: A Case Study of Sawantawadi

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Abstract

In this age of rapid globalization, everything is fast paced including urbanization due to which the economy is also booming at a much larger scale than anticipated. People are trying constantly to keep up with this pace and hence are moving from rural to urban areas, overcrowding the urban areas and affecting culture, since technology has taken over us. Humans are so driven by this that we have lost connections and adopting modernity in order to simplify our lifestyles. Contemplating this aspect the very population in rural areas is declining and is affecting the identity. Semi urban spaces are developing to accommodate the growing population. This paper highlights the case study of Sawantawadi, a city in the Sindhudurg district of Maharashtra.

1. INTRODUCTION

Sawantawadi is a *taluka* in the Sindhudurg district of Maharashtra. The town is geographically placed with the Sahyadri Range towards the east and low lying coastal areas towards the west. Until the 1850s, Sawantawadi was known as Sunderwadi. The name came into usage because of surname of the state's former ruling family, the Khem Sawants. Sawantawadi is famous for its wooden toys and crafts, bamboo crafts, pottery art and Ganjifa cards. It was established by the oldest ruling family in the Konkan, the Sawant Bhosales in the late seventeenth century. The kingdom was established in the year 1627 by Khem Sawant - I. Khem Sawant - II established Sawantawadi as the capital of the kingdom during pre-independence era, which was part of Charartha village.

Sawantawadi is renowned for its unique wooden toy making craft and has formed its identity because of it. In the recent times we see that there is a rapid decline in the socio - cultural context of the city due to modernization and urbanization. This paper, attempts to inspect these trends and what might happen if these trends continue. Its name represents Chitar community who settled in Sawantawadi in the 17th century after migrating from Karwada. The whole community is made up of artisans and craftsmen. It is said that they were influenced by wooden crafts in Pune and Telgu Brahmins visited this city influenced or brought with them the art of Ganjifa. Over the years other communities adopted this craft due to its success and settlement around the lane grew.

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Fig. 1: Ganjifa Cards

Fig: 2: Wooden Toys of Sawantawadi

Fig. 3: Comparative Land Use Map of Sawantawadi (1985 and 2010)

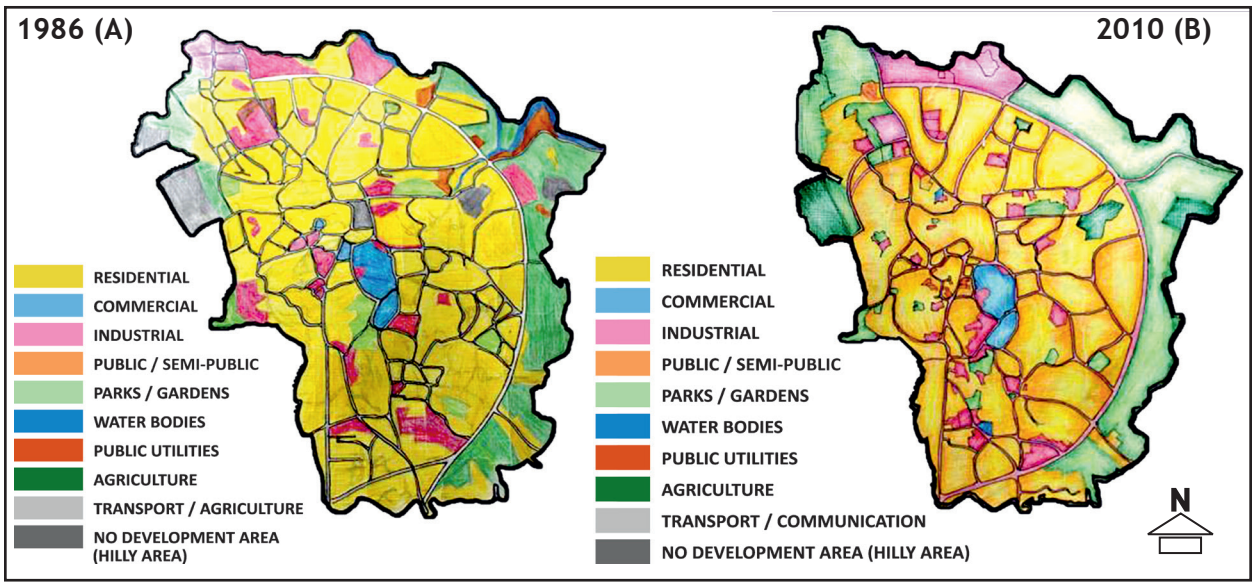


Fig: 4: Land Use Pattern in %

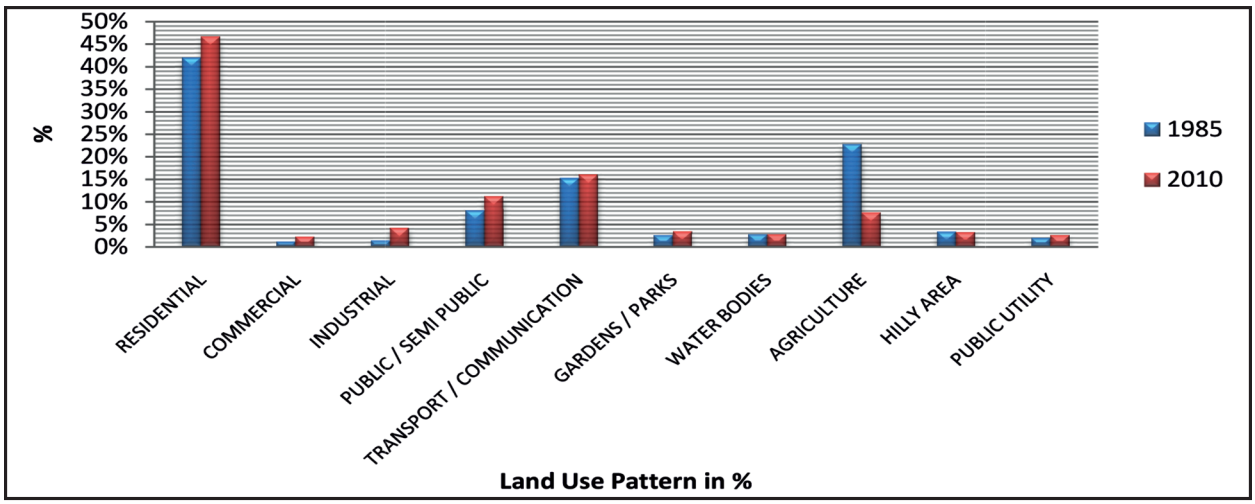
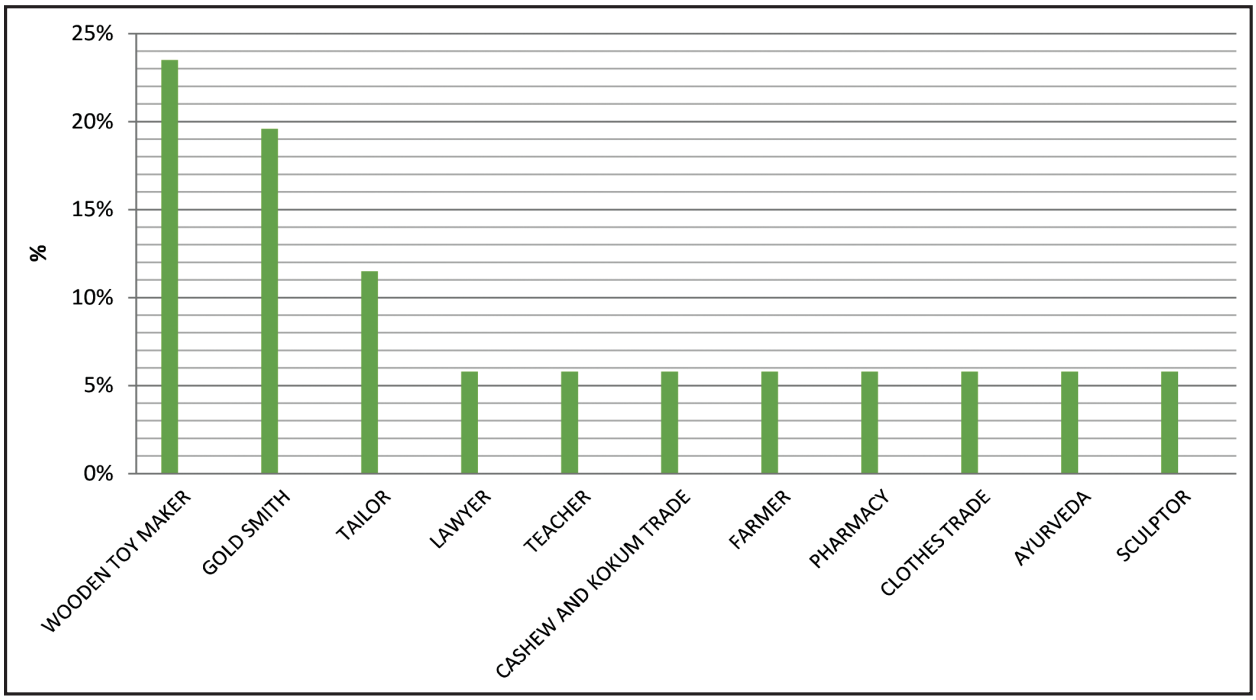


Fig. 5: Occupational Pattern of Sawantawadi



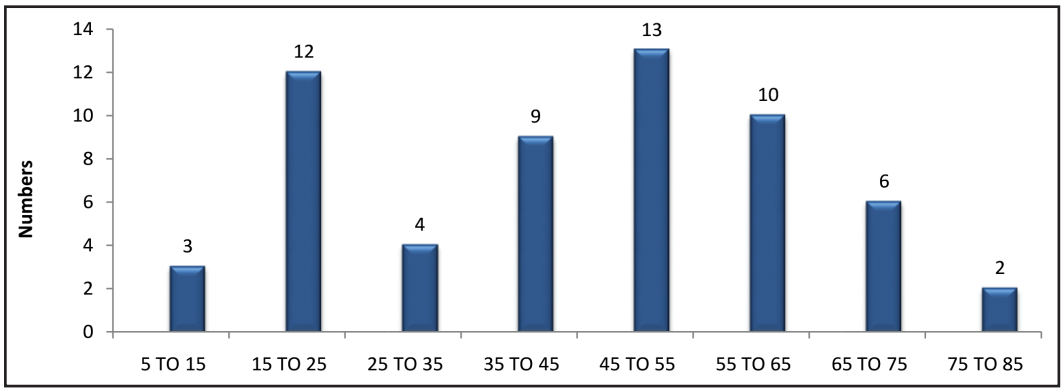
Ganjifa Cards are circular playing cards made from paper that is mixed with tamarind seed powder and coated with *lac*. A Sawantawadi Ganjifa is most popular for Dashavatar series. The main aim of these games is to teach and tell the stories from ancient scriptures and holy books. It is said that Telgu Brahmins passed on the art to the Chitaris, a class of artists in Sawantawadi. The Ganjifa card became popular in the royal courts and *durbars* as a past time (Fig. 1). Sawantawadi is well known for wooden lacquered toys and miniature utensils. The craft is traditionally carried out by Chitari and other communities have also adopted this due to commercial success. Toys are made from the *pangara* trees (Fig. 2). There has been a considerable change in the land use pattern in this town. As we observe, decline in agricultural land but residential zone have increased (Fig. 3 and 4).

2. SURVEY RESULTS

A survey was conducted in the existing settlement of the Chitar community and inferences were drawn by comparing the past and the present scenarios. Surveys include their present family structure, economic status, present line of work, etc. Research was also done based on the land use pattern changes and comparative study between them and drawing out the conclusions.

As per the survey, there are only 4 families continuing their ancestral business of toy making. The remaining families have deserted the business and started with newer occupations (Fig. 5). From the survey we conducted we understand that

Fig. 6: Number of People from Different Age Group (n=15)



most of the residents in the houses surveyed are in the age group of 45- 55. Discussing family structure with the residents revealed that the younger generation has migrated to urban spaces for better quality of lifestyle (Fig. 6). As per survey the number of joint families within the area are extremely less when compared to nuclear families which are high (Fig. 7).

Fig. 7: Family Structure (n=15)

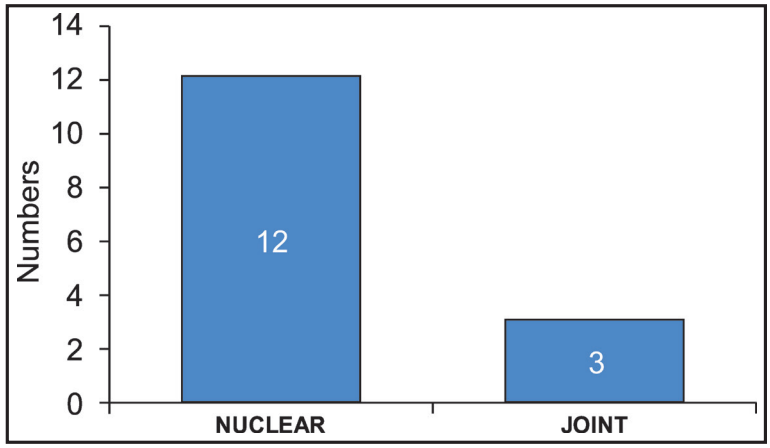


Fig. 8 clearly indicates that all the residents in the community have their own businesses and do not work under government or private sector. While Fig. 9 shows that less number of families has multiple occupations and most of the residents have a single occupation.

Fig. 8: Occupation Pattern (n=15)

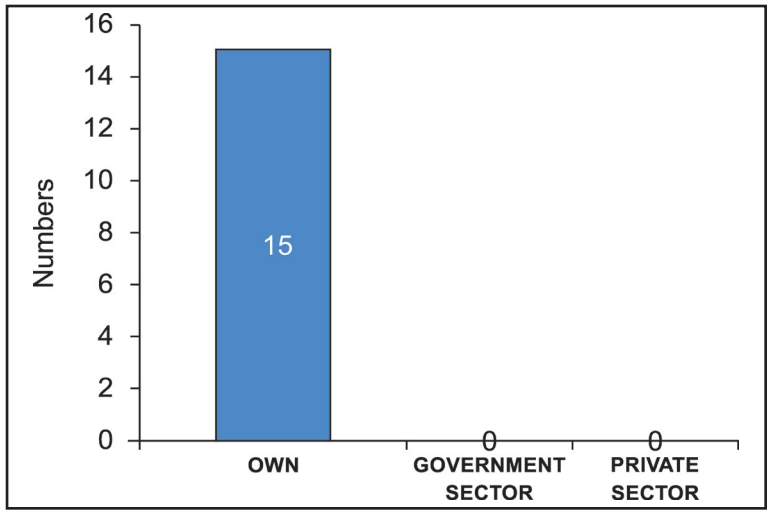


Fig. 10 represents the workplace of the residents. It is observed that the large number of people working within their homes can be observed. As modernization is taking a toll, therefore, the craft is declining rapidly and if the pattern continues, it will soon diminish. The business of these articles is also less

Fig. 9: Occupation Type

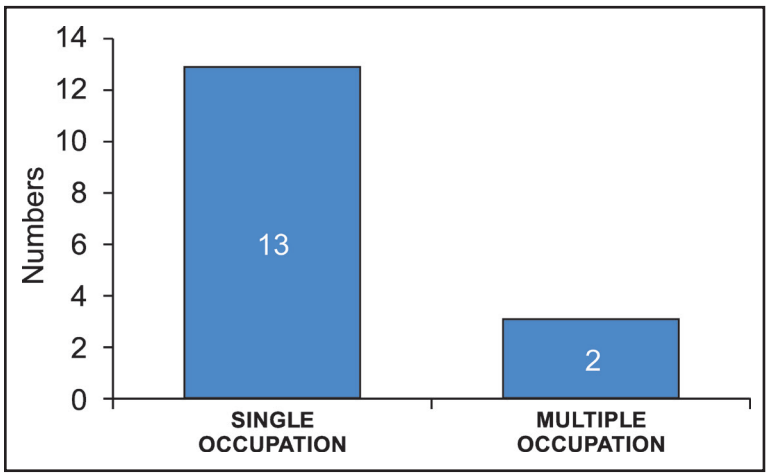
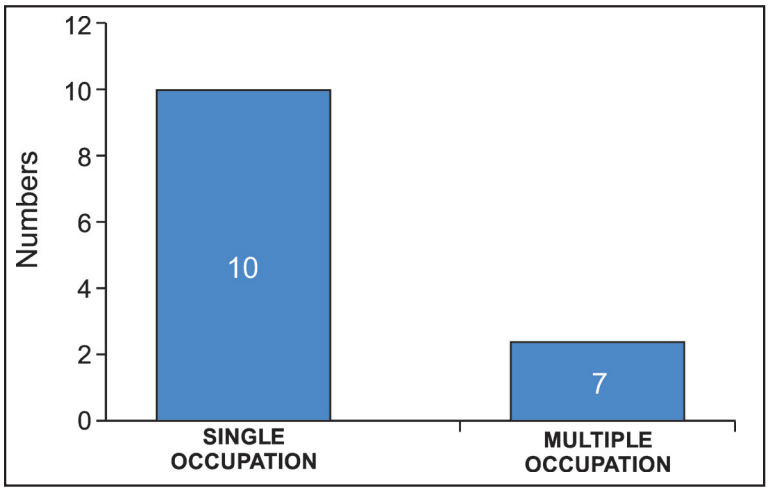


Fig. 10: Workplace of Occupation



and hence the community is opting and pursuing other businesses which have better outcomes. Only the older generation is continuing the businesses and that too on a very small scale. Through surveys conducted within the community of the artist's settlement, we noticed a pattern that leads us to this conclusion. Factors leading to the migration from rural to urban are desired for new and better lifestyle, job opportunities, education, etc. People are accepting modernity in their lifestyle and accommodating themselves to the new context. Migration at this pace is drastically altering the urban scenario and due to this overcrowding, it is a major problem in cities. Cities are unable to cope up with increasing population, which is over the estimated growth rate projection. This also results in the cities working inefficiently.

3. CONCLUSIONS

From the survey it was observed that there is a huge decline in the traditional arts of wooden toy making as an art and from a business perspective. This is partially due to migration of youth and better opportunities that cities offer. Younger generations do not want to continue their ancestral line of work and hence they migrate to cities for new lifestyles. The craft ends and ceases to exist after the older generations have gone. The art is now supported by the royal family of Sawantawadi in order to preserve the identity of the city. These arts are not supported and encouraged by the government and this too is one factor affecting migration. It is not just Chitar community of Sawantawadi, there are several other communities struggling to keep their arts and their identities alive in the present scenario. Some examples are Patachitra art of Raghurajpur in Odisha. If the current trend continues, the craftsmanship will soon be extinct with no one practicing the art of wooden toy making and Ganjifa cards.

Urbanization and Social Transformations

A. K. Jain

Abstract

Government of India has launched new missions like Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Pradhan Mantri Awas Yojana, Historic City Development Augmentation Yojana (HRIDAY) and Swachh Bharat Mission (SBM). These missions are focused on the provision of core infrastructure services like water supply, sanitation and solid waste management, efficient urban transport, affordable housing for the poor, round the clock power supply, IT connectivity and e-governance. These missions have opened up new doors for participatory planning for enhancing diversity, livelihoods, connectivity and provide better education, healthcare, urban safety and services. This paper argues that success of this new paradigm of planning and urban governance needs local planning, legal, institutional and regulatory reforms.

1. INTRODUCTION

India with more than 1,210 million people, 3.3 million sq km of area, 29 states, 7 union territories, 671 districts, 7,936 cities and towns, and 6,41,000 villages is the second largest populous country of the world. During the last few decades, urban scenario has been changing and a new narrative is unfolding. India's cities and towns having a population of 377 million, generate 60 per cent of GDP and 70 per cent of the jobs.

In India, the total number of towns and cities increased from 5,161 in 2001 to 7,935 in 2011. There are 475 Class I cities, each with a population above one lakh, and 53 million plus cities. The 53 million plus cities together constitute 42.63 per cent of the total urban population, while the 475 Class I cities together constitute 70.20 per cent of the total urban population. As per Census 2011, there are 3 mega-cities, viz. Greater Mumbai (18.4 million), Delhi (16.8 million) and Kolkata (14.1 million), which have crossed 10 million population thresholds while five cities, viz. Chennai, Bengaluru, Hyderabad, Ahmedabad and Pune have each attained more than 5 million population. It is projected that by the year 2031, about 600 million people will live in urban areas and 78 cities in India will become metropolitan cities i.e. million plus cities.

Millions of people every year flock from villages to cities in the hope of finding jobs and basic sustenance. However, many of them live in pathetic conditions in slums, lacking rudimentary services. Continuing poverty and unemployment, slums and squatter settlements, environmental pollution, shortages of housing

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Table 1: India's Urban Trajectory

Year	2011	2031
Population	1210 million	1440 million
Urban Population	377 million (31.16%)	600 million
Cities and Towns	7935	-
Million + Cities	53	78
Housing Shortage	18.78 Million Units	30.40 million Units
Slum Population	65.49 million	100 million

Source: Census of India, 2011 & McKinsey Report, 2010.

and basic services such as water, sanitation and electricity are common urban symptoms. Despite seven decades of planning and development, more people today are ill-housed than ever before. The urban poor are often caught in a cycle of perpetual poverty due to non-access to government programs, shelter, land, finance, employment and services. Children, elderly, women, disabled and the poor, including homeless and squatters constitute the most vulnerable group of people. Gender discrimination, lack of respect and sensitivity towards women, children, disabled and elderly are the common issues. Urban livelihoods are threatened by the risks of flooding, landslides, heat waves and droughts due to climate change. Deterioration of urban environment is a major problem faced by rapidly changing traditional cities. They are threatened by carbon emissions of use of fossil fuels, increasing traffic, insanitation, poor drainage, open defecation and by inadequate solid and liquid of waste disposal. Plans and development efforts usually fail since they do not integrate with cultural dimensions and social values. As per Ministry of Housing and Poverty Alleviation (MoHUPA, 2012), total housing shortage in urban India is 18.78 million units. On an average about one-fifth of the population, mainly poor, are living in slums, *bastis*, and *Jhuggi-jhompri* clusters.

Urban transport scenario in Indian cities is quite depressing. Vehicle population in India increased 80 folds in the last 40 years, but road area increased by only 5 per cent. Only 17 of the largest cities have organized bus services, and only six cities – Mumbai, Kolkata, Delhi, Hyderabad, Bangalore and Chennai, have an intra-urban rail system. In metropolitan cities, 40 to 50 percent people walk and use non-motorized transport, while 30 per cent people use public transport. Private vehicles are growing three to four times the population growth in urban areas leading to perennial traffic jams. It is estimated that 2.5 billion square meter of roads and 7,400 km of metro rail network are needed to be built by 2031. India with more than 140,000 road deaths and more than 500,000 major road accidents per year is one of the most unsafe countries to travel in the world. In Indian cities about one-third to two-thirds of trips are solely made by walk. Still 90 per cent of city roads do not have footpaths. Many roads have no signage, signboards, road markings and basic information for drivers and travellers. About half of urban roads have potholes and are in poor repair. By and large there is no system of road maintenance, which could

be held accountable. Intensive use of fossil fuels for urban transport (private vehicles, cars, two stroke engines, two wheelers, etc.) has made city air very unhealthy.

According to National Sample Survey Office (NSSO) data 69.3 per cent of rural and 18.6 per cent urban households do not have toilets. Over 2.6 million latrines are cleaned through manual scavenging and bulk of the human excrement enters into rivers, water bodies and drains. Large number of the public institutions, schools and workplaces are also without toilets. It is estimated that urban India generates 68.8 million tons of municipal solid waste per year, which is projected to grow to 160.5 million tons per year by the year 2041. Presently, only half of the municipal solid waste is collected, processed, treated or recycled. This is a major cause of insanitary conditions and poor hygiene, which pollutes the environment. It is estimated that out of 38,000 MLD of the municipal sewerage generated in India, only 12,000 MLD is treated. Wastewater and effluents from industries, dairies, refineries, quarrying, power generation, etc.; are major sources of air pollution, ground water quality deterioration and soil contamination. Cities account for three quarters of the total energy demand including fossil fuels, used for transport and produce almost 80 per cent of CO_2 emissions.

Almost every Indian city is situated along a river or water body, which is not only the source of water, but also has social, cultural and religious value. However, with indiscriminate pollution due to rising levels of urbanization, these rivers have become polluted and dirty. River Ganga was ranked among the top five most polluted rivers of the world in 2007. The form of urban planning and management prevalent in the country is generally bureaucratic and involves conservative controls. With the 74th Constitution Amendment Act 1992, urban local bodies were assigned greater role in urban planning and governance. However, this has not happened as most of the state governments are reluctant to part with their powers. Poor municipal capacity and finances are acting as barriers in the area of decentralization.

2. NEW INITIATIVES AND URBAN MISSIONS

In order to change the urban scenario and to make cities more livable, Government of India has launched new missions, viz. Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Pradhan Mantri Awas Yojana, Historic City Development Augmentation Yojana (HRIDAY) and Swachh Bharat Mission (SBM). The focus of these missions is on the provision of core infrastructure like water supply, sanitation and solid waste management, efficient urban transport, affordable housing for the poor, round the clock power supply, IT connectivity and e-governance. These missions

have brought India at the crossroads. These have also opened new doors of urban change, which aims to enhance diversity to enrich local culture, livelihoods, connectivity and better education, healthcare, urban safety and services, which are smart, inclusive and sustainable. This is an opportunity to change and indigenize urban planning and make it part of larger eco-system of sociology, which addresses our own demographics, culture, humanity, ecology, climate and local geography.

Ministry of Urban Development has already selected 99 cities and towns for development as smart cities based on the 'City Challenge' competition. These include 24 capital cities, 24 business and industrial centers; 18 cities of cultural and tourism importance; 5 port cities and 3 educational and healthcare hubs.

In terms of population, 8 cities have population up to one lakh. These are – Panaji (Goa), Diu, Silvassa (Dadra & Nagar Haveli), Kavaratti (Lakshadweep), Dharamshala (Himachal Pradesh), New Town (West Bengal), Pasighat (Arunachal Pradesh) and Namchi (Sikkim). 35 cities have population between one and five lakh; 21 cities are in the population range of five to ten lakh; 25 have population of above 10 lakh and below 25 lakh; 5 in the range of 25 to 50 lakh and 4 cities (Chennai, Greater Hyderabad, Ahmedabad and Greater Mumbai) have population above 50 lakh.

Smart Cities Mission envisages integration with other missions, particularly the AMRUT and Swachh Bharat Mission. It aims to harness the public, private and community resources and central government grants and funding. Capacity building and implementation focus are necessary to achieve results. Planning is a pre-requisite, which should be based on a comprehensive information system, digitized mapping and geo-portals. Planning of smart cities should relate with local culture and climate. It should be inclusive that provides jobs, livelihoods, local economic dynamism and a venue of cultural expression, learning and communication. Several smart city projects have been initiated in India, which include a network of smart cities on Delhi-Mumbai Industrial Corridor and GIFT city at Gandhinagar. Various state governments are preparing blueprints for the smart cities, Amravati, the new Capital for Andhra Pradesh, being the latest.

3. URBANIZATION AND LAND POLICY

Liberalization of the Indian economy in 1991 gave a new direction to urban and infrastructure development and the private sector entered in a big way in real estate, housing and infrastructure projects including ports and airports, rail freight corridors and Special Economic Zones (SEZs). According to the CAG report 2013, about 45,635 ha of land was notified for SEZs, of which 28,488 ha has been utilized,

while 17,147 ha of land is still unused. The emergence of transport corridors with a substantial increase in industrial investment, services, flow of goods and people along them has been a significant feature of spatial change in recent years. The Golden Quadrilateral network of national highways linking Delhi, Mumbai, Chennai and Kolkata as well as North-South and East-West Corridors, promote this type of growth. One of the recent initiatives is 1,483 kilometer long Delhi-Mumbai Industrial Corridor (DMIC) and 1,279 kilometer long Delhi-Kolkata (Eastern) Rail Freight Corridor. A separate corridor for freight trains would enable the Indian Railways to achieve higher speed, facilitate guaranteed transit time to customers, reduce unit cost of transportation and provide a competitive edge over the other modes of transport.

The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 has replaced the Land Acquisition Act 1894. It obliges the government and others to give rehabilitation package to displaced people, if they buy over 50 acre of land in urban areas and 100 acre in rural areas. Under the new Act land can be acquired by the government for its own use, or for the public purposes. Farmers will get four times the market price in rural areas, while in urban areas it will be double the market price. Acquisition of land under new land acquisition act is not only difficult, but also very expensive. There is no option but to adopt new ways of planning and development. The option should facilitate optimum use of land with rationalized FSI and densities. The brown field development has to be taken up in a big way rather than green development together with planned development of public services, urban transport, greens and social housing. Land pooling, town planning scheme, transferable development rights and accommodation reservation can be the alternative methods of land assembly for planned development.

According to various studies, land pooling model provides a viable alternative to compulsory land acquisition for urban development. This needs new capacity building of agencies dealing with urban development together with legal reforms and simplified procedures based on digitized revenue records. This also involves adopting scientific methods of valuation of land, circle rates and re-engineering of land development norms, and specifications and practices.

4. HOUSING AND SLUMS

India recorded a slum population of 65.49 million in 2011. A decadal comparison shows that India's slum population increased by 25 per cent during 2001-11. At the all-India level, one can say that about 17 per cent of India's total urban population lives in slums. Due to rising population, slum households, numbering 13.92 million in 2011 have grown by 37 per cent during 2001-11. Data further

shows that in the period 2001-11, while the share of slum population in India's total population has increased, its share in India's total urban population has come down.

India's urban housing shortage of 18.78 million units is confronted with the following major issues:

- Location vis-à-vis potential of jobs, economic growth, regional balance and housing demand;
- Policy supports and incentives for affordable housing;
- Land availability, along with the basic services, amenities and work places;
- Housing development, building technology and resources; and
- Financing: Low cost housing, land, services and access to finance.

For a more systematic planning, GIS based land inventory can release substantial public land for affordable housing redevelopment in existing urban areas. Financing of social housing can be supplemented by mortgage guarantee funds, social housing funds, micro financing, land housing-infrastructure bundling, mutual funds, provident fund, insurance and pension funds, general obligation bonds, etc. Optimizing densities and FSI can be effective tools to reduce the cost of social housing. An industrial approach can convert housing construction into housing production, saving both cost and time. Proven technologies and approaches and regulatory support can enable large-scale, low-cost housing production. Industrial approaches using components manufactured off-site, standardization, and improved purchasing and other processes can reduce the time and hence cost by one third.

5. PARTICIPATORY URBAN GOVERNANCE

Processes of urban development are intimately linked with the systems of governance. It concerns the participation of civil society, the issues of transparency and ethics and democratic decision making processes. In this, urban local bodies play a key role.

Independent India inherited a colonial set up of urban local bodies, which continued in the post-independence era. District Collector remained a strong link between the government and the people in the towns. Only one channel of decisions, orders and instructions flows, which is from top to bottom, having no meaningful participation of people in their affairs. Frequent supersession of local and municipal bodies shows total disregard to the principle of people's representation. During the last few decades, government initiated grass roots level reforms in the management of local bodies. With the 74th Constitution Amendment Act 1992, urban local bodies have been assigned greater role in

urban planning and governance. The responsibility for providing basic services and implementing development programs is mainly of local government. India has the distinction of having the largest number of democratically elected local governments in the world-more than 250,000 rural and urban local bodies with almost 3 million elected representatives. However, in most of the states, the state governments are reluctant to part with their powers. Poor municipal capacity and finances are acting as barriers in the area of decentralization.

6. TRANSFORMING URBAN INDIA

Current planning in India is by and large reactive, which has not kept pace with the socio-economic environmental and technological changes. This involves some radical changes and alternative ways of land management, planning and infrastructure development, pollution prevention and urban renewal, which are inclusive and integrated. Land use planning has to change towards strategic planning, collaborative partnership, reforms and new regulatory framework. New approach has to incorporate the socio-spatial elements in the planning strategy for integration of poor in the wider urban system. For physical infrastructure, localized and decentralised systems of sewerage, water treatment, power generation, waste recycling and transit oriented development should be the determinants of planning and development.

Success of new paradigm of planning and urban governance is largely contingent upon capacity and performance of urban local bodies and their legal and institutional frameworks. This needs beginning from the grass roots by way of local planning and new legal, institutional and regulatory framework for coordinated planning, land management infrastructure services, housing, slum redevelopment, urban renewal and transit oriented development. Outdated legal and institutional frameworks, which act as barriers have to undergo a radical change along with governance reforms and capacity building of local bodies. With decentralized, local and participatory planning, the role of local government is undergoing a radical change. Skills are necessary to strike a balance between the economic and inclusive growth and between political process and service delivery. It is necessary that in the spirit of decentralization and democratic governance, the role of civil society and community organizations are incorporated in urban planning.

Capacity building has to play an important role in local planning, whereby planners are able to foresee and manage urban development that aims at sustainability, equity, efficiency, delivery and new partnership. They should be able to work out appropriate legal and institutional frameworks for local participatory planning, social inclusion and financial reforms. Bringing together multiple agencies on a common, unified platform is a major area of public policy that can direct the cities on a sustainable and inclusive path.

Planning in a resource constrained landscape needs mapping and assessing natural and financial resources along with an assessment of their environmental impacts so as to make informed decisions. Planners should adopt disruptive technologies, which are more sustainable, equitable and efficient. This involves adopting the concept of decoupling, which refers to discontinuance of "economic goods" from the "environmental bads". It aims doing more with less and reduction of inputs of resources and energy in order to reduce environmental footprints while achieving higher economic activity. This implies that planning has to move beyond the familiar labels like smart, sustainable, green, holistic, energy efficient, transit oriented, world class, innovative, iconic, etc. It would make more sense if it addresses the local issues like livelihood, services, transport, education and health, relates with local climate and culture and engages the community, poor, women, children, business and politicians more closely.

7. CONCLUSIONS

The above discussions involves radical changes in the way we think and plan. We need a shift from logic to magic, talent to innovations, from focus to chaos, from uniformity to diversity, perception to visual and from linear to experimental. Success is 80 per cent access. Within the various constraints one has to step into chance and turn a chance into a plan. The conventional scope of planning based on information, intelligence, systems and structures has to be enlarged with inclusion, intuition, innovation, charisma, culture, emotions, disruption, values, aspirations and endurance. The plans need not be comprehensive, but have the clear attributes of subtraction, unification, multiplication and division.

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Deciphering the 'City': A Methodological Exercise

Gauri Kopardekar

Abstract

A lot of international and national literature on cities reveals application of newer methods. Major Indian cities have been covered by different researchers but mainly through a case study approach. Ethnographic studies also dominate the literature on cities. Coffee-table books have been a popular literature tracing the development of such cities from their ancient past to modern existence. Some serious attempts have been undertaken to plot the evolution of a city from policy angle and through a lens of economic development. This paper makes an attempt to study literature by researching different cities world over and from India in order to find out new trends of studying socio-political-economic aspects of a city.

1. INTRODUCTION

The Growth Story of India shall be written on the canvas of planned urban development is the catchphrase of the Union Ministry of Urban Development of India (http://moud.gov.in accessed on February 18, 2016). This slogan highlights the inescapable urban reality of India that is getting transformed into a city and now a step ahead with 'smart city.' Not only in India but internationally this is true as Wellington E Webb, former Mayor of Denver, USA has rightly observed that "The 19th Century was a Century of Empires; 20th Century was a Century of Nation States while the 21st Century is a Century of Cities" (Eger, 2016 and Varkhedkar, 2018). This decade starting with 2011 is conceived to be a decade of cities as the focus of socio-economic and political forces have shifted towards cities and urban areas. Annual Report of Eurocities also predicts that the future of Europe lies in cities and it is critical for the development of Europe as a whole (Eurocities, 2017).

A lot of international and national literature on cities reveals newer methods and different attempts while studying the concept and reality of the city. Qualitative approach has been prescribed as compared to the quantitative one so as to capture constantly evolving urban environment (Maginn, Thompson and Tonts, 2008). This paper is an attempt to look into a variety of methodological attempts employed by different scholars while deciphering the socio-political and economic foundation of different cities. The focus is mainly on the methodological exercise undertaken by different scholars. Also it is an attempt

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to understand whether plurality of methods and interdisciplinary approach gives a justice while connecting the different aspects of a complex reality of the city.

2. MULTIPLE PATHWAYS: METHODOLOGICAL PLURALISM

Social sciences involve a spectrum of methods for engaging in an objective and scientific inquiry. Social sciences contribute to heterogeneous body of knowledge that explains the various forms of social phenomena. So it requires studying different methods of inquiry, empirical reasoning and different models for explanation (Little, 1999). Advances in methodology have helped scholars to undertake research in a variety of new areas. There are scholars emphasizing either qualitative or quantitative approaches. However, experimentation on methodological pluralism has been used quite frequently (Donatella and Keating, 2010; Palshikar and Suri, 2013) as "one needs to be open to multiple methods because not the tools of study but capacity to understand and interpret lies at the heart of the endeavour called study of politics" (Palshikar, 2010).

Now more scholars have preferred to adhere to alternative methods such as discourse analysis and archival methods (Vaid, 2013) by focusing on interpretation of texts and narratives (Alba, 2012), in-depth interviews, ethnographic studies, focus groups and content analysis. The Perestroika Movement (Horn, 2015) has been called for in the discipline of political science. Michael Coppedge argues about democratization of research methodology (Coppedge, 2012). This may give freedom to the researcher to venture into newer areas and to employ a combination of research methods. The researchers in Political Science are trying to be issue-driven so as to help the discipline to address methodological concerns through multiple lenses of explanations (Horn, 2015). Sanford Schram quotes Roger Smith and Ian Shapiro appealing to move away from method driven research toward problem-driven research addressing fundamental political concerns (Schram). Yogendra Yadav calls for "a theoretically oriented yet empirically grounded engagement with politics in the form of conceptual and comparative analysis, analytical and political history, and ethnography and survey research" (Yadav, 2008).

3. RESEARCH METHODS FOR CITIES: GOING BEYOND CASE STUDIES

Social scientists including geographers, sociologists, anthropologist, public policy professionals as well as political scientists find the politics of the urban space fascinating. Urban issues being eclectic; address the policy and academic issues by employing a variety of methods that cover qualitative and quantitative approaches (John, 2005). This heterogeneity of approaches calls for use of plurality of methods for understanding the urban phenomena. Martha Alba observes that "the urban research is typically carried out through similar

methods that are used by the rest of political science as the aim of any research is to meet the standards of inference, validity in order to make it scientific" (Alba, 2012). While employing a qualitative approach, Alba justifies the use of interviews while studying the city of Mexico. "I think that the study of memories of the city, linked to the individual's life trajectory, requires a methodological perspective that makes it possible to observe an urban experience, built up over the years, at the center of the various social and institutional groups in which the life of the resident took place. Older adults' narratives of the city definitely describe their urban experiences, social representations and collective memory" (Alba, 2012).

City as a dynamic existence, imagined as a 'jigsaw puzzle' (Loksatta, 2016) having a numerous pieces of a history, a geography, an arena of political contestation, an evolution from its antique past to modern reality, a reflection of colonial past, a complex lifestyle, a matter of perception, co-existence of luxury and poverty, a job magnet and much more than a mere urban construct that makes it a very complex existence altogether. Such a phenomenon attracts a lot of scholars to comprehend the underlying strands that weave an urban fabric. A lot of studies and research have covered different aspects and facets of cities world over. Urbanization and globalization has brought the city prominently in the commercial and academic imagination.

Majority of urban studies have been done in the form of case studies or in ethnographic way (John, 2005). Also Marina Peterson and Gary McDonogh (2012) in their edited volume of Global Downtowns analyze different European, American, Asian, Latin American and African global cities through individual case studies. Numerous contributors have analyzed cities through ethnographic and cultural lens to categorize "downtowns as products of the activities of planners, power elites and consumers and as zones of conflict and competition" (Peterson and McDonogh, 2012). John Peter observes that the case studies induce the reader to probe the case along with the researcher, making it more immediate and memorable than a statistical compendium. Hence, are common in urban political analysis (John, 2005). Comparative urban ethnography has been used for tracing transformation of old city centres into new ones. Urban researchers use sociological models for studying public policy, power in urban political systems. Mostly, the case studies that use the standard methods of interviewing, collecting secondary sources and interpreting data have been used (John, 2005).

John Peter cites the 'blended methodological approach' used by Reese and Rosendfield where they used quantitative methods for surveying Canadian and US cities for analyzing the content of local economic development policies. The data was used to select nine cities with different leadership models and civic

cultures to test the hypotheses about what affects policy outcomes. Similarly John refers to the 'most-similar-most-different method' employed by John and Cole to generate inferences by selecting two pairs of cities that are similar across countries but are different institutionally. The effort was done in order to match and compare a couple of policy sectors of education and economic development that originate from distant background. The study of city-suburb relation highlights the four major research styles employed as ethnographic studies, trend analysis, statistical and organizational approach (Adams and Savitch,1997). Ethnographic studies are historical narratives that are descriptive in nature that present the development of cities in chronological manner. Such a style of presentation enables the audience to traverse the evolution of a city and its suburbs. The city being a place of endless transformation, Robert Park examined the concept of 'City' through laboratory method, while Ocejo revealed how Park and Burgess employed multiple methods while studying cities. Case studies have been supplemented by personal documentation, autobiographical life histories and by using Maps (Ocejo, 2012).

4. ACADEMIC AND INSTITUTIONAL RESEARCH AGENDA

Many universities in Europe and America have invested in interdisciplinary research by a number of scholars on cities from Africa, Latin America, Europe, and North America. London School of Economics and Political Science has developed an international centre carrying out research on and about cities and also for covering innovation in cities while University of London has also undertaken research and made available a repository of research of cities. Roger Caves edited an 'Encyclopedia of the City' (2005) covering a spectrum of concepts related to a 'complex organism' (Caves, 2005) called city. As Caves describes 'City' and 'anything and everything', the work captures a large canvas encompassing city-form, development, inhabitants, culture, environment, economy and polity and also overall impressions, books, important works, scholars, researchers by accentuating the importance of this wider concept, however, it does not trace the evolution of any particular city in this voluminous work. It covers different research methods like film-studies, ethnographic studies however the major stress is on case study approach (Caves, 2005).

International Institutions like United Nations and World Bank have undertaken extensive research on urbanization in developing world by covering major industrial and developed city-centres. European Commission has tried to implement an '*Urban Agenda'* for its member states and also carried out a research to find quotient of liveability and diversity of major urban centres from European countries. Many real estate and financial management consulting firms cover different global cities from economic and investment angle as well. Forums like European City Marketing are providing digital platforms for sharing research

on cities in Europe. These firms use different criteria to measure urban elements and also conduct surveys to come to conclusion. Findings of such surveys help in policy-making and for assigning comparative rating to different cities considering their future growth potential.

Behavioural scientist Robert Dahl studied American Cities as institutions involved in democratic decision-making. He studied formal and informal power-structures from New Haven, a city from Connecticut, USA by employing a case study approach for his research. Taubman College of Architecture and Urban Planning under the aegis of University of Michigan conducted an extensive research on the city of Chicago unfolding changing composition, spatial arrangements and its youthful inhabitants occupying the urban space called the city.

5. INDIAN CITIES

One finds a lot of research papers and books covering mega cities and metros and now also the tier II cities from India. However, four cities viz. Delhi, Mumbai, Chennai and Kolkata have been studied but from a descriptive angle. These presidency cities got prominence not only in getting priority in development but also in research endeavours. These cities have been darling of colonial rulers and that special status of these pioneering cities continued in the post-independence India. These cities attract the attention of policy and decision-makers. The scholarship of urban India remained a neglected area till 1960s. It was earlier dominated by village studies as the focus of Indian urbanization was on the impact of proximity of the city on village life (Nair, 2006).

The erstwhile Planning Commission of India (now NITI Ayog) sponsored profiling of twenty cities in India by giving an impetus to the urban scholarship in 1970s. The research focused more on spatial analysis. Some studies used Marxist analysis for ascertaining the role of the state and market in modern urban societies. Such an approach considers physical spaces and hierarchies of gender, class and race and their role in making a city (Nair, 2006). After liberalization, different cities in India have been studied mostly on comparative indices by placing them on an investment matrix. Cities like Delhi, Bangalore, Banaras, Hyderabad, Chennai, Lucknow and Pune have been covered by different researchers, publications and also by international consulting organizations.

'Oxford India Short Introductions : Indian Cities' authored by Annapurna Shaw presents a good account of complexities of urbanization process in India. It tries to cover a broad spectrum of historical and sociological reflections of Indian Cities. Shaw discusses methodological difficulties like difficulty in defining a city and fitting it into particular category due to wide differences of population size, economic and social composition across India (Shaw, 2012).

Janaki Nair in her volume on Bangalore, *the Promise of Metropolis* maps out how different cities have been studied by different scholars from Indian and abroad. This work traces the transition of Bangalore into a metropolis over five decades. Different factors for the growth of Bangalore have been acknowledged. This involves an exploration of historical theme and divided history of the city, old and new economies, religious past and town planning efforts, changing landscape and public life in the city. Also the book presents how private platforms like Bangalore Agenda Task Force (BATF) and Janaagraha have been used as a vehicle of transformation of the city and have forged a new relationship with stakeholders. This research shares significant elements that provide a framework for analyzing other cities in India.

'Delhi Urban Space and Human Destinies' is an attempt to go beyond the history of Delhi and to trace dynamic relationship among power, people and places. This is a good example of a research on the social and cultural dynamics of the city. The editors feel that the complexity of Delhi cannot be captured into a single way. This particular study has used questionnaires, statistics, maps and photographs and case study for representation that bring out the different strengths and weaknesses. A combination of methods used in this volume help in understanding the alchemy of Delhi. It is a deliberate combination of approaches from social sciences and visual appeal from the field of architecture and photography. Economic and political domain of Delhi cannot be separated so both the strands have been documented along with the life history of the city (Dupont, Tarlo, Vidal, 2000). As Mumbai is the financial capital of India, it finds its place in Urban Scholarship more often. 'Bombay and Mumbai : The City in Transition' edited by Sujata Patel and Jim Masselos presents a collection of stories of the people analyzing their struggles, politics, fantasies and dreams. This volume focuses on the implications of change in Mumbai but not by tracing changes in economic policies and institutions but how the people have initiated different changes in transforming the nature and the form of the city (Patel, Masselos, 2003). This is an inquiry whether in spite of changes, Mumbai could retain its identity or has it lost its distinctive reality in the course of time.

Hyderabad has been projected not only as a cyber city but a prominent centre for Pharmaceutical industry in the decade of 1990s. Hyderabad being a capital of then Andhra Pradesh and now of Telangana has been featured in the form of case study of how changing policy at the central and state level tried to focus on it so as to promote the city as an emerging industrial destination (Kennedy and Zerah, 2008). In this way, different approaches giving an account of social history of cities by using a historical method, constructing an archive on the city, ecological perspective and efforts from geographer's perspective, demographic research and planning studies have been used while deciphering the reality of city. Urban studies and sociological research focused more on social fabric of a

city and now mostly covering the aspect highlighting the isolation, deprivation and ghettoization of urban poor and new culture of gated communities that has mushroomed in urban areas.

Coffee Table books (Loksatta, 2016) have been a popular literature that traces the development of such cities from their ancient past to modern reality. Some serious attempts have been done to plot the evolution of a city from policy angle and economic developmental perspective as well. Maharashtra Chamber of Commerce, a regional chamber in Pune has marketed the city of Pune as an attractive international destination by exposing its advantages to the international community. It has published a 'Pune Guidebook' which has proved to be a handy source as a city guide. Such guide books can also be listed as a methodological tool as it defines the city from different angle by accentuating economic and tourist potential of a city. Indian National Trust for Art and Cultural Heritage (INTACH) has published a Heritage Map of Pune highlighting the tourist attractions which also proves to be a helpful tool that documents heritage of a city in most attractive fashion.

6. POLITICAL CITY SCAPE

While mapping the methods of urban studies, a curiosity aroused whether such works while using an interdisciplinary approach, bring out the underlying political reality of a city to the fore. This is not baseless curiosity as much work in urban areas has been conducted by covering anthropological and sociological dimensions. Jodhaka's work has been quoted by Janaki Nair explaining how earlier works focused on the description of the cities rather than challenging the prevalent social order or transformation (Nair, 2006). Narayani Gupta explored the role of political and administrative elites while covering the controversies of conservation of Delhi (Dupont, Tarlo, Vidal, 2000). A case study of Hyderabad by Kushal Deb discusses the role of the state in city growth and overall development. It introduces how the state has been an initiator of growth process and how it controls the land prices, land ceiling and development of master plans (Deb,2006). Janaki Nair in her account on Bangalore reveals how market forces increase the social distance between the urban elites and lower classes. It also brings out the future of many Indian metropolises where the state has been reduced to a mere service provider and how both, the state and the market lose the primacy (Nair, 2006).

Political scientists initially focused on patterns of rural life. Peterson and McDonogh studied cities from the political angle of conflicts, interplay of power elites and masses and as zones of conflict, competition and contestations in the urban arena. As a set of complex relationships exist among different city sections of city, it has become a key human resource for research projects, where the local urban forces matter (John, 2005). Studies from angle of political economy,

hierarchy and power-relations, domination, hegemony and elites, power politics, space and rights of citizenship, dynamics of core city and of suburbs provide a larger political backdrop for understanding the dynamics of urban decision-making and city development process.

Apart from looking at specific city, a city, as a concept, has been researched by using different lenses by many researchers. Patrick Geddes defined 'World Cities' in 1915, Peter Hall tried to define the multiple roles that 'World Cities' would play as the centre of power, trade, finance, arts, culture and adding newer areas in its sphere since 1980s (Hall,1996). In recent literature one finds emergence of newer concepts about 'Cities' such as an Organic city, Green city, Natural city (Soni and Virmani 2014), Global city, Inclusive city, People-friendly city (Jha and Siddiqui, 2000), Network City developed by James Heitzman (Nair, 2006), Sustainable city (Suri and Birch, 2014). This entire concept can bring out a multi-layered complex reality of a concept called a city.

7. CONCLUSIONS

Above narrated are some instances of city research. However, several such studies undertaken in interdisciplinary approach interpreting the evolutionary trajectory of city development are available for deeper and further understanding of the dynamic and complex reality of the city. Still there is a need to shed light on the nuances of political relationship, cityscape and built forms, designs and dynamics of city politics, prevalence of violence and contestations of city dwellers. There is also a new call for globalization of research methods in urban studies. But this area is yet to be explored. A comparative approach put forth by Palshikar and Deshpande while comparing the states in Indian politics is certainly a useful base for comparing cities and for searching linkages between the political developments and the economic conditions (Palshikar and Deshpande, 2009). Cities cannot be similar; they differ due to their history, colonial pasts, their position as the first or second capital, a shared status, newly developed capital cities, demographic and structural complexities, status of being a financial or trade centre and due to their cultural diversity. Their socio-political underlying currents are unique that need to be interpreted in order to understand the present and future of cities in India with the help of new methods and novel tools.

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Resource Mobilisation for Urban Development in India: Some Options and Experiences

Ramakrishna Nallathiga

Abstract

The development of cities primarily constitutes the development of land and housing as well as the provision of community infrastructure services both physical and socio-economic for the growing urban population. The creation of urban development infrastructure i.e. land, shelter and civic services would require dispensing a large amount of resources by the urban local governments. The addition of other functions viz., urban poverty alleviation, urban transport, urban forestry and animal welfare, has further compounded the resource needs. Therefore, the Urban Local Bodies (ULBs) need to mobilise resources for meeting the pressures of urban development outside traditional framework, which is analyzed in this paper. Apart from reforming and strengthening conventional resources, it is suggested in this paper that the ULBs have to exploit the potential of non-conventional means of resource mobilisation.

1. INTRODUCTION

India has been experiencing a rapid growth of urban population since 1980s and increasingly becoming urbanized, *albeit* at a steady pace. In terms of percentage of total urban population, according to the Census 2001, around 28 out of every 100 persons in the country reside in cities and towns as compared to only 11 per cent people living in urban areas in 1901. Table 1 provides data on the number of urban agglomerations and towns, total population, urban population and urban population as a percentage of total population for these units in India for various census years from 1901 to 2011. It clearly shows a steady growth in number of urban areas and the share of urban population. Table 2 also implies that India has been growing very rapidly in the twentieth century, particularly after attaining independence, and it is characterized by rapid urbanization, particularly during the two decades of 1961-91. Table 2 also shows that the annual growth rate of India's total population as well as urban and rural population during this period were historically large. The growth rate of urbanization during the latter half of the century almost doubled as compared to the first half of the century.

Rising population and growth of urban areas raise an important question of how to provide and maintain the development infrastructure for an increasing number

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Table 1: Number and Population of Urban Agglomerations and Towns in India

Census Year	Number of UAs/ Towns	Total Population	Urban Population	Urban Population as % of Total Population
1901	1,830	238,396,327	25,851,873	10.8
1911	1,815	252,093,390	25,941,633	10.3
1921	1,944	251,321,213	28,086,167	11.2
1931	2,066	278,977,238	33,455,989	12.0
1941	2,253	318,660,580	44,153,297	13.9
1951	2,822	361,088,090	62,443,934	17.3
1961	2,334	439,234,771	78,936,603	18.0
1971	2,567	548,159,652	109,113,977	19.9
1981	3,347	683,329,097	159,462,547	23.3
1991	3,769	846,387,888	217,551,812	25.7
2001	5,161	1,028,610,328	286,119,689	27.8
2011*	7,935*	1,210,193,422*	377,105,760*	31.2*

Note: 1. Urban Agglomerations, which constitute a number of towns and their outgrowths, have been treated as one unit.

2. The total population and urban population of India for the year 2001 includes estimated population of those areas of Gujarat and Himachal Pradesh where census could not be conducted due to natural calamities.

3. The total population and urban population of India for the year 1991 includes interpolated population of Jammu & Kashmir where census could not be conducted.

4. The total population and urban population of India for the year 1981 includes interpolated population of Assam where census could not be conducted.

** Provisional estimates*

Source: Census of India 2001; Census of India (Provisional) 2011

of people. The levels of income and expenditure of local governments are often abysmally low to take care of the responsibilities. The revenue base and expenditure levels of municipal corporations in India are far less when compared to that of the State and Central government. The revenue of municipal corporation's accounts for less than 1 per cent of the country's GDP (Other countries could contribute to 5 per cent of the GDP) and the expenditure incurred by them is far less than the norms of service delivery. This was revealed in the RBI-DRG (2008) study on 'Municipal Finance in India: An Assessment'.

Table 2: Growth in Population of Urban Agglomerations/ Towns: 1901-2001

Census Decade	Average Annual Exponential Growth in Population of UAs/Towns		
	Total	Rural	Urban
1901-11	0.6	0.6	0.0
1911-21	0.0	-0.1	0.8
1921-31	1.0	1.0	1.7
1931-41	1.3	1.1	2.8
1941-51	1.2	0.8	3.5
1951-61	2.0	1.9	2.3
1961-71	2.2	2.0	3.2
1971-81	2.2	1.8	3.8
1981-91	2.1	1.8	3.1
1991-2001	1.9	1.7	2.7
2001-2011*	1.76*	1.22*	3.18*

** Average annual growth rate estimates*

Source: Census of India 2001; Census of India (Provisional) 2011

An important reason for low level of spending on urban development infrastructure is the low importance given to it in the three-tiered system of government, which also affects its fiscal base and performance to a good extent. The 74th amendment to constitution was aimed at giving a boost to the importance of urban sector, but it contributed to the rise in mismatch of revenue resources and expenditure, as it specified only functional base (expanded the list) but remained silent on the fiscal resources to meet the same. Along the increasing levels of urbanization and rising urban population growth, the economic importance of Indian cities is also increasing in an era of globalization; the development of urban infrastructure has to take place at a greater pace so as to absorb these pressures. In the absence of services, a large number of people are forced to live in slums and squatter conditions, without adequate basic amenities. Yet, few municipal corporations in India have budgeted adequate fiscal resources for the urban infrastructure in general, and that for the benefit of urban poor in particular. This, in turn, brings forth the need for the cities to mobilise adequate resources to deal with the issues arising from urban poverty, which is increasing at a greater pace.

This paper reviews the current revenue sources of the Urban Local Bodies (ULBs) for undertaking urban infrastructure development and for the urban poor first. Later, the conventional resource mobilisation means of the ULBs is explained in terms of the municipal finance base. Suitable options for resource mobilisation – both conventional and non-conventional methods – in the cities in order to finance the development projects and programs in general and in order to the provide basic service for the poor, in particular. Finally, the experience of undertaking some of the reforms for improving resources/special efforts of resource mobilisation is also discussed.

2. RESOURCE REQUIREMENTS OF URBAN DEVELOPMENT

The investment requirements for the development of urban infrastructure in India are colossal. Estimates of fund requirements for urban infrastructure are available from several sources. The Rakesh Mohan Committee Report (1996) (also known as India Infrastructure Report) had estimated that the total investment requirements of urban infrastructure were in the range of Rs. 79,300 crore to Rs. 94,000 crore for the period 1996-2001. The fund requirements for water supply and toilet facilities in urban areas was estimated at Rs. 21,000 crore for 2001-2011 and Rs. 22,800 crore for 2011-2021. It had also assessed that the total annual investment needs of water supply, sanitation and road sectors in urban area at Rs. 28,036 crore per year for the period 1996-2006.

Water supply and sanitation are important basic needs that affect the quality of life and productive efficiency of the people. Provision of these basic services continues to be among the core activities of the ULBs. About 89 per cent of urban

population has access to water supply and 63 per cent of urban population has access to sewerage and sanitation facilities (Economic Survey, Government of India, 2004 - 05). These data, however, only relate to access, which is different from quantity of water and quality of service, which may often fall short of the relevant norms.

Tenth Five Year Plan also emphasized upon the provision of these important urban infrastructure facilities with the norms of 100 per cent coverage of urban population with water supply facilities, and 75 per cent of urban population with sewerage and sanitation by the end of Tenth Plan period i.e., March 31, 2007. The funds required for water supply, sanitation and solid waste management during Tenth Plan period (2002-2007) were estimated at Rs. 53,719 crore. As against this, the likely availability of funds from different sources has been estimated at Rs. 35,800 crore, which will fall short of the required funds by 33.4 per cent (Table 3).

Central Public Health Engineering Organization (CPHEO) has estimated the requirement of funds for 100 per cent coverage of urban population under safe water supply and sanitation services by the year 2021 at Rs. 1,72,905 crore. Estimates by Rail India Technical and Economic Services (RITES) indicate that the amount required for urban transport infrastructure investment in cities with a population of 1,00,000 or more during the next 20 years would be of the order of Rs. 2,07,000 crore (RBI-DRG 2008).

Obviously, the resources of these magnitudes cannot be easily mobilized from within the budgetary resources of Central, State and Local Governments. The Central Government, having realized the seriousness of urbanization pressures and having understood the importance of urban areas in promoting economic growth, started an attempt to provide investment support to the tune of Rs. 4,000 crore in the annual budget of year 2004 through National Urban Renewal Mission (NURM). This has been later renamed as Jawaharlal

Table 3: Funds Requirement/Availability in the Tenth Plan (Rupees in Crore)

Estimates of Requirements of Funds		Likely Availability from Different Sources	
Water Supply	28,240	Central Government	2,500
Sanitation	23,157	State Governments	20,000
Solid Waste Management	2,322	HUDCO	6,800
Total:-	53,719	Other PFs & External Funding Agencies	4,000
		LIC	2,500
		Total	35,800

Source: Economic Survey, 2004-05, Government of India.

Nehru National Urban Renewal Mission (JNNURM) with the pledging of support to an extent of Rs. 50,000 crore over 5 years' time period. However, the budgets of State governments do not pledge such large commitment as they have a number of development priorities on which a large amount is spent by them.

3. REVENUE SOURCES OF ULBS

Apart from the fund flows from upper tiers of government in the form of grant or development funds, the ULBs would require adequate funds from their own sources to meet the objectives of facilitating urban development. Table 4 shows category-wise sources of revenue of ULBs in India. Most of the ULBs use tax sources and grants to finance their activities, while the other sources of revenue are often ignored or not tapped to the potential that exists. For example, public debt available from market – both institutional and individual/retail investors – is rarely accessed to finance the creation of new urban development infrastructure. The RBI-DRG Study (2008) pointed to several inadequacies in raising resources by the Urban Local Bodies (ULBs). The finances of ULBs clearly reflect a sorry state of affairs – the revenue receipts grow at a slow pace with a declining contribution of own sources, whereas the total expenditure grows at the rate equal or more than revenue. Much of the expenditure (almost 50-60 per cent of total) goes towards staff salaries and O and M expenses.

Several ULBs do not have any revenue account surplus to transfer to capital account. This situation needs to be corrected through augmentation of resources at ULB level. It is imperative that the ULBs themselves make special efforts

Table 4: Municipal Revenue Sources in India

Revenue Head/ Category	Sources of revenue
Tax revenue	Property Tax, Octroi, Advertisement Tax, Tax on Animals, Vacant Land Tax, Taxes on Carriages and Carts
Non-Tax revenue	User Charges, Municipal Fees, Sale & Hire Charges, Lease rent
Other receipts	Sundry receipts, Law charges costs recovered, Lapsed deposits, Fees, Fines & Forfeitures, Rent on Tools &Plants, Miscellaneous Sales etc
Assigned (Shared) revenue	Entertainment Tax, Surcharge on Stamp duty, Profession Tax, Motor Vehicles Tax
Grants-in-aid	(i) Plan Grants made available through planned transfers from upper tier of Government under various projects,
	(ii)Non-Plan Grants made available to compensate against loss of income and some specific transfers programmes/ schemes
Loans	Loans borrowed by local authorities for capital works etc. – HUDCO, LIC, State and Central Governments, Banks and Municipal Bonds

to mobilize the available resources within their jurisdiction and channel them effectively towards laying down the urban infrastructure services and their maintenance. RBI – DRG Study (2008) also pointed that tax and non-tax resources have not been tapped upto their potential by several ULBs in India, for which reform initiatives need to be undertaken. Property tax is an important tax resource wherein some cities have undertaken reforms to improve tax base (rather than tax rate), but these innovations were limited. User charges are yet to be risen to such levels that they contribute adequately to the resource base of the municipal corporations. The intergovernmental transfers/grants should be used to provide better infrastructure service delivery to the urban poor. While raising resources for urban development and infrastructure service delivery to the poor, the golden rules of Bahl and Linn (1992) are framed in the form of questions:

- Where benefits and beneficiaries are identifiable, levy user charges;
- Where benefits are identifiable and beneficiaries are not identifiable, levy benefit taxes;
- Where neither benefits nor beneficiaries are identifiable, levy general taxes;
- Where administration and other expenses are involved, levy fees and charges; and
- Where long gestation capital works are undertaken, use bonds or debt.

Table 5: Conventional and Non-conventional Revenue Sources

	Revenue Source	
Service	**Conventional Source**	**Non-Conventional Source**
Property related	Composite Property Tax	Vacant Land Tax, Service Tax, Surcharge on Land Registration Duty
Water Supply Related	Water Charges	Water Supply Donations, Water Supply Connection Charges, Water Benefit Tax, Water Betterment Charges
Sewerage Related	Sewerage Charges	Sewerage Donations, Sewerage Connection Charges, Sewerage Benefit Tax, Sewerage Betterment Charges
Solid Waste Management Related	Conservancy Charges	Bulk Garbage Collection Charges
Town Planning Related	Building Permit Fee, Development Charges; Betterment	Betterment Charges; External Betterment Charges; Open Space Contribution; Impact fee; Transferable Development Right; Premium FSI, Sub-division charges; Planning Permission
Engineering Related	No Sources	Road Cutting Charges, Street Tax, Frontage Tax, Cess on Infrastructure, Motor Vehicle Tax/Surcharge on Tax on Petrol and Diesel
Trade Related	Trade Licensing Fee, Shop Room Rent	Business License Fee, Royalty on Auctions
Advertisement Related	Advertisement Tax	Hoarding Charges, Advertisement Placement Fees, Cable TV Fee, TV Advertisement Charges

4. RESOURCE MOBILIZATION AT LOCAL LEVEL: SOME OPTIONS

Municipal Resource mobilization needs not only strengthening the existing revenue sources but also using other sources of revenue. Therefore, both conventional and non-conventional sources need to be tapped to the extent possible within the City. The ULBs may benchmark their levy and utilization with reference to the better performing peers within the State as well as outside it. The ULBs may use the general principles of users pay, beneficiaries pay and polluters pay to the justification such that the citizens are well aware of the need for their contribution towards larger societal cause. Table 5 shows conventional and non-conventional resources that can be tapped by the ULBs.

The ULBs need to exploit various land based revenues, which have greater implication to urban growth and development and concomitant problems like slum formation, redevelopment, rehabilitation and resettlement. The funds realized from land based revenue sources can be effectively deployed for the improvement of urban poor people living in the slum areas. Several of these sources may already exist in the ULBs but the potential of the same may not have been exploited to fullest extent in terms of tapping the public land value. Also, there are several other forms of revenues (or, variants of revenues) that need to be tapped and exploited. Table 6 lists out the various land related revenue sources that can be exploited by the ULBs for mobilizing resources.

Table 6: Exploiting Land-related Revenues in ULBs

Tax Variant	Base of Source
Land Gains Tax	Land capital gains – accruals in land Values
Site Value Tax	Current land rental or capital value of land
Betterments or Special Assessments	Increment in land values due to specific public expenditures including infrastructure
Development Gains Tax/Conversion Tax	Change of "Lower" to "Higher" land use (Once-and-for-all levy)
Purchasable Development Right	Purchase of development right
Auctionable Development Right	Purchase of development right in open auction – Land with FSI in auction in centres
Development in Kind/ Incentive Zoning	Obligation on Developers to install infrastructure or make certain land/facility available for community purpose e.g. Free land assignment
Land Transfer Tax	Stamp Duty connected with change of 'ownership' rather than change of `use'
Vacant Land Tax	Capital value of land not used for any purpose
Property Tax	Rental value or capital value of property – Self-Assessment

5. RESOURCE MOBILISATION OF ULBS: EXPERIENCES OF SOME STATES

There are few municipal corporations in India that have managed to turn around their financial position and positioned themselves as successful cases of emulation worthy.

Ahmedabad and Indore are two such cities, which came out with some innovative methods of improving resource mobilisation:

- Ahmedabad Municipal Corporation was the first ULB in India to raise resources to the tune of Rs. 100 crore through a general obligation bond. It has streamlined its octroi operations and reformed property tax levy in order to back up the debt service obligations of the bond. Though the resources raised from bond remained idle for two years due to procedural bottlenecks, the work tenders have shown a 10-15 per cent decline in the costs quoted that resulted in some savings.
- Indore Municipal Corporation has prepared a city development strategy and undertaken a series of reform measures to raise revenues, particularly the property tax revenue, which helped it to turn around from a losing municipal corporation. The reform initiatives of Indore Municipal Corporation were largely kept simple but doable so that the time and ground do not get lost. Also, it focused on the management innovations, such as better decisions based on information systems, which made a quality difference.

Tamil Nadu and Karnataka have come out with different institutional set-ups – TNUDF/ KUIDF - that leveraged the strengths of a pooled finance mechanism in order to raise resources through the issuance of bonds that helped them in successfully undertaking the water supply and sanitation projects and in meeting with the stipulated terms of the bond issuance. It is now taken up by Orissa and Andhra Pradesh.

The Gujarat experience has shown that (a) land being a scarce but important resource needs to be mobilized, such as through the awarding of development rights, town planning schemes (TPS), plot/layout readjustment and additional FSI/FAR, and (b) it needs to be used efficiently by the way of levy of various taxes, fees and charges for financing the development. Under the TPS of the Gujarat state, more than 250 schemes were implemented and 265 are being undertaken, in which land acquisition is made on awarding compensatory value of land – either land or development rights or money.

The Andhra Pradesh state has also used land based instruments for resource mobilisation to a good level to finance the urban development projects. A new but simplified system of property tax, based on 5 major parameters, was adopted.

The public was informed about the rental value arrived from the simplified formula and objections were called for before property tax assessment returns filed by them. Vacant land tax, development charges, impact fee and goodwill auctions were also used widely to generate additional resources for the urban local bodies.

Mumbai has already a large resource base but there are numerous problems in the property taxation system, like the inequities present in the current method of levy which resulted in large number of litigations and political patronage to the affected. A new capital-based property tax system is now proposed in a simplified form so that some of these shortcomings could be overcome. Together with it, some interesting proposals were made like the accidental death insurance to tax payers through a welfare fund and exemptions to vulnerable groups. Ahmedabad has also simplified its property tax system which is now based on certain basic parameters and it has been delinked from the rent control act. An important step is also that the tax collection system has been improved by allowing payment through 16 city civic centres and 13 bank branches.

Maharashtra has shown a wide range of experience with respect to the mobilisation of resources for financing urban development. Land banking model was developed by the Magarpatta city with the active participation of the citizens, under which they would surrender land in lieu of an equal share of the development company. The development company would develop and sell land for the various uses and utilizes the proceeds for further development of infrastructure. Pune has used transferable development rights (TDR) for acquiring land for development, which is modelled on the already successful experience of using TDR in Mumbai for wide range of purposes like road/ reservation/ slum development. Likewise, e-tendering in Aurangabad has resulted in better contract awarding system and lowered the cost by 5-10 per cent.

6. CONCLUSIONS

Resource mobilisation is important for meeting the challenges of growing urban population and their needs of municipal services. In the absence of supply of such urban development infrastructure, more number of people is forced to live with poor services and quality of life that hampers the economic and human development. Municipal services are critical for the urban poor in particular, as they depend on them. The municipalities and municipal corporations cannot afford to condone the resource mobilisation function, if they have to improve upon the above. The conventional means of resource mobilisation i.e. tax and non-tax resources themselves offer a great potential for improvement. The successful experience of several cities points to the potential for improvement in

property tax revenue in terms of (a) rationalizing property taxation, (b) reforming the levy and assessment methods, (c) periodic revision and even (d) correcting some inequities (as in Mumbai). Adoption by other cities has to be accelerated through some kind of incentive and disincentive measures, as is done to some extent under the JnNURM.

Non-conventional or alternative means of resource mobilisation are more important when conventional resources have limited scope and new means are required. Land banking, land readjustment, transferable development rights and e-procurement are some of the means by which financial resources on land acquisition can be constrained. Municipal bodies need to become aware of the potential. Although resource mobilisation by alternative means of levy or by using different models can be used to generate adequate resources for the city or urban local body. It is also important to make sure that this is linked to investments for the improvement of urban poor on one hand and to improvement of municipal functioning. It is important to come out by earmarking mechanisms, which ensure that resources raised are adequately devoted to up-gradation and development of slum settlements, and equally to ensuring that there is no slipping on the undertaking of municipal reforms that actually drive improvement of municipal performance with respect to service delivery.

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Management of Groundwater in Coastal Odisha: A Study of Balasore District

Mayarani Praharaj, Ph.D.

Abstract

The increased urbanisation coupled with inadequate provision of water supplies for people have contributed to the depletion of ground water near large cities. Besides, erratic and scarce rainfall contribute to the quantitative and qualitative deterioration of ground water in a number of cities in India. Groundwater sources in Odisha are depleting in different parts of the state as anthropogenic groundwater withdrawals exceed natural recharge. CGWB reported that GWT is depleting rapidly in 24 out of 30 districts in Odisha. Aquifers in many areas of Odisha are under stress and gradually drying up. Salinity, ground water extraction and contamination and water logging in different parts of the coastal region need a planned development of the coastal aquifers.

1. INTRODUCTION

Villages, towns, and cities – the entire civilization - have grown where water is available. About 70 per cent of the earth's surface is covered with water. However, the fact is that 97 per cent of the total water on the earth is saline and only 3 per cent are available as fresh water. About 77 per cent of this fresh water is locked up in glaciers and permanent snow and 11 percent is considered to occur at depths exceeding 800 m below ground and about 1 percent is available as surface water in lakes and rivers.

Average annual per capita availability of water in the country, taking into consideration the population of the country as per the 2001 census, was 1,816 cubic meters (cum) which got reduced to 1,545 cubic meters as per 2011 census. In 2001, the average per capita water availability in Odisha was around 3,359 cum per year as compared to the national average of 1,816 cum. With the projected future population, per-capita water availability in the state will reduce to 2,218 cum in 2051. A per capita water availability less than 1,700 cum is termed water stress condition while if it falls below 1,000 cum, it is termed as water scarce condition.

India is a vast country with a highly diversified hydro-geological set up. The ground water behavior in the Indian sub-continent is highly complicated due to the occurrence of diversified geological formations. India is by far the largest

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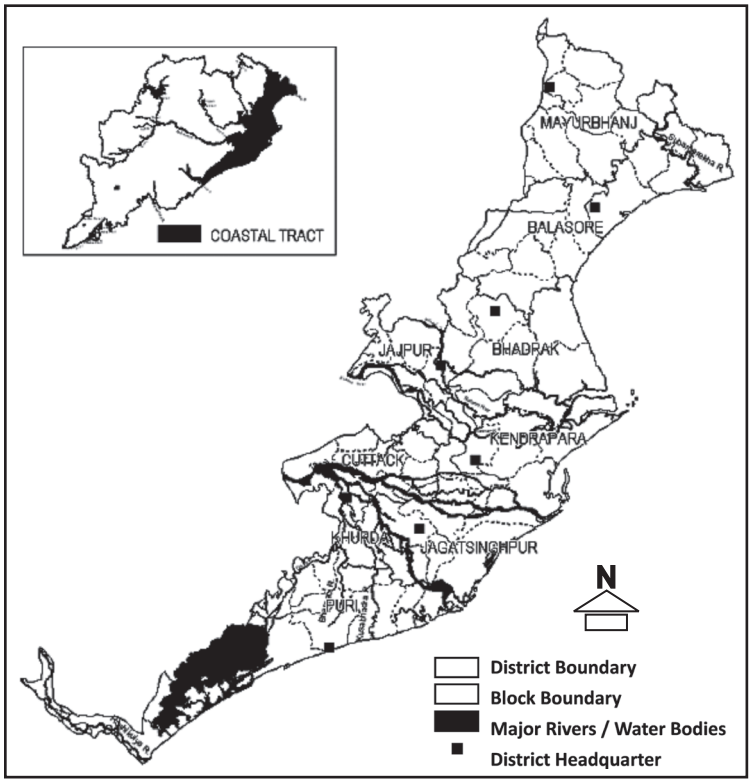
and fastest growing consumer of groundwater in the world, with around 80 of the rural population and 50 per cent of the urban population use groundwater for domestic purposes. Groundwater extraction is growing and it is estimated that by 2020, India will become a water-stressed nation. Besides, groundwater is being progressively contaminated by pollutants, increasing the potential health risks to humans and ecosystems.

Ground water has made significant contributions to the growth of India's economy and has been an important catalyst for its socio economic development. As per the latest assessment, the annual replenishment of ground water resources of country has been estimated as 433 billion cubic meter (bcm) out of which 399 bcm is considered to be available for development of various uses. Irrigation sector remains the major consumer of ground water. Increased urbanization across India has led to severe depletion of aquifers near large cities. It has been reported that in many parts of the country, the water table is declining at the rate of 1-2 m per year.

During the past four decades, there has been a phenomenal increase in the growth of ground water abstraction structures due to implementation of technically viable schemes for development of the resource, backed by liberal funding from institutional finance agencies, improvement in availability of electric power and diesel, good quality seeds, fertilizers, government subsidies, etc. During the period 1951-2001, the number of dug wells increased from 3.86 million to 9.62 million that of shallow tube wells from 3000 to 8.35 million and deep tube wells from negligible to 0.53 million. There has been a steady increase in the area irrigated from ground water from 6.5 Mha in 1951 to 44.98 Mha in 2001. The ground water abstraction structures are projected to be in the order of 27 million as on March, 2011. Such a magnitude of ground water development with sub optimal planning has resulted in creating deleterious effects in terms of ground water depletion and quality deterioration. These multiple challenges emerging different parts of country need a suitable ground water management approach. Augmentation and artificial recharge to ground water reservoir offers a positive approach to overcome the problems of ground water depletion.

Many parts of the coastal areas of India have thick deposits of sediments ranging in age from Pleistocene to recent, which have given rise to multi-aquifer systems of good potential. There is considerable scope for development of ground water from such aquifer systems. However, development of ground water from such aquifers needs to be done with caution and care should be taken to ensure that over-exploitation of resources does not lead to saline water intrusion.

Fig. 1: Location of Coastal Tract of Odisha



2. GROUND WATER RESOURCE IN ODISHA

The State of Odisha presents varied and picturesque landforms. The Southern and Central parts of the State in Rayagada, Kalahandi, Phulbani and Gajapati districts present a rugged hilly tract. Plateau occupies the Northern districts of Sundergarh, Keonjhar and Mayurbhanj and parts of Nawarangpur district in the Southwest. Undulating plains characterizes the major river valleys. A narrow coastal plain borders the Bay of Bengal. The coastal tracts of Odisha covering an area of 15,000 sq km encompass the districts of Balaswar, Bhadrakh, Jagatsinghpur, Kendrapara, Puri and Khurda. It lies in the outfall areas of the major rivers of Mahanadi, Brahmani, Baitarani, Budhabalanga, and Subarnarekha. The region is endowed with high rainfall, fertile soils and high population density. Due to high population growth the demand of water both in agriculture sector as also for domestic use is increasing day by day and this has led to the increasing use of ground water.

2.1 Effects of Ground Water Depletion in Odisha

Groundwater resources in Odisha are depleting in different parts of the State as anthropogenic groundwater withdrawals exceed the natural recharge. Annual replenishment of ground water resource is 23.09 BCM. The net annual ground water availability is 21.01 BCM and annual ground water draft is 3.85 BCM. CGWB reported that GWT is depleting rapidly in 24 out of the 30 districts in Odisha. The aquifers in many areas of Odisha are under stress and gradually drying up. The people of Odisha depend on three sources – rivers, surface storage and ground water – for water. But over the years, the dependence on the first two has progressively dwindled. Most of rivers in Odisha, once perennial, have lost their features significantly. They flow for 6 to 10 months a year depending on the size of the catchments.

The drinking water sector in Odisha depends on ground water for more than 80 percent of its supplies. But in the recent years, ground water table is in decline due to poor level of recharge. At the same time, due to change in the pattern

Fig. 2: Depth of Water Table of Odisha (April 2014)

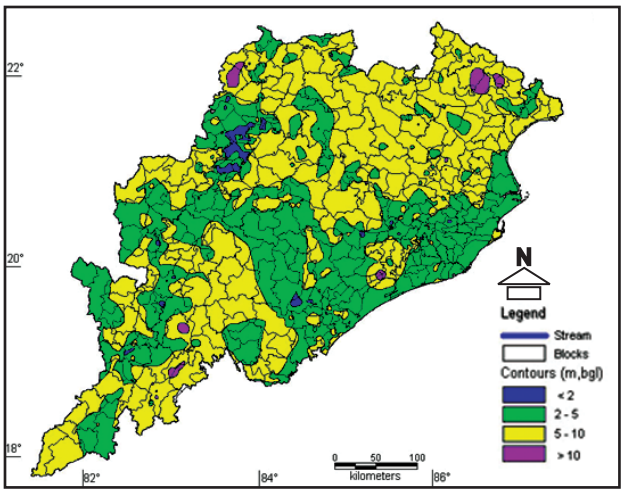
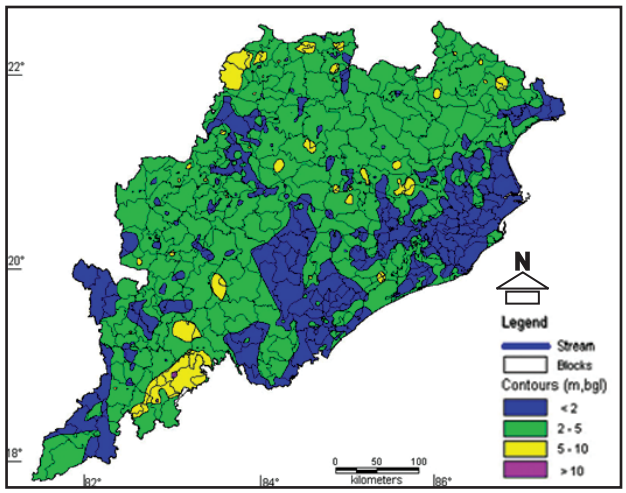


Fig. 3: Depth of Water Table of Odisha (Nov 2014)



of rainfall, people have started shifting from rain-fed agriculture to irrigated agriculture. This is again increasing significant pressure on ground water as people choose ground water as convenient and dependable source.

2.2 Climate, Geology and Hydro-geology of Coastal Odisha

Coastal Odisha is coming under warm-humid tropical climate. Average annual rainfall is 1502 mm. Nearly 86 per cent of the annual rainfall is contributed by the southwest monsoon. The mean daily temperature varies from 24^0 C in December to January to 40^0 C in May. Relative humidity along the sea coast is high throughout the year and varies from 40 to 85 per cent.

Groundwater development in Odisha exhibits wide inter-regional variations due to varied hydro-geological conditions, agro-climatic features, infrastructure and other socio-economic constraints. The coastal areas are also affected with salinity problems. The water is required to cater the need for domestic, agriculture and Industrial purpose. In the coastal area population density is high and agriculture activities are intense with ever increasing demands for freshwater. In general ground water in shallow aquifers of coastal Odisha, within a depth of 60 m to 80 m, is suitable for drinking and irrigation. But its development is constrained due to salinity hazards. Its unplanned development may upset hydro-chemical balance leading to seawater ingress. Thus, the development of ground water in the terrain requires a proper understanding of hydro-geological as well as hydro chemical setup for better management scenarios.

3. GROUND WATER IN THE CASE STUDY AREA OF BALASORE

Balasore is one of the coastal districts of Odisha, located in the northeast of the state. It lies between 21° 3' to 21° 59' north latitude and 86° 20' to 87° 29'

Fig. 4: Land Use/Land Cover of Balasore District, Odisha

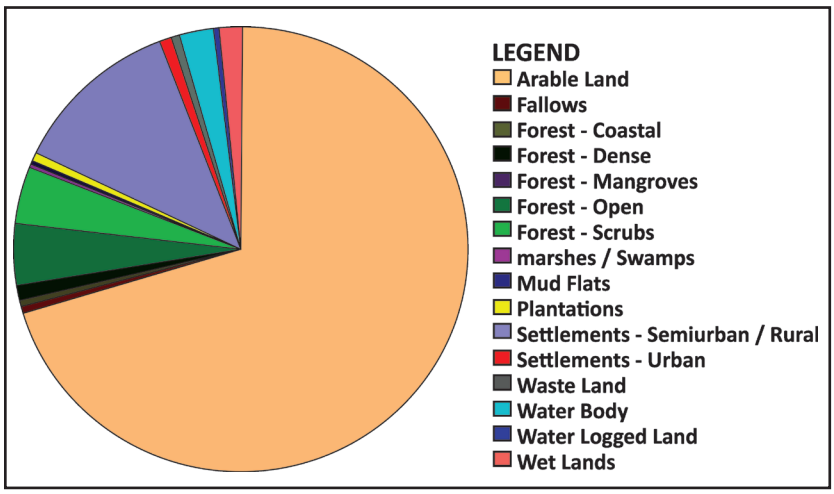


Fig. 5: Area under Vegetables under Rainfed and Irrigated Condition

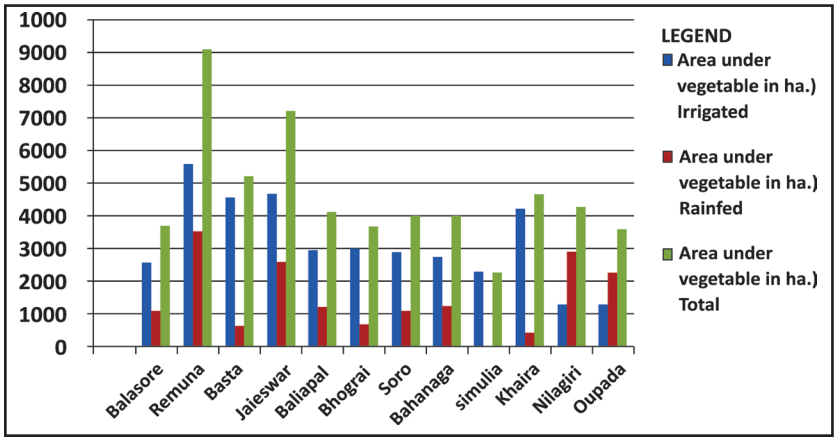
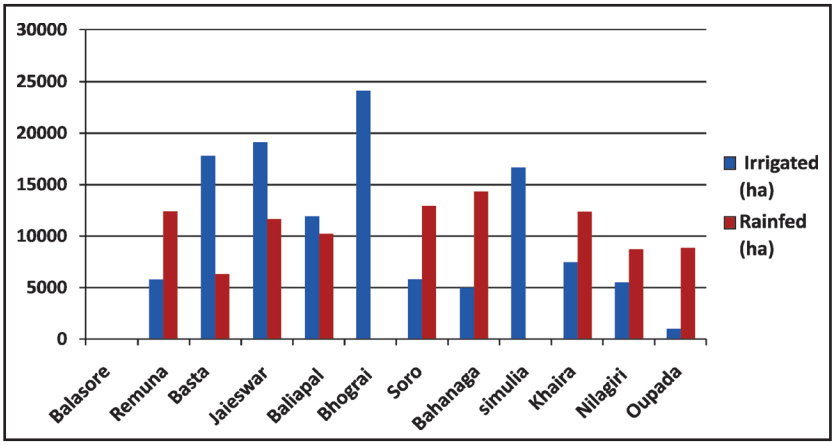


Fig. 6: Area under Cereal Crops under Rainfed and Irrigated Condition

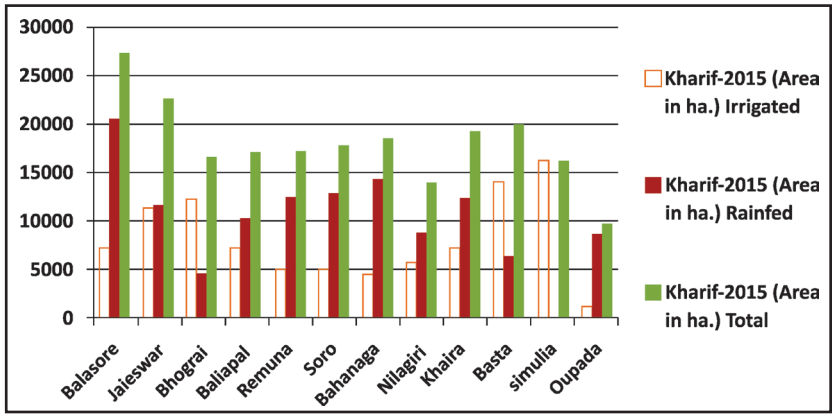


east longitude. The average altitude of the district is 19.08 metre. The District has a total geographical area of 3, 77, 400 hectors and cultivated area of 2,50, 550 hectors (66 per cent of the geographical area). Rice is the principal crop of the district and cultivated in an area of around 2, 20,830 hectors. As per census 2011, density of Balasore district is 610 people per sq. km.

The district receives a rainfall of 1,568.4 mm annually, and the rainy days per year are 73.4. Balasore is crisscrossed by perennial rivers like the Budhabalanga and the Subarnarekha. Smaller rivers also flow through the area. Endowed with such voluminous water resources, the people of Balasore depend upon agriculture as their major source of livelihood and agriculture providing employment opportunities to around 75 per cent of the rural population. Paddy is the dominant crop of the area. In the past, people in Balasore mostly practiced rain-fed agriculture. Many places of the district are devoid of canal irrigation. In the district, Baliapala, Balasore, Remuna, Basta, Oupada, Soro, Bahanaga and Jaleswar blocks have

irrigation coverage of less than 35 percent, and that too is not managed well.

Fig. 7: Block wise Area under Cereal Crop (Kharif)



During the Kharif season cereal crops (mostly rice) are grown in an area of 217560 ha, out of which 94,381 ha is grown under irrigated condition and 1, 23,179 ha is grown under rain fed condition. Among the blocks, Simulai has maximum area under irrigated rice (16,300 ha), followed by Basta (13850 ha), Bhograi (12,108 ha), Jaleswar (11,062 ha) and Oupada has the lowest area under irrigated rice (848 ha). In Simulia total rice area is under assured irrigation facility. The maximum area under rain fed rice is recorded in Balasore block (20,626 ha), followed by Bahanaga (14,330 ha), Remuna (12,474 ha) and Khaira (12390 ha). The highest area under Kharif rice is found in Balasore block (27500 ha), followed by Jaleswar (22,700 ha) and the lowest Kharif rice area is recorded in Oupada (9,695 ha).

Fig. 8: Block Wise Dynamic Ground Water Resources, Balasore District

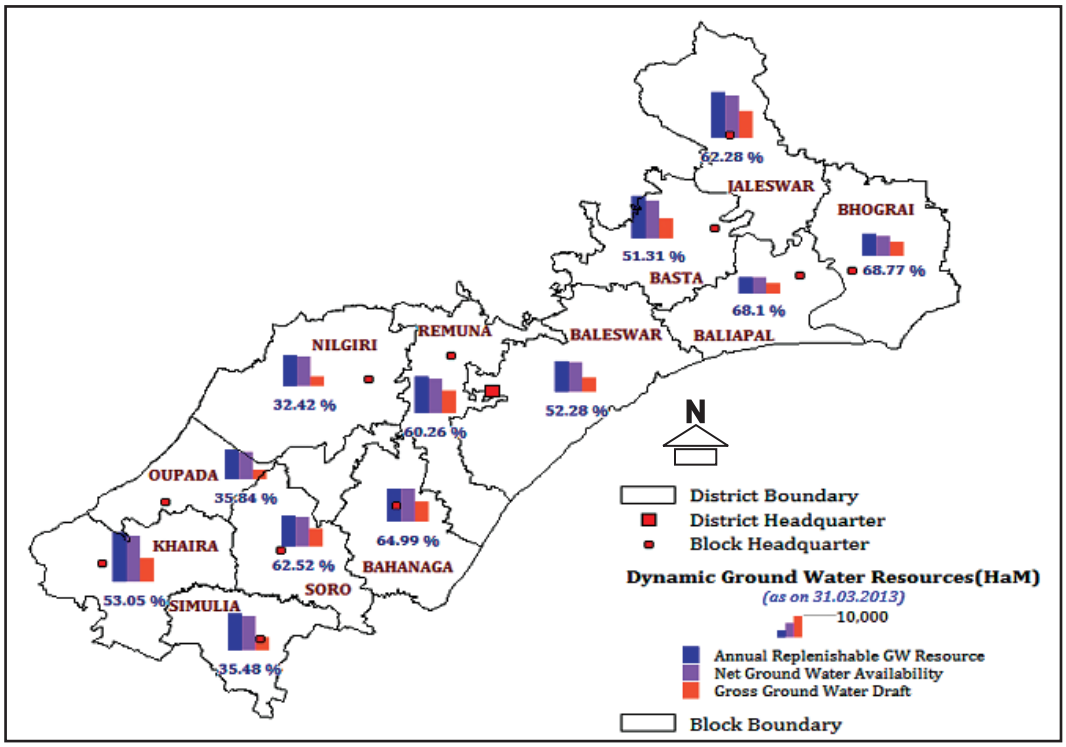


Fig. 9: Pre Monsoon Depth to Water Level in Balasore

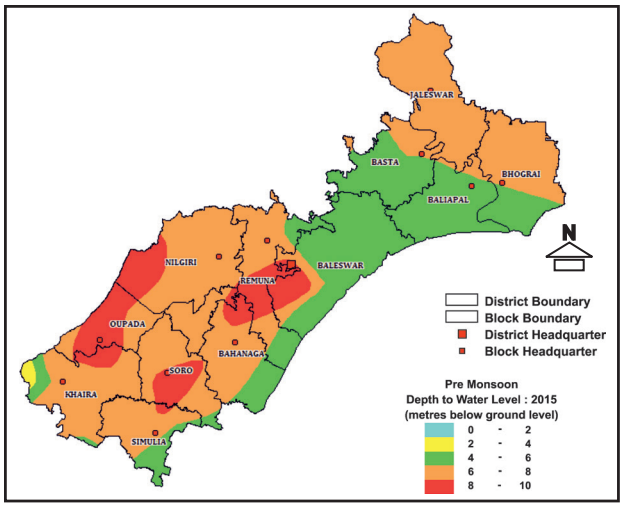
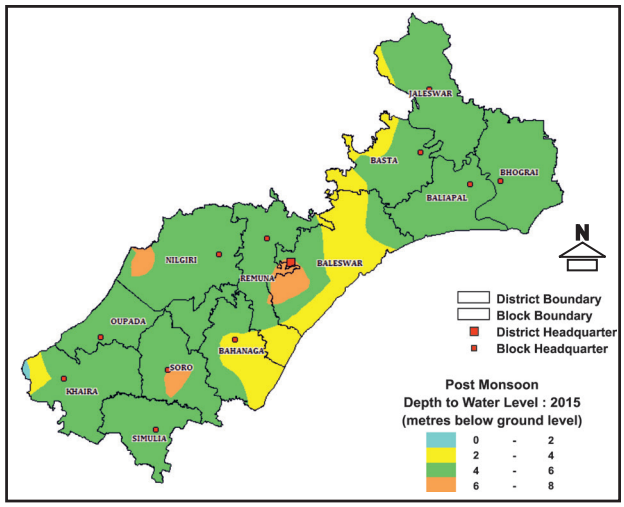


Fig. 10: Post Monsoon Depth to Water Level in Balasore



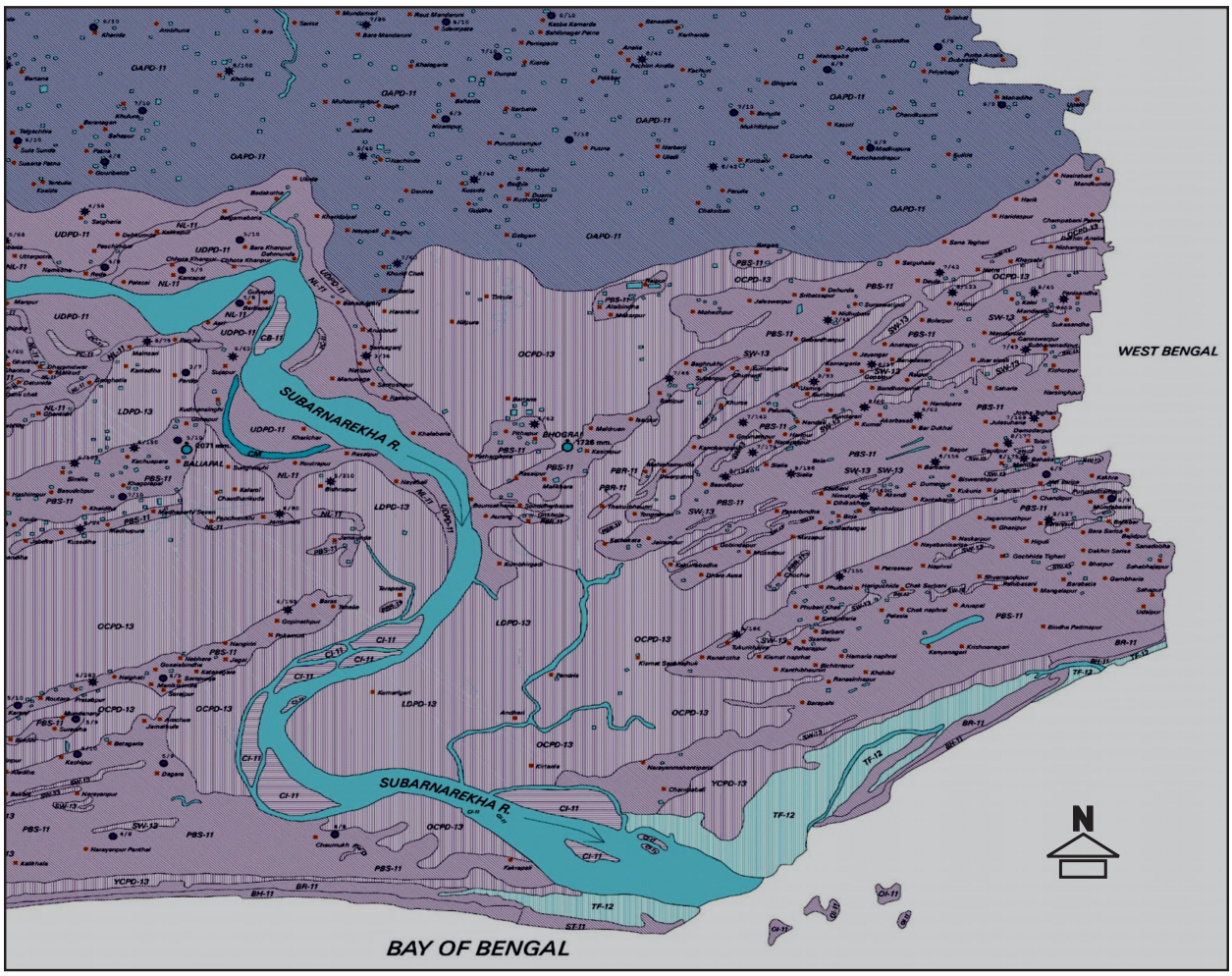
The recent changes in the rainfall pattern have become a bane for the local farmers, as they pose a threat to rain-fed agriculture which is the backbone of the economy of the district. As a result, people are extracting precious groundwater for agriculture. This practice is also encouraged by the government through subsidies. Shallow tube wells and bore wells were developed in Balasore under government schemes and loans from National Bank for Agriculture and Rural Development (NABARD). To sustain their livelihoods, the local people are relying on cultivating high yielding varieties of crops which require more groundwater. Currently, the area under high yielding crops in Balasore is nearly 80 percent of the total cultivated area. Out of total cultivated area of 250550 ha 42.55 per cent is irrigated in Kharif season and 33.21 per cent in Rabi season. However, irrigation is required during Kharif season to save the crop only during moisture stress condition as the crops meet their most of the water demand from the rainfall. But in rabi season irrigation is required throughout the crop growth period. Hence, irrigation facility in Rabi season is essential for increasing the production and productivity of the crop. The occurrence of fresh water aquifers in coastal tract of Balasore restricted by two important factors, (i) Occurrence of hard rocks in the western side and (ii) Salinity hazard problems in the eastern part.

4. GROUNDWATER VULNERABILITY ASSESSMENT

Groundwater vulnerability assessment is essential for management of groundwater resources and subsequent land use planning. Groundwater vulnerability maps provide visual information for more vulnerable zones which help to protect groundwater resources and also to evaluate the potential for water quality improvement by changing the agricultural practices and land use applications. Groundwater vulnerability assessment can be used in planning, policy analysis, and decision making. The remote sensing and GIS tools have opened new paths in urban development and water

resources studies. Temporal data from remote sensing enables identification of groundwater aquifers and assessment of their changes along with the land use changes, whereas, geographical information system (GIS) enables integration

Fig. 11: Ground Water Prospect for Balasore, Odisha



Legend to Fig 11

COLOUR	YIELD RANGE OF WELLS	DEPTH RANGE OF WELLS		
		SHALLOW > 30 M	MODERATE 30 - 80 M	DEEP > 80 M
	> 800 LPM			
	400 - 800 LPM			
	200 - 400 LPM			
	100 - 200 LPM			

	50 - 100 LPM
	30 - 50 LPM
	20 - 30 LPM
	10 - 20 LPM
	Prospects limited to valley portions only (Hills & Plateaus)
	Run off zones / Barriers (Linear ridges / Dyke ridges / inselbergs

of multi-thematic data. The concept of integrated remote sensing and GIS has proved to be an efficient tool in integrating land degradation, land use planning, and groundwater studies.

At the request of the Ministry of Drinking Water and Sanitation, Government of India, National Remote Sensing Centre of ISRO is preparing Ground water prospects maps containing comprehensive data on ground water using Remote Sensing technology and Geographic Information System (GIS). The maps are serving as a reference database for identifying potential locations both for drilling wells and for constructing recharge structures specific to the site. The ground water prospects maps are available both in digital as well as in hard copy formats. The information content is same in both the formats. The hard copy format is available in the form of A0 size map. Each map covers an area of approximately 700 sq. km corresponding to one Survey of India (SOI) topo-sheet on 1:50,000 scale and consists of an exhaustive self-explanatory legend. The same ground water prospects map is also available as soft copy in PDF format.

Since the ground water is a hidden resource, a number of parameters have been studied and analyzed to know its occurrence and distribution. The digital ground water prospects maps are made using 19 independent layers, each layer containing information pertaining to a specific parameter. The map is prepared in such a way that it corresponds to Survey of India topo-sheet on 1:50,000 scale in terms of sizes, shapes and distances of objects. The map can be used in conjunction with the topo-sheet. There are seven colours, i.e. violet to red, used for depicting different yield ranges.

The ground water prospects map contains mainly three categories of information i.e. (i) Reference information (ii) spatial data on ground water prospects and sustainability including relevant hydrological and cultural features and (iii) legend or index giving explanation about the map contents. All this information is organized and depicted on the map in the form of 21 components. The map is titled as Ground Water Prospects Map. The title is given so, because the map not only provides information on the potentiality of the aquifer for the occurrence of ground water but also on the ground water prospects and availability of ground water at a given location. The map is prepared based on the interpretation of satellite data with limited field checks. The input data required for preparing the map is extracted from satellite data using image interpretation techniques in conjunction with ground truth data collected at few representative locations. There are two types of hydrological parameters on which information is provided in the map. First type of parameters includes rainfall, streams, rivers, water bodies, canals, irrigated area, and springs. They indicate recharge condition prevailing in the given area and surface water available for harvesting. Information

on these parameters is represented on the map using different symbols.

5. GROUND WATER PROSPECTS MAP FOR BALASORE, ODISHA

Ground water prospects map has been prepared for Balasore district, Odisha by National Remote Sensing Centre / ISRO using Remote Sensing technology and Geographic Information System (GIS). In the first step, the hydrological parameters that are mapped are studied and analyzed qualitatively to assess the recharge to ground water. In the second step, the water level fluctuation data is analyzed for estimating the actual recharge. However, the recharge is estimated considering data pertaining to one recharge cycle (falling during the ground water prospects mapping period) only.

Based on the Historical Ground Water Exploration Data of CGWB, available ground water exploration data, the aquifer disposition of the district is derived. The same for Balasore district is shown in Fig. 11. A number of wells have been constructed in Balasore District. But for the preparation of 3D Aquifer Map, about 64 exploratory wells, constructed by Central

Fig. 12: 3D Aquifer Disposition in Balasore District

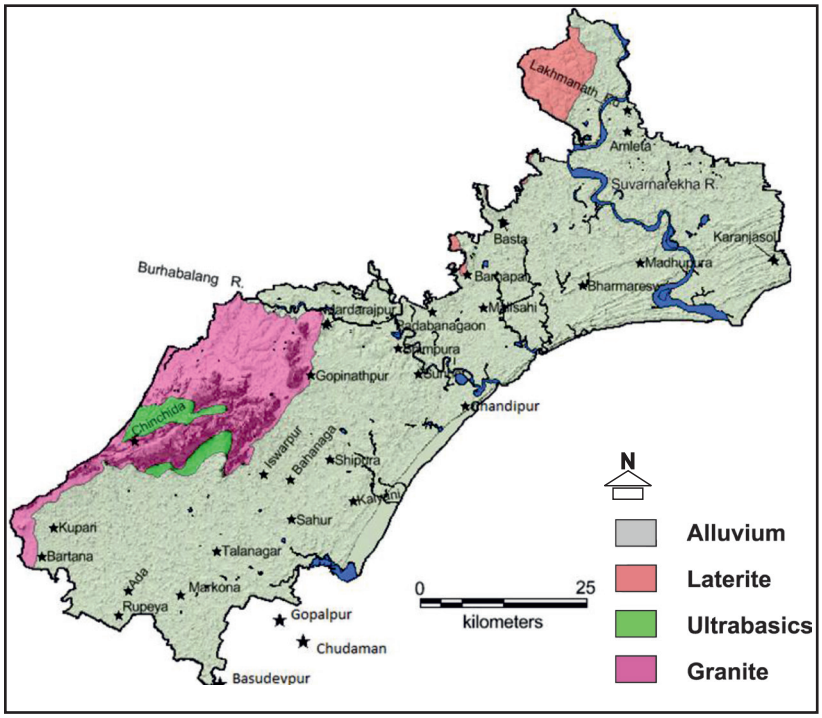
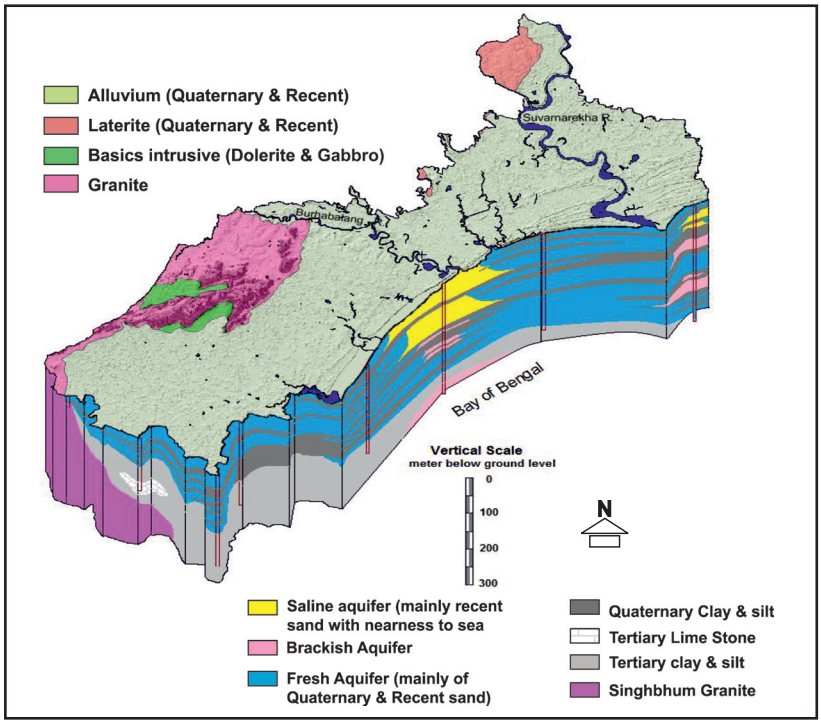


Fig. 13: Exploration Data Considered for Preparation of 3D Aquifer Map



ground Water Board have been considered. The rest of the wells of CGWB as well as that from the other agencies were utilized for validating this 3D Aquifer Map.

The 3D Disposition of the Aquifer System Map of Balasore District clearly depicts a 3 layered aquifer system in the area. In the north western part, the basement is that of the Basement Granite Gneisses which are intruded by the Basic and Ultrabasic intrusive. This basement layer dips towards southerly and south easterly to give rise to a significantly huge and thick pile of sediments of more than 650 metres in the eastern and south eastern part of the district. Just above this basement there are presences of carbonaceous Tertiary sediments, which are overlain by a sediment pile of fluviatile and marine provenance. There is also a lateritic capping over both the weathered residuum as well as over the Older Quaternary sediments.

In case if the aquifers occurring in the vicinity of the habitation are not productive and required quantity of ground water is not possible to extract from them and sustainability of ground water resource cannot be maintained by artificial recharging, the aquifers occurring at a distance from the habitation can be exploited and the drinking water to be supplied to the habitation by transporting the ground water. Even this also not feasible, the aquifers common to a group of habitations can be exploited and a scheme which can supply drinking water to the respective group of habitations can be developed.

Growing demands of water in the coming years will trigger acceleration of ground water development in the coastal tract. For optimal development of the huge ground water balance in the coastal areas detailed hydrological surveys and exploration are needed to precisely acquire areas-wise and site specific information on distribution and yield characteristics of aquifers, chemical quality of ground water, saltwater-freshwater interface, etc. The foremost principle of ground water management in the area is to ensure that fresh ground water reserve is conserved and protected against over exploitation and over-development. Ground water draft in no case should exceed annual recharge. To study the ground water regime and its response to progressive development, it is necessary to carry out water monitoring and reappraisal hydrological surveys. Ground water monitoring is a scientific surveillance system to observe the periodic and long-term change in the ground water regime.

To monitor the effect caused by indiscriminate use of this precious resource on groundwater regime, Central Ground Water Board, South Eastern Region, Bhubaneswar has established about 1659 National Hydrograph Network Stations

(NHNS) or observation wells (open / dug wells) and 98 purpose built piezometres under Hydrology Project in the state of Odisha. The observation stations are open dug wells for monitoring the phreatic or unconfined aquifers and piezometers (purpose built tube wells tapping deeper aquifers) used for monitoring of piezometric heads of deeper aquifers in the coastal Odisha. These are monitored four times in a year along with ground water sampling for chemical analysis in the pre-monsoon period or as required.

6. PRE-MONSOON DEPTH TO PIEZOMETRIC SURFACE

A perusal of data and map reveals that the pre-monsoon depth to piezometric surface varies from as low as 1.5 to as high as 21 meters below ground level. Majority of the areas have the piezometric surface pegged between 6 – 12 meters below ground

Fig. 14: Pre Monsoon Elevation of Piezometric Surface of Balasore

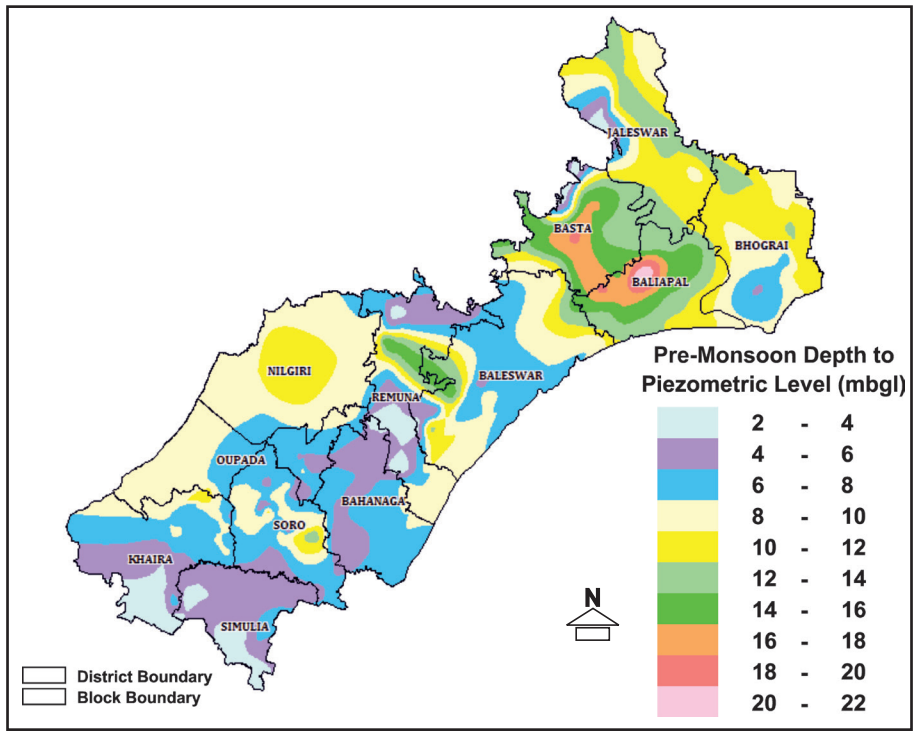
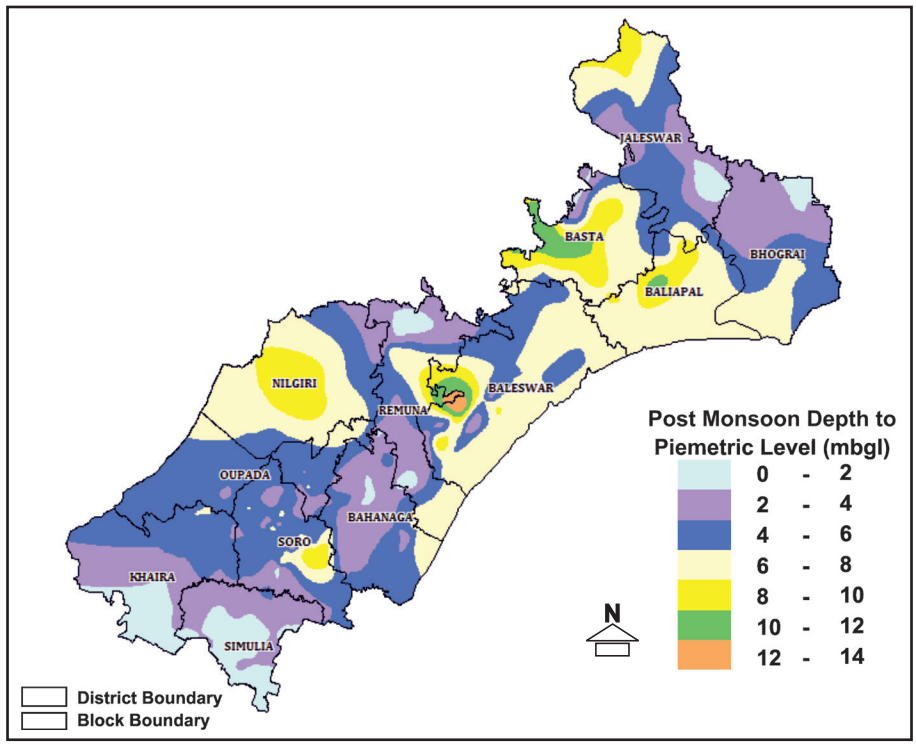


Fig. 15: Post Monsoon Elevation of Piezometric of Balasore

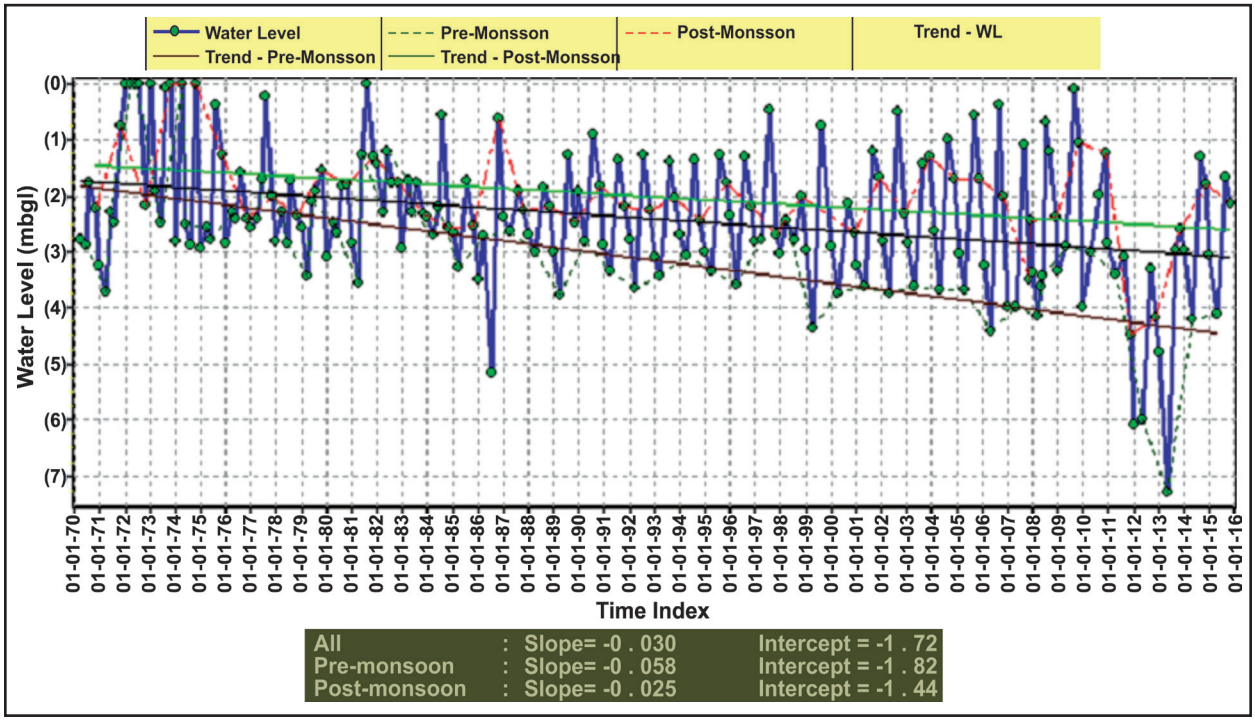


level. Deeper piezometric surfaces (> 12 meters below ground level) are found in the blocks of Nilgiri, Basta, Baliapal, Balasore and Soro.

A perusal of data and map reveals that the post monsoon depth to piezometric surface varies from as low as 0.95 to as high as 12.95 metres below ground level. Majority of the areas have the piezometric surface pegged between 4 – 8 metres below ground level. Relatively deeper piezometric surfaces (> 8 metres below ground level) are found in the blocks of Nilgiri, Basta, Baliapal, Balasore and Soro.

A perusal of data and map reveals that the Pre vs post monsoon fluctuation in depth to piezometric surface ranges from fall of about 0.75 meters to a raise of about 12 meters. This unique nature could be seen in Bhograi Block in the district. But overall, there is distinct rise in piezometric surface in the post monsoon season over the pre monsoon piezometric surface. The highest amount of rise of the order of 8 – 12 meters could be seen in the Blocks of Basta, Baliapal, Bhograi and Jaleswar. The western part of the district shows average rise of about 2 – 4 meters and in the eastern part shows average rise of 6 – 8 meters. Hydrograph of Basta Block is shown in Fig. 16 for clear understanding of the water level in pre-monsoon and post-monsoon period.

Fig. 16: Hydrograph of Basta Block, Balasore



Ground water development in the area can be substantiated by artificial recharge techniques which is very much imperative. By this method, the availability of ground water would be increased and simultaneously the depletion in the deeper ground water regime could be rectified and possibilities the landward ingression of sea water through the deeper aquifers could be avoided. Rainfall is the major source of ground water recharge, which is supplemented by other sources such as recharge from canals, irrigated fields and surface water bodies. A major part of the ground water withdrawal takes place from the upper unconfined aquifers, which are also the active recharge zones and holds the replenishment of ground water resource. The replenishment of ground water resource in the active recharge zone has been assessed by Central Ground Water Board jointly with the concerned State Government authorities. Rainwater harvesting and artificial recharge structures like recharge wells, farm ponds, etc., are proposed to counter localized extraction of groundwater.

In India, the Water (Prevention and Control) Act was passed by the Parliament in 1974, and by 1990 all the states adopted the act. In 1986, the Environment Protection Act was passed by the Parliament. Under both these acts, the states and the central government developed environmental norms for air emissions and waste water discharge for different types of sources. The Odisha Water Policy 2007 and Odisha State Urban Water Supply Policy 2013 clearly say that water for drinking and domestic should be treated as first priority. The objective of the policy is to ensure ground water conservation by tapping feasible surface source and encouraging rain water harvesting.

There have been continued efforts for development of ground water resources to meet the increasing demands of water supply, especially in the last few decades. In certain high demand areas, ground water development (utilization) has already reached a critical stage, resulting in acute scarcity of the resource. Over exploitation of the ground water resources results in declining ground water levels and shortage in water supply. In respect of all urban areas with a population of five lakh or more, to an owner of the building having a plinth area more than two hundred square meters or more than three floors irrespective of the plinth area, to construct appropriate ground water recharge structure. Any local authority or any other authority in charge of approving the building plan shall impose a condition for rooftop rainwater harvesting structure in the building plan having a plinth area more than two hundred square meters or more that three floors irrespective of the plinth area, while according approval for construction of such building.

7. CONCLUSIONS

Unless groundwater is protected in terms of both quantity and quality, there will be increased scarcity of water supply, which would push up costs of water supply. An integrated approach for better groundwater management including technology, legislation, and management is urgently needed. The State of Odisha receives most of its rainfall during the monsoon and most of the precipitation takes place in a span of about 70 to 80 days. Besides, various studies have revealed that the rainfall pattern in Odisha is changing quite drastically. About 500 mm to 700 mm rainfall is taking place within a week, which is causing severe floods and drought in subsequent days. Due to deviation in the pattern of rainfall, and prolonged dry periods in non-monsoon months, flow in Odisha's rivers have reduced drastically. Most of the rivers are lying dry for about two-third of the year. This has been forcing all to depend upon ground water to meet all sorts of water requirements. Therefore, it is imperative to maintain database of all existing and new wells for regular monitoring of ground water status in the State and to take tangible steps to enhance ground water. Changes in rainfall pattern and drastic changes in land use pattern are increasingly affecting percolation of rainwater. Over exploitation of groundwater is another concern. The water supply in coastal Odisha and particularly in Balasore is going to be a serious challenge in future. It is, therefore, necessary to prevent this crisis by making best use of available technologies and resources to conserve the existing water resources and make efficient use of water for agriculture, industrial production and human consumption. Development of watershed is an important program to make best use of rainwater for agricultural production while improving soil conservation and biodiversity. Imposing regulatory measures to prevent the misuse of water would be helpful in conserving water. Besides, there is an urgent need to have a comprehensive accelerated groundwater development plan for the area.

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Action Planning for Water Resource Management: A Case study of Rajasthan Cities

Meesha Tandon

Abstract

Climate adaptation necessitates measures towards water resource management, especially in countries like India where water stress is likely to increase with impacts of climate change. In view of this, a strategy for consultative action planning for urban water resource management was developed and tested in 4 Indian cities. Action Plans for water resource management were formulated in consultation with the stakeholders and multi stakeholder platforms were constituted. The concept promotes perception of urban water cycle as a loop with water, wastewater, storm water (and interactions of these elements with solid waste) forming part of the same cycle while aiming towards a circular economy. A six-stage process is adopted for formulation of water-based action plans for cities. In this paper, the strategy adopted for the formulation of water based action plans for two cities in Rajasthan i.e. Kishangarh and Jaisalmer, are discussed.

1. INTRODUCTION

India is heading towards more than 50 per cent urbanization and is likely to add 300 million urban residents by 2050. But till date, only 68.7 per cent of urban Indian's have access to tap water (Census 2011). However, this still does not imply that they are getting adequate and safe water. Many cities with piped water supply are not able to provide adequate water to all zones: many zones (especially peripheral areas or areas with urban poor) receive water supply once in 2 to 3 days which even increases to once in 3 or 4 days during summers. Already about 15 per cent aquifers in India are in critical condition and this is likely to increase to 60 per cent in next 25 years, unless drastic measures are taken to improve the situation.

A study carried out by the Water and Sanitation Program (WSP) of the World Bank on economic impacts of poor sanitation estimated the adverse economic impacts in 2006 due to inadequate sanitation in India at Rs 2.4 trillion ($53.8 billion), or about Rs 2180 ($48) per person, and about 6.4 per cent of India's GDP. India presently faces water scarcity level of less than 1,000 m/capita/annum water availability and is heading towards a water stress level (500 to 1,000 m/capita/annum). World Bank estimates suggest that India would require an investment of 95 to 160 billion USD between 2011 to 2020 for infrastructure related to water supply and sanitation. Not only is this scale of investment difficult to procure for

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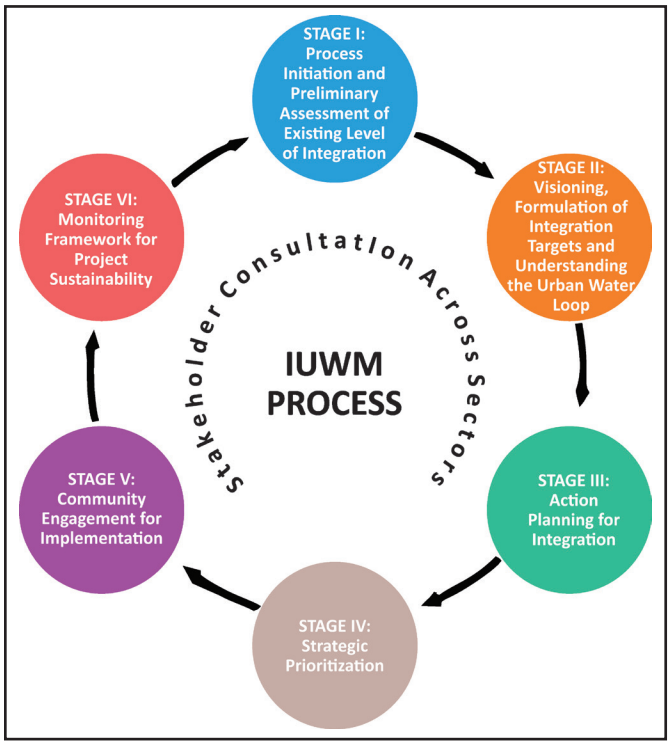
an emerging country like India, but it is also likely to take significant amount of time. Hence, management of urban water sectors in an integrated manner calls for a paradigm shift.

2. THE PROCESS OF INTEGRATION

A six stage process has been evolved based on consultations with stakeholders at community, city, state and national level. This process aims at promoting an understanding of urban water cycle as loop comprising of water, wastewater and storm water (and their interactions with waste). A step by step process has been evolved to encourage cities to understand, plan and manage water sector in an integrated manner as against the present piecemeal approach.

The process involves initiating a consultative dialogue on Integrated Urban Water Management (IUWM) takes a comprehensive approach to urban water services, viewing water supply, drainage, and sanitation as components of an integrated physical system, and recognizes that the physical system sits within an organizational framework and a broader natural landscape (Mitchell, 2006); through formation of multi-stakeholder platforms: Core Team and Steering Committee. Stakeholder consultations were conducted in project cities for implementation of the IUWM process which helped project cities identify issues related to urban water sectors, formulate an IUWM based Vision, formulate an IUWM based Action Plan to attain this vision and to implement priority projects from this IUWM Action Plan.

Fig. 1: IUWM Process

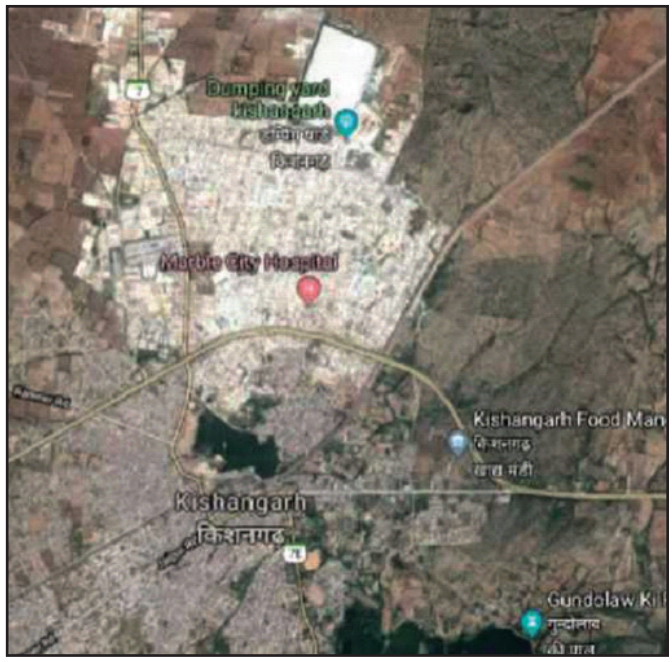


Source: Tandon et al, 2018

First stage involves assessment of existing situation of urban water sectors (water, wastewater and storm water) through stakeholder consultations, followed by formulation of a vision and identification of integration targets in the second stage. The third stage involves formulation of action planning strategy to achieve these integration targets. Stage four helps in strategic prioritization of the action plan for efficient implementation based on social, economic and environmental utility of the project. Stage five

focuses on community engagement for implementation of prioritized actions and stage six establishes a monitoring framework for ensuring project sustainability post implementation.

Fig. 2: Impacts of Marble Processing on Kishangarh



Source: Google Earth

3. DEVELOPMENT OF WATER BASED ACTION PLAN: KISHANGARH, RAJASTHAN

With a population of 1.54 lakh as per 2011 Census, Kishangarh city, located in Ajmer District, is also known as 'marble city'. The city is strategically located near Ajmer and Jaipur and is well connected through NH8 and NH 79A thus, making it an important commercial center. The city is divided into 45 wards with a municipal area of 45.79 sq km as per the Master Plan for Kishangarh. The city sources water from Bisalpur dam located nearly 100 km from the city and discharges wastewater into its many ponds. Sewerage network is presently being laid in the city but is not yet functional. Drainage lines are not adequately laid across the city causing water logging during monsoons.

The city has several large ponds which suffer issues related to wastewater discharge, encroachment and pollution. Marble processing has extensively caused pollution of soil and water in and around Kishangarh. The six stage process for integration of water sector planning was implemented in the city. The key stages are given below:

Assessment of existing status of integration across Urban Water Sectors in the city: Multi stakeholder platforms were constituted to initiate dialogue on integration of urban water cycle: Core Team (decision making body) and the Stakeholder Committee (supporting role) were constituted. Analysis using tool for assessment of existing status of integration showed 'poor' level of integration in the city. A series of open dialogues were initiated to identify key issues impacting the water cycle.

- Pollution of ponds came up as a major issue with focus on need for pollution abatement;
- Low per capita supply (which can also impact sewer flow);

- Low water pressure in certain areas;
- Hard bedrock reduces recharge potential;
- High TDS and Fluoride levels in groundwater; and
- Open defecation and lack of infrastructure lead to hygiene and sanitation issues in slums.

Urban Water Loop Mapping and Visioning: Tool for mapping the flow of water, wastewater and storm water through the city was used to map the urban water loop in consultation with stakeholders. The critical areas and potential areas were spatially mapped for inflow of water, water circulation within the city and outflow from the city. The city gets water from Bisalpur dam (located 100 km from the city) and wastewater from the city goes untreated into the ponds and open areas. An STP is under construction and connections at household level are being provided. The drainage channels and catchment areas of water bodies are impacted by encroachment and pollution. Water security and wastewater related pollution of ponds came up as key issues. A stakeholder workshop was undertaken to initiate discussions on formulation of water based Vision for Kishangarh city. The stakeholders were consulted to formulate the Vision. Integrated Urban Water Management for the city involves conserving and integrating local water resources with the water supply networks, utilizing the rain water harvesting potential of the city, initiating measures towards matching different quality of water with different uses and by creating extensive mass awareness to reduce wastage of water.

Action Planning and strategic prioritization: To achieve this Vision, stakeholders prepared a long list of potential projects that need to be undertaken for integration of water cycle in the city. This long list of projects constituted the water based Action Plan. Key focus of Action Plan was on water quality man-

Fig. 3: IUWM Based Action Plan for Kishangarh (Excerpts)

Objective	Strategy	Tasks
Water Resource Management	Meeting water demand for future (2035) through diverse sources	Meeting water demand for future: reuse and diversification of water portfolio to reduce pressure on water resources
		Reuse of treated wastewater to prevent pollution of water resources
		Using different quality of water for different uses & decentralized water sources / dual supply
	Water Resource Management	Pollute of water resources to be regulated
		Water quality of ponds to be restored
	Revival of traditional stores of water	
	Decentralized water supply	
Extensive Mass Awareness		Awareness generation with involvement of all sections of society
Regulatory framework to support better conservation and management of water resources		RWH to be made mandatory at building, housing and city level Stricter and better laws

agement and wastewater treatment. Using the Project Prioritization Tool, stakeholders prioritized this long list of projects and top ranking projects were short listed for implementation as pilot projects based on highest economic, social and environmental benefits and focus on participatory approach. Two projects were prioritized for immediate implementation involving 100 per cent waste segregation and composting in two wards and closing the water loop in a school complex.

Fig. 3: 4 Way Waste Segregation, Kishangarh

Community Engagement and Monitoring: Extensive community engagement was undertaken to implement the 2 pilot projects in partnership with the municipality. For the waste segregation and composting project, 2 wards were selected in consultation with municipality covering nearly 3800 people. The area had issues related to open dumping and resultant water logging and contamination. A model for 4 way segregation (Fig. 3) of waste using a private contractor was developed and implemented in line with Swachh Bharat Mission. Door to door training to households was given on waste segregation with hand holding support at household level which was provided for more than 2 months. The project was extremely successful and became one of the only projects in Rajasthan with user fee recovery (Rs. 30/household/month). More than 450 residential and 150 commercial units were undertaking more than 90 per cent waste segregation with a user fee recovery of more than 85 per cent. A composting unit was also set up on a neighboring farm for vermi-composting and use of manure for agriculture. Project has been running successfully for more than one year and training to municipal staff across all wards of the city has been provided on waste segregation.

For the second pilot project on integration of water cycle in a school complex, a government school in the city was selected. Consultation with students (Fig. 4) highlighted that the girls' toilet was defunct and female students had to travel back home during school time to use the toilet. Also owing to location in a slum pocket, the school complex itself was subject to open defecation. Hence, a multipronged approach was adopted:

Fig. 4: Capacity Building Activities for Children

More than 100 students were given training on WASH (Water, sanitation and hygiene) and climate change and were encouraged to spread awareness to their families and others.

Toilet block for girl students was developed and provided with 8 toilet seats, handwashing facility, wastewater treatment facility (underground tank which provides on site treatment) and reuse of treated wastewater for gardening.

Hand holding of slum dwellers to sensitize them and facilitate construction of toilets under the Swachh Bharat Mission was a priority. More than 50 such applications were processed and some slum dwellers even undertook toilet construction without any financial support.

4. DEVELOPMENT OF WATER BASED ACTION PLAN: JAISALMER, RAJASTHAN

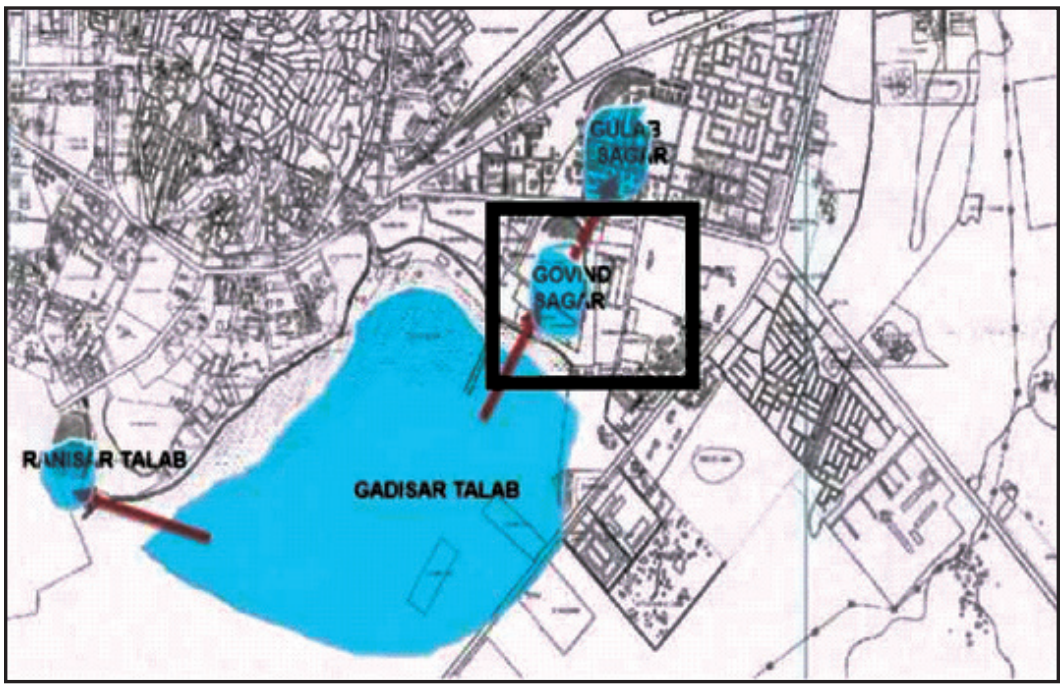
Jaisalmer has a population of 65,471 as per Census 2011 and is the district headquarters spread across a municipal area of 126.27 sq km. The fort city of Jaisalmer was founded on a hillock by Maharaja Jaisal in 1156 AD who shifted his capital from Ludharva. Jaisalmer is famous for its living Fort city (one of the largest living Forts in Asia constructed in 12th Century), lakes, rich culture and sand dunes. These attractions have made Jaisalmer a prominent tourist destination on national and international tourist circuit (In 2011, nearly 2.8 lakh domestic and 1.2 lakh international tourists visited Jaisalmer). Jaisalmer faces extreme climate with average annual rainfall of 164 mm and summer temperatures reaching up to 480 C. A similar process (like Kishangarh) was also followed in Jaisalmer to develop a water based action plan.

Assessment of existing status of integration across urban water sectors in the city like Kishangarh multi-stakeholder platforms were constituted in Jaisalmer. The key issues highlighted during consultations were:

- Need for monitoring of water supply distribution and need for increased rain water harvesting conservation and revival of traditional rain water harvesting structures and systems;
- Inter linkages between ponds in the city need to be documented and restored plastic waste management;
- Encroachment of catchment areas of ponds should be regulated and pollution abatement measures for ponds are required need for wastewater reuse; and
- The stakeholders also highlight the inter linkages between water bodies and greenery. With increasing encroachment of ponds and their catchment areas, the greenery around the desert city is also declining and needs to be revived.

Urban Water Loop Mapping and Visioning: Stakeholders in Jaisalmer mapped the urban water cycle for the city. Absence of perennial rivers or lakes in the region and appearance of seasonal streams during monsoons has traditionally led to development of man made reservoirs in the region. Gadisar pond, the main lake of the city, was built by Maharawal Jaisal in 1156 AD and reconstructed by Maharawal Garsi Singh in 1367 AD. Jaisalmer city also has a series of interlinked

Fig. 5: Interlinked Ponds in Jaisalmer



Source: Base map from Draft Master Plan for Jaisalmer

Table 1: Excerpts from Action Plan for Jaisalmer

Objective	Strategy
Multiple sources of supply	Supplement dependence on Canal water with other sources
Conservation of traditional RWH structures and ponds	Development of blue green corridors and linking people with ponds
	Conservation of traditional RWH strs
	Revenue generation from water bodies
	Revival of water bodies
Capacity building and awareness generation	
Decentralization of services	

ponds wherein overflow from one pond was channelized into the next pond. Gadisar pond was the central pond in this scheme and was connected to more ponds. But these ponds are in a state of disrepair and are subject to encroachment. Several of the ponds and water bodies in Jaisalmer have rich heritage and architectural value and are also acting as a crucial source of water supply for the citizens till date.

Public Health Engineering Department (PHED) was providing water supply sourced from Indira Gandhi Canal and 12 tube wells in Dabla field. In 2013-14, water supply was handed over from PHED to Jaisalmer Municipal Council. Wastewater from the city will be treated at a 10 MLD STP which is under construction (STP constructed, connections to households being provided). In 2006, Jaisalmer faced a major flood event which led to extensive damages highlighting the poor drainage in the city and the high level of encroachment of catchment area of ponds. Key points highlighted by stakeholders include:

- Need to conserve the existing interlinkages between the ponds;
- Need for rejuvenation of the traditional rain water harvesting structures in the city;
- Other than Gadisar, the city has several other ponds which are interconnected: Govind Sagar, Gulab Sagar, Ranisar, etc. Gajroop Sagar is another major water storage structure which was, until recently, used to store water from Deva Minor for supply to the city. Amar Sagar pond is another traditional pond with step wells (baories) and dug wells; and
- To conserve the rich water heritage of the city, citizens formulated a water based vision for Jaisalmer. Integrated Urban Water Management for the city to conserve ponds, ensure reuse of treated wastewater, utilize runoff and conserve catchment area of water bodies for sustainable tourism and city development through community involvement.

Action Planning and strategic prioritization: The key focus of the city was on conservation of traditional ponds and rain water harvesting structures and need to diversify water portfolio by integrating traditional rain water harvesting structures and systems. The need to manage waste, especially plastic waste, was also highlighted as one of the causes hindering efficient functioning of STP and as a causative factor for localized flooding. Based on stakeholder consultations, a long

list of strategies and projects were identified to enable Jaisalmer to attain the Vision. Using the Project Prioritization Tool, priority projects were selected for implementation: (a) plastic waste management for 2 wards (b) revival of traditional RWH structures.

Fig. 6: Govind Sagar Pond

Community engagement and monitoring: Extensive community engagement was undertaken for implementation of projects. For the project on interlinking of ponds, consultations with municipality and community were undertaken to select Govind Sagar pond for revival. This pond is located in the city garden and was reduced to half its size during construction work for city garden. The pond also has an ancient beri (well around 400 years old) which is used for offering water at the Math along the pond bank (superstructure of the beri was unstable). Siltation of the pond has reduced its retention capacity and 2 of the channels bringing runoff from catchment are encroached (one of the channels has been covered with illegal debris dumping along the pond edge). For revival of the pond, the following activities were undertaken (based on topographic studies and water quality testing):

- De-siltation of the Govind Sagar pond and increase in capacity of the pond to near original size with support from municipality;
- Revival of one of the catchment channels and plantation along the pond; and
- De-siltation of beri and creation of stepped well around the beri to improve water retention for summer scarcity.

Fig. 7: Waste Collection Vehicle

For the project on plastic waste management, a different model was adopted: instead of hiring contractor for waste collection, existing municipal staff was trained in plastic waste management. Fort ward along with one more ward was chosen with municipal consent. Waste quantification survey for each house was undertaken and separate bags for plastic waste collection were given. Hand holding support on waste segregation was given to households for one month and further micro

segregation training was given to municipal sanitation staff for one month. Collected plastic waste was sold to Kabadiwala and the earnings were incentives for municipal staff to continue with project work. On request of city authorities, this project was extended to cover complete waste collection and management. Waste segregation training was given to more than 600 households; training and infrastructure to municipal staff (along with wheelbarrow for waste collection in narrow lanes of fort ward, gloves, etc) were also provided. The project was able to ensure more than 80 per cent waste segregation and more than 75 per cent coverage in fort ward. The existing contractual waste collectors in the fort ward were also trained in segregation of waste. A composting facility has also been established for vermi-composting of wet waste. After 6 months of successful functioning, ward level meetings were undertaken to award those undertaking 100 per cent segregation, to discuss issues and to transfer project ownership to the community and municipality.

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System of Land Records and Land Titling in India

Yajush G. Sonar and Chetan R. Patel, Ph.D.

Abstract

Indian records system dealing with land is unique and too complicated following its historic legacy, which can make aware about its socio-economic fabric. The un-sophisticated data sets of land records is the result of colonial legacy, which was only meant to ruin the nation's social, cultural and economic stability and favored their policies. Now it is our responsibility to regain its glory by making indigenous laws that will suit Indian conditions, especially with land titling. Today, multiple agencies dealing with land record makes one confused while extracting information regarding a topic of research. Many more shortcomings of such system are focused by not touching the empirics, but the exhaustive literature to understand this system in a comprehensive way that will consequently enable the necessity and approach to deal with the situation.

1. INTRODUCTION

Land is immovable whose value is dependent on its location. As population increases, demand for land also keeps on increasing with its limited supply. Access to land in terms of land rights has effects on social growth and economic opportunities preserving rights of the title holder against claim of others (Mishra and Suhag, 2017). Efficient land records system benefits efficiency of land markets, taxation systems, rapid resolution of land disputes in courts, better execution of poverty alleviation programs and planning initiatives, etc.

System of keeping land records gained its importance from British reign, whose sole motto was exploitation of the Indian economy through revenue collection making them only revenue centric (Zasloff, 2011). Three types of land revenue or tenure systems were introduced in India under British regime based on agrarian structure evolved from hybrid forms (Mearns, 1999). The Zamindari System is a kind of 'permanent settlement' introduced in 1793 over most of north India covering 57 per cent cultivable area where feudal-lords were declared proprietors of the land to pay revenue. Peasants were made tenant farmers. Ryotwari System introduced over most of south India in 1792 accounting 38 per cent of cultivated area where proprietors were farmers paying revenue directly to the collectors. Mahalwari System introduced in 1820-1840 in the Punjab accounting 5 per cent of cultivated area in which revenue settlement

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was entire village with farmers' shares in revenue was in proportion to their land (Mearns, 1999).

Hence same terminologies relating to land settlement and revenue exists even today (Steudler, Rajabifard and Williamson; 2004). At the same time, growing urbanization pose land records to have critical significance and need urgent updating (Mearns, 1999).

2. NEED AND THE FUNCTIONS OF LAND RECORDS

Land related issues and disputes are nearly two-thirds of all court cases which are pending in India making litigation and affect related sectors and projects. Unclear titles of land accelerate supply of agricultural credit, which encourages mischievous practices leading to deduction in insurance claims. Indian economy shifted from agrarian to industry necessitating infrastructure and land use shift. But land disputes are the key factor responsible for delays in projects. Implementation of new projects needs clarity in the ownership and land value to avoid court challenges in the future. Due to saturation of inner cities, high housing demand results population spilling outwards for new housing projects and here land is not free from land disputes. Similarly, slums occupy prime land in urban areas of which they do not have legal rights resulting in loss of property tax by ULBs. Unclear titles and non-updated land records do not facilitate property transactions generating black money, and develop risks of *benami* transactions, which could be eliminated by land records digitization and updation (Mishra and Suhag, 2017).

3. LEGAL POSITION OF LAND RECORDS

Government of India made land a state subject in 1935 resulting responsibility of land reforms at federal level keeping states' Revenue Department as primary actor in the process (Mearns, 1999). The Registration Act 1908, Transfer of Property Act 1882, Stamp Act 1899, and Evidence Act 1872 and so on are of colonial origins undergoing revisions and are adopted at state levels (IIHS, 2015).

Table 1: Legislative Competency of Land Management

Matter	Arena	Constitutional provision
Land rights	State Govt.	7th schedule, List 2 of Entry 18
Maintenance and survey settlement	State Govt.	7th schedule, List 2 of Entry 44
Transfer and Registration of transactions	Centre + State Govt.	7th schedule, List 3 of Entry 6

Source: Agrawal (2016: 5)

3.1 Institutional Framework

Stakeholders involved in land records management directly or indirectly are, viz. Revenue and Registration Department as core department dealing land records,

Urban Land Administration Institutions which regulate land, Other Stakeholders including Judiciary and financial institutions affecting the system indirectly and the citizens who are end-users. Their coordination and inter-linkage is essential for comprehensive and seamless records system which can be achieved by merging departments at state-level or by assigning them multiple functions (IIHS, 2015).

Rural land records across India are the domain of three state-level departments. The Revenue Department maintains RoR, mutations register and tax registers for land revenue collection. Stamps and Registration Department registers new properties, looks for duties on transaction deeds and collection of stamp duty. The Survey and Settlement Department carries out surveys and prepare measurement maps for spatial records (Mishra and Suhag, 2017; IIHS, 2015).

These departments are functionally exclusive. It becomes even tough to ensure land data matches with each other when more than one agency is involved, which enables citizens to approach multiple agencies to acquire information. Land market becomes inefficient resulting in adverse impacts on infrastructure projects (Mishra and Suhag, 2017).

3.2 Disparity in Rural and Urban Land Records

Poor land records in urban areas are legacy of colonial rulers, who focused on agricultural lands and hence, land in urban areas appear with a single survey number without internal subdivisions. Post-independence coverage of urban areas has remained incomplete and thus resulted in overlapping of jurisdictional boundaries of urban authorities (IIHS, 2015).

4. URBAN AND PERI-URBAN LAND RECORDS INSTITUTION

Urban and peri-urban areas deal with dense properties; socio-economic groups and occupancy, tenancy rights and development rights (TDR's), etc. Regulation of such areas is dealt with by multiple institutions, viz. Town and Country Planning and Development Authorities, ULBs, Industrial/Housing/Slum authorities and special purpose authorities (IIHS, 2015).

Land records in such areas are in the category of legacy records, UPOR and property tax receipts. Legacy records in the form of city surveys are restricted to urban areas in Maharashtra, Gujarat and Karnataka with varied levels of coverage. Integrated Rural and Urban Records which do not differ in urban and rural areas in the form their records structure (e.g. Haryana). New Urban Property Ownership Cards are initiated in states like Karnataka, Maharashtra and Gujarat with mixed success due to implementation issues. The smooth implementation UPOR faces challenges such as lack of legacy records and their updation, jurisdictional issues of associated agencies, spatial accuracy and comprehensiveness of records with different formats and financial considerations. The Municipal Property Tax

Records are maintained by ULBs, but they do not validate ownership and cannot be used in court in case of ownership disputes (IIHS, 2015).

5. STRUCTURE OF LAND RECORDS

Land records management systems vary across states, which essentially depends on parameters like historical evolution and local traditions. Land ownership is determined through documents, which include the record of rights, the registered sale deeds, survey documents and property tax receipts in present condition.

A Textual Record: A Record of Rights (RoR's or 7/12 Abstract in Gujarat and Maharashtra) comprises details such as names owners, limits, local farm name, type of tenure, class of land, assessment and other rights and remarks column significantly. The RoR also cover information of loans taken by the occupant, details on the rights of the owner or occupant and government if any. RoR's are land records, not property records. Any change in the ownership of land via sale, gift, inheritance, partition, etc; is reflected in the RoR through a 'mutation'. Practically, transactions are simply registered (sale deeds) especially in urban areas. Registrations are not title transfers and hence not reflected in ROR's (Mishra P, Suhag R, 2017; IIHS, 2017).

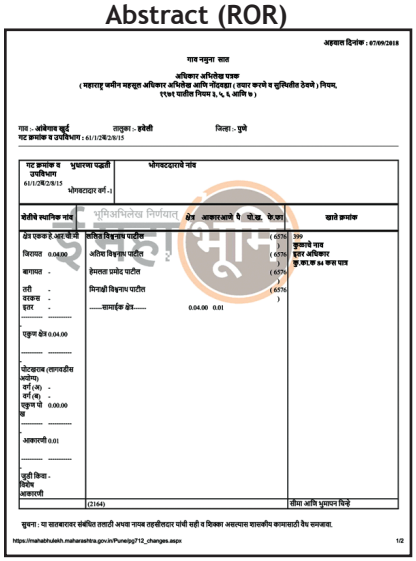
A Spatial Record: The property details in the RoR are supported by a sketch and a larger map collectively comprising the village which includes revenue boundaries, holding area, road connectivity, water bodies present, surrounding land details, land use and topology (Mishra and Suhag, 2017). High error margins and non-resemblance with ROR's makes it irrelevant in courts in the case of disputes. Frequent surveys by the Survey and Settlement department involve regular updating of records as well. Real time updating of the spatial and textual records is initiated at federal modernization efforts (IIHS, 2017).

A Transaction Record: During purchase of any immovable property, the seller and buyer both have to sign a non-judicial stamp paper of a denominated amount known as sale deed. Conventionally, a sale deed includes property details, market price and past details of all transactions getting registered under the Registration Act, 1908 and levies stamp duty. It gets registered on a stamp paper, where its value is curbs as stamp duty. As the deed gets registered, its detail is moved on to Taluka office to begin the procedure of mutation and replicate the same in RoR (Mishra and Suhag, 2017; IIHS, 2015).

6. SCENARIO OF LAND RECORDS IN INDIA

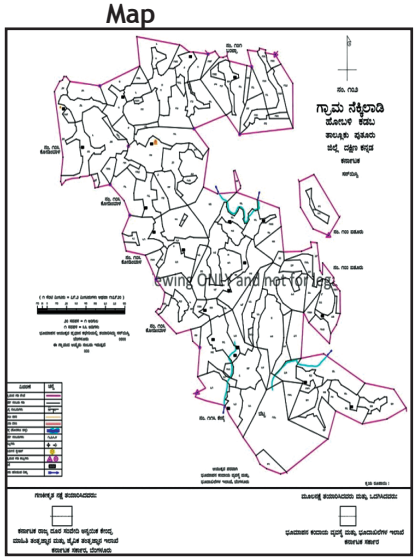
Land records provide information of possessor or occupant and not that of the owner of the land, which is determined by its number of historical transaction

Fig. 1: A Sample of 7/12 Abstract (ROR)



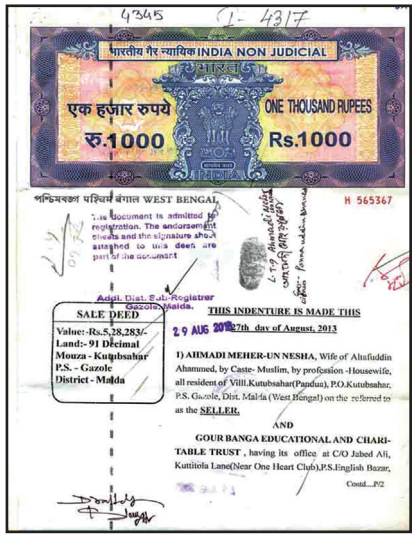
Source: MahaBhulekh

Fig. 2: A Sample of Cadastral Map



Source: HUDA

Fig. 3: A Sample Sale Deed



Source: Internet

(Mishra and Suhag, 2017; Mearns, 1999). India has a deeds-based registration system and presumptive land records where documents used to establish ownership are ROR, property tax receipts, and survey documents which can be challenged in the courts (IIHS, 2015).

At the present, transactions of land can be done through selling, buying, mutation, mortgaging and tenancy. Law regulating land registration related documents is Registration Act 1908, where all sale deeds relating to land are registered making it a public record. Identification of purchaser and seller is justified through various identity proofs, location and land credits. Further only checking the identity of sellers do not imply they are rightful owners. The duty of tallying the title is on the purchaser by delving in past transactions, and not on the government. It is not easy to carry out this procedure if past transactions do not match. This makes easier to question the ownership (Mishra and Suhag, 2017). Land records are kept badly to not reflect the on ground characteristics. Later on a consensus evolved that the lack of incompetent land records put the Indian economy on back foot (Zasloff, 2011).

Recommendation of the Committee on Financial Sector Reforms (FSRC) in 2009 was to move from presumptive to a conclusive titling system also known as 'Torrens System' (Mishra and Suhag, 2017; IIHS, 2015). These titles are guaranteed by state acting as guarantor for its precision and also give compensation if the subjected land is under any dispute. Australia, New Zealand, UK, and Singapore are foreign countries to adopt this system (IIHS, 2015). The conclusive title system is based on four basic principles including:

- A one window system which will furnish all land related documents;
- The cadastral records replicate all the factual details of the property titles;
- Mutation automatically follows the registration without cross checking of past transactions; and
- Government will curb the losses due to defects in the title claiming title insurance.

This system poses some challenges in execution, viz. all existing data is accurate with exclusive information of all past transactions. Single window data collection is tough where land records are dispersed across various agencies. Third, there is need in transformation of legal framework by amending central and state laws to create a unified legislation (Mishra and Suhag, 2017; IIHS, 2017).

7. LAND RECORDS MODERNIZATION AND UPDATION\

Technological modernization of land records was hastened in India just before liberalization. In 1987, Strengthening of Revenue Administration and Updating of Land Records (SRA&ULR) program in Bihar and Odisha was launched following Computerization of Land Records (CoLR) as a pilot project by the central government in 1988-89 and National Land Records Modernization Program (NLRMP) in 2008 which was combination of SRA&ULR and the CoLR led to capacity building, upgradation of survey maps, storage facilities, land and crop records using technological transitions (IIHS, 2015). NLRMP has been exclusively inserted in Digital India initiative by renaming it Digital India Land Records Modernization Program (DILRMP) operationalized under the DoLR, MoRD (IIHS, 2015). The DILRMP is in favour of conclusive titles rather than registering deeds and presumptive land records.

In order to reform property recording system, its comprehensiveness in terms of ownership, possession, extent, classification and encumbrances is to be addressed. Besides clearing existing data backlog and real-time updating through development of protocols is a major concern (Jha, 2015).

Factors such as topology, vegetation, built-up areas, etc; govern methods of survey. Pure ground method, hybrid technology using aerial photography following ground trothing and high resolution satellite imagery following ground trothing are DoLR recommended types of cadastral mapping. The first method is carried out by triangulation methods using survey equipment, viz. total station, etc; and then linked to GIS to create a digital database making it most accurate but costliest to implement. This method uses aerial photographs jointly with ground trothing so as to get reference points for positioning on photographs and finally converted to a digital database. Third method involves GPS coordinates for each ground control point of a land parcel and then old measurement maps along with the ground control points are overlapped on satellite images. This creates one

authentic mosaic later on transforming to digital database (Mishra and Suhag, 2017).

8. ROLE OF GOVERNMENT

There are three options available in moving towards efficient land records system. First being the Administrative Set-up in which either setting up of Independent Department, Authority and Corporation can be the approaches. As far as experience is concerned, National Land Titling Authority and state level authorities will make better results. However, then approach of Legal changes like amendment of the relevant acts or enacting a new law can be an alternative. Third being Legislation options which include legislation of states, where two or more states requests parliament to make legislation or GOI makes a model law and states adopt it with suitable mechanization (Agrawal, 2016).

Basically six main categories of land reforms are adopted by Indian government so far, viz. abolition of intermediaries like *zamindari* abolition, tenancy regulation to focus on security of tenure, ceiling acts so as to bring social equality, attempts of consolidation to fertilize cooperative farming and settlement and regulation of tenancy. Hence, the MoRD's, department of Land resources proposed draft Land Titling Bill 2010 to create a system of conclusive property titles- 'Torrens System' which will bring uniformity across India (Sharma, 2011).

This bill will create an ownership security in minds of people. While banks can be able to verify their property before furnishing credits. The existent problem of tax evaders will be curtailed and stamp duty collection will boost up (Sharma, 2011). Besides merits, it has some shortcomings like compulsion of records upgradation by every individual, supply of wrong information will impose penalties. It requires up-to-date infrastructure for regular upgradation of land values and similarly it has been observed that the bill may also prove curse to marginal farm owners since, their settlement has to be done which will make it unhandy to extract other benefits (Mishra and Suhag, 2017; IIHS, 2015).

9. CONCLUSIONS

Since tribal lands were not settled in colonial days and post-independence period, this work has to be carried out now. Land is not only an instrument of revenue generation, but an asset of mutual prosperity and up-bringing. Major land reforms took place after globalization and decentralization. Till then nation's economy was on drag leading to few land records reforms. Different departments dealing with land records make data extraction too complicated. Misconception of property cards is a major reason behind its failure, whereas 7/12 Abstract is the only authentic document of land rights is a myth. Un-availability of GIS based digital cadastre maps can prove boon to speed up infrastructure projects and faster execution of DPs and TPS. It is the duty and

right of both land holders and the state to guarantee its title so as to avoid future encumbrances. The study of recommendations of LTB-2010 needs proper assessment before the implementation. This study also concludes the challenges such as data mismatch, non-comprehensive ROR's, lack of comprehensive records updation, lack of integrated institutionalization, lack of physical demarcation of internal sub-divisional shares in one survey number which do not reflect in ROR's. Technological transformations, capacity building and lack of protocols could present a seamless land records system.

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Strategy of Inclusive Growth in the Independence Era: A Case of a Model Educational Town of Vallabh Vidyanagar

Vibha Gajjar and Foram Bhavsar

Abstract

This paper is a narration of a progressive development of the model education town of Vallabh Vidyanagar in Gujarat during the independence era. Structural changes in social, political and economic order demanded an innovative model of inclusive growth of rural centres to reduce the migration from rural to urban areas. The paper reviews the vision and strategies formulated and implemented by the visionary leaders of the 1950s for land management and establishment of an educational town. It describes the variables responsible for inclusive growth of the entire Anand region due to multidimensional impact of Vallabh Vidyanagar. It tries to decode various implemented approaches significant in building the town from planning, economic and social development in sync with political and social intentions. Beside various components of the master plan are discussed from macro to micro level with the analytical framework of neighborhood planning.

1. INTRODUCTION

After 1947, Government of India set up the priority of nation building. One of the major concerns was to encourage inclusive growth of rural centres to reduce migration from rural to urban areas. This consideration has been instrumental in laying the path forward for rural uplift. The success of any development model is based on the strategies proposed and implemented during its inception stage. The strategies like providing the planned city fabric with all infrastructure facilities and targeting better living environments. These have shown the holistic approach to development. In order to stop the brain drain and strengthen the rural fabric of independent India, the need for higher education played a pivotal role in the establishment of Vallabh Vidyanagar. During this phase of time, Bhailal Patel, fondly known as Bhaikaka, pioneer in the development of Vidyanagar, along with other forerunners had the vision to develop an educational town in Anand district of Gujarat to accomplish the challenge of making an education available to all. It was influential in bridging the gap between rural-urban divide and serve as a facilitator for promoting quality education. The founding of this knowledge town encouraged the social and economic development of the whole region. It has shown the true spirit of model town development wherein physical development, social consideration and environmental consensus shaped the future growth of the town.

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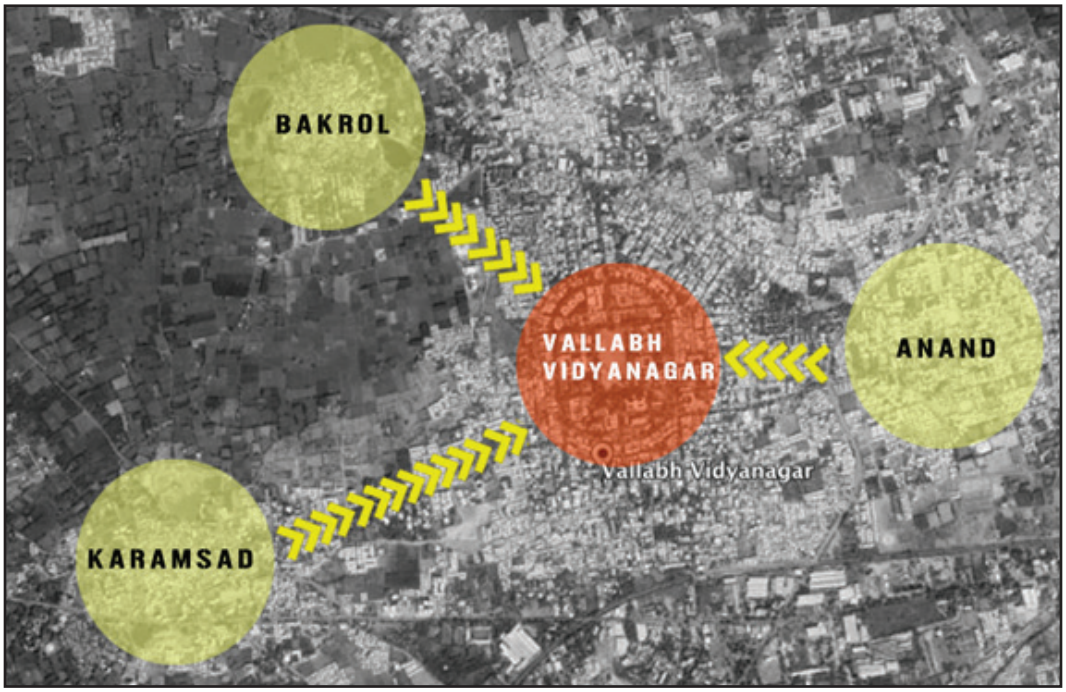
2. VISION OF VALLABH VIDYANAGAR

In August 1942, Mahatma Gandhi and Sardar Vallabhbhai Patel along with thousands of freedom fighters initiated the "Quit India Movement". Bhaikaka, a renowned engineer from Karachi left his job and came back to his hometown in Anand to join the movement. He took up the challenge to contribute to the task of nation-building in his hometown in Anand district. He decided to work for the development of villages and fulfil Sardar Patel's dream of developed and united India. Prior to independence, there were only a few centres for engineering studies in India. Closest to Gujarat was the Poona Engineering College and the engineering college at Karachi. Students from Gujarat were not encouraged to study in Karachi after the separation of Sindh, which left only Poona as a choice for higher studies in engineering. In 1935, Kasturbhai Lalbhai donated generous sum and land to start a new engineering college in Ahmedabad. On one hand, Ahmedabad was becoming the centre for higher studies; the opportunities were lacking in Anand and surrounding areas. It was essential to create centres of learning in the rural areas that were in tune with what was required to promote and sustain rural industries. Anand was predominantly a rich and fertile agricultural area, but deprived in educational facilities. Bhaikaka reflected over a plan that would encourage the intellectual and economic upgradation of rural area. Bhaikaka and his aide set out to establish the University town of Vallabh Vidyanagar. He had with him the ideology of the father of the nation, the great Mahatma Gandhi, together with the able guidance of the Iron-man of India, Sardar Vallabhbhai Patel. He directed the "enlightened self-interest" of the villagers around Anand, towards the formation of an educational town. The enthusiasm, perseverance, and down to earth qualities of Bhaikaka gave him the right approach. In the initial years of establishment, the main focus was to provide the learning environment supported by skill and provision of infrastructure as well as supporting access to facilities for the newly developed educational town. The barren land at the junction of Karamsad, Bakrol, and Anand was chosen to establish Vallabh Vidyanagar. Vallabh Vidyanagar is a synthesis of "Vallabh"- Sardar Patel the man who advocated for the rural uplift and "Vidyanagar" - a place for knowledge.

The first initiative was a creation of "Charutar Vidya Mandal" established in 1945 with a prime focus of rural development. The monetary provision was unavailable from any official authority. The immediate challenge was to find out a way to allocate the appropriate land for the University. The land required for Vidyanagar was acquired through land pooling at the tri-junction of Karamsad, Anand, and Bakrol. There was a direct road connecting Anand – Nadiad and from there to Ahmedabad. The land was barren and was only used as a pedestrian connection between the villages. The insertion of urban infrastructure eventually increased

Fig. 1: Location of Vallabh Vidyanagar – Trijunction and Land Pooling



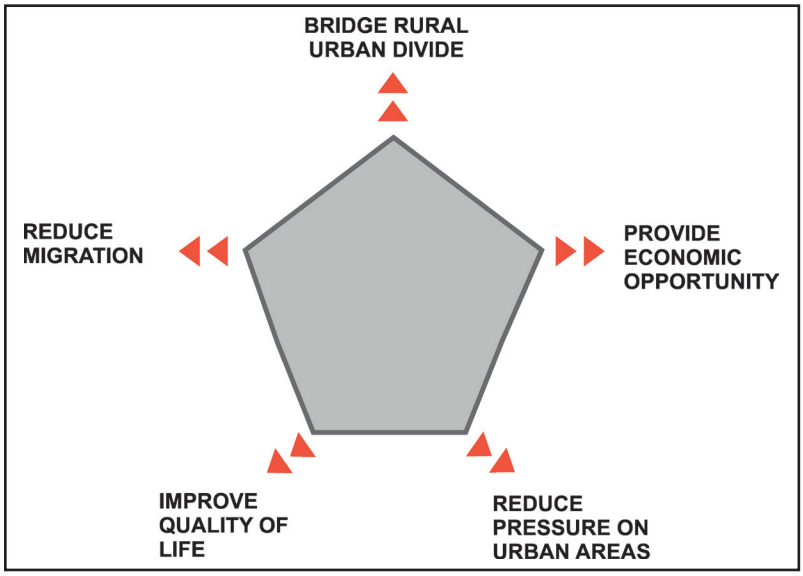
Source: Base Map from Google Earth

the value of the land. The owners who donated the land got high appreciation on their land value after the entire infrastructure was in place. Mahatma Gandhi stated Vidyanagar as "The creation of gold out of dust".

3. THE MASTER PLAN STRATEGY

The master plan strategy was to provide economic growth through employment opportunities, which reduced the pressure of urban areas and decreased the migration. Also, the provision of essential services, health and education improved the quality of life. The availability of education and economic opportunities in rural areas played a crucial role in bridging the gap between the rural and urban divide. The master plan encompasses a growth process that is environment-friendly and community-centric. The major intentions of the master plan are shown in Fig. 2. The master plan of Vallabh Vidyanagar accounts for the future growth framework. This framework provides traffic and pedestrian networks, services, the pattern of land use etc. It also provides options for the future addition of the migrant population. The plan provides solutions for the inadequacy of infrastructure and services generally lacking in the rural areas. It was envisaged to be well connected to the surroundings, green and sustainable in nature and most importantly the model that would be acceptable by the political and government bodies. The macro and micro level aspects of the master plan are discussed further.

Fig. 2: Five Major Intentions of the Master Plan



The overall land distribution was divided in four parts as shown Fig. 3. Larger portion of the land was allocated for the educational institutes. Equal amount of land was given for the residential plots and open spaces along with basic infrastructure facilities. The master plan of Vidyanagar was designed like an oval. The whole town model was based on three basic zoning i.e central open space (playground) surrounded by institutional zone and residential zone. The Shastri Maidan, a central playground acts as a large community open space at a town level. The central oval (approximately 120 acres) consists of educational institutes and amenities such as hostels, staff quarters and students facility area. The residential area in the periphery has large size plots. The main road encircling the oval is 60 feet wide and the internal roads are 30 feet wide.

The construction of the town started in 1945. The first institute set up in Vidyanagar was Vithalbhai Patel Mahavidyalaya, which started functioning from 1947. The central playground was converted into a construction yard where bricks and other building components were produced locally that helped in saving a lot of resources and money for the transportation and material. The opportunity for employment was generated by hiring people from the surrounding areas into construction related activities. The town was generated out of the wilderness. The first plantation was around the central oval - a rectangular playground. The playground is known as Shastri-Maidan today. The playground is used for sports activities, educational fairs, and for large community gatherings. In the second phase, the plantation was enthused around the educational institutes. Over time, various flowering and evergreen trees created the shaded avenues and covered the entire town. as shown in the Fig. 4.

Fig. 3: Land Distribution - Vallabh Vidyanagar

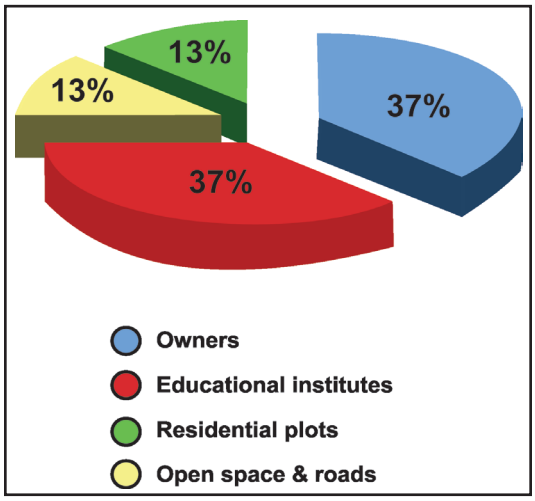
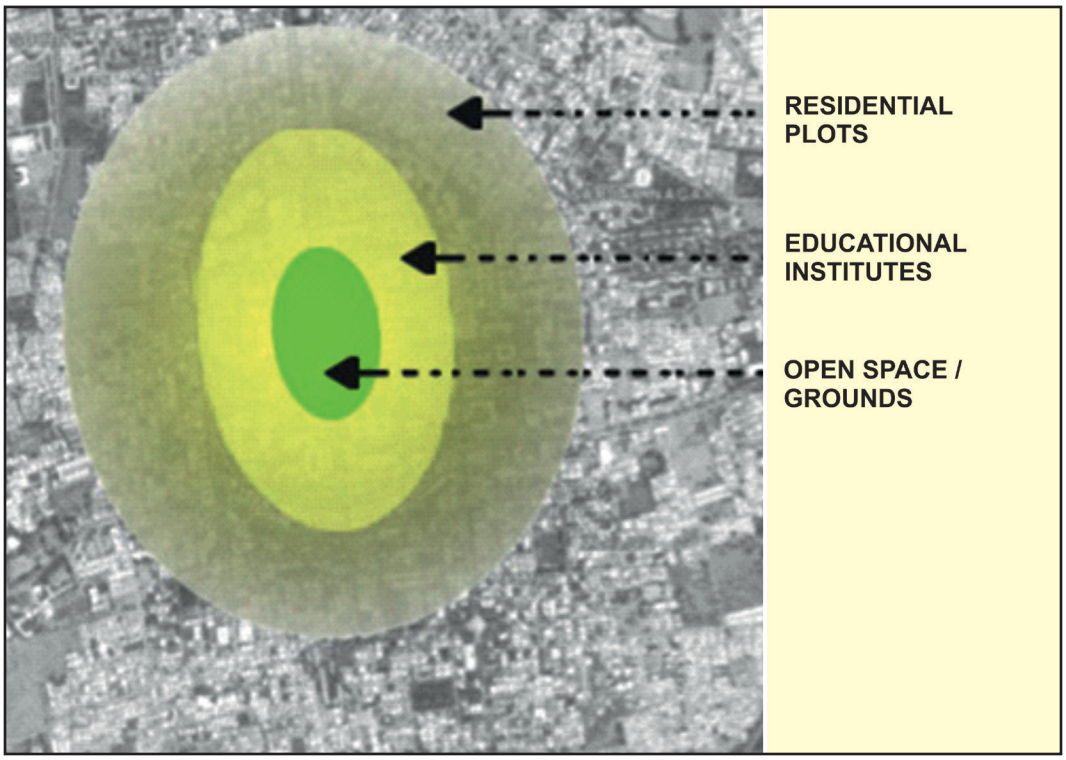


Fig. 4: Oval Ring Master Plan – Vallabh Vidyanagar



Source: Base Map from Google Earth

At micro-level, the master plan of Vidyanagar followed the concept of neighborhood planning. The conversion was happening physically on land and transformation was envisaged socially having a new definition of neighborhood. "Neighborhood" reflects the physical and social aspects of society. The logic of applying neighborhood concept for development of an educational identity has been evident in the case of Vallabh Vidyanagar. From the perception of sociology, neighborhood study focuses on the structure of society and people's interaction. From the perception of urban design and planning, the physical dimensions of neighborhoods are residential units and its interaction with the surrounding. The changing lenses in the definition of the neighborhood are important to study its impact. Through this paper, it is attempted to study the conceptual consideration of neighborhood aspects and its impact in the present time. The concept of neighborhood with respect to its size and design has been an area of interest in many fields from engineering to architecture to planning to infrastructure. Many scholars gave various perspectives on the concept of a neighborhood.

Lewis Mumford defines the function of a neighborhood as "the only functions with respect to which the neighborhood unit is relatively self- contained and is the domestic functions or those activities that spring from them". Le Corbusier

emphasized the use of neighborhood as mechanism giving an edge for the physical welfare. Christopher Alexander looked at neighborhood model from the lenses of the ordering mechanism of the cities. This can facilitate the social framework and subcultures of urban system that helps in the establishment of spatial order.

The neighborhood is an outcome over a period of time and acquires its identity from a continuing relationship between the place and its residents. Three components of a place, a social group, and activities accommodated in the place are important in creating meaning for the neighborhood (Gharai, F. (1999). Generic Principles of Neighborhood Design – with particular reference to Tehran. The University of Sheffield). Neighborhoods were formed, progressed and manifested throughout history. However, the concept of the neighborhood has been explored in the planning mechanism in many ways. Due to its diverse approaches and its versatile usage, the concept of the neighborhood has clarified its multidimensional nature. Both physical and social aspects of the neighborhood were subject to investigation from a very sensitive and functional view, to a more essential and conceptual one.

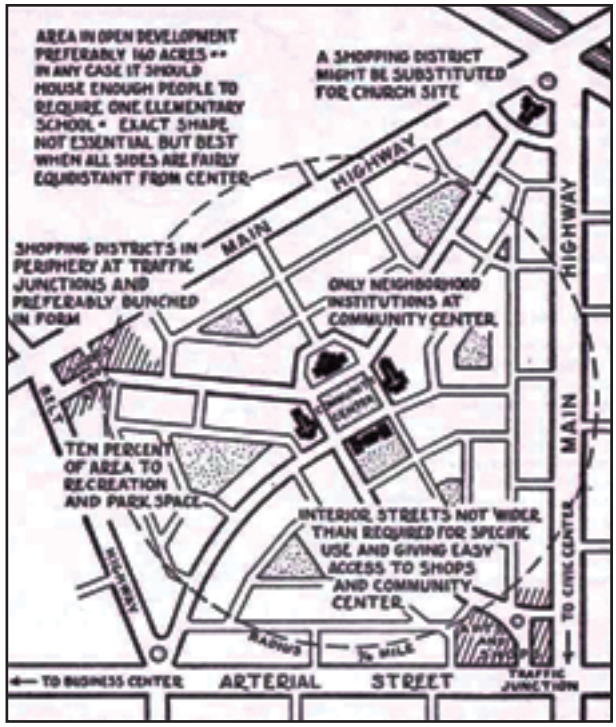
Some of the major discussion in the literature on the planning of new towns and neighborhood design brings major issues like-lack of social interaction, sense of community and security, environmental degradation, increasing level of pollution, health hazards, etc. Such types of issues raise an alarm towards an approach of designing walkable or pedestrianized neighborhoods, mix-use development, minimum interventions, and many more consensus. The choice of addressing these problems as conscious decision results in positive return in planning. Through this paper, some of the interventions, which are instrumental in positive results are analyzed. Besides good planning and design decisions, the application of these interventions, opportunities to local society and economy played a major role in the dynamics of present-day educational town.

The decision and consideration for developing an identity for any new center are largely dependent on the choice of model opted for land-use planning and development. The decision of developing an educational town for social and economic development created the identity of Vidyanagar as “knowledge Centre”. In the case of development of the new educational town, the basis of the neighborhood played a key role. The villages have a strong sense of community and cultural identity. The interaction between the inhabitants and the built environment was very carefully crafted. A neighborhood planning approach of Vidyanagar puts urban design and place-making principles at the heart of the process.

Lewis Mumford stated the origin of the neighborhood based on natural behavior whereby people coming together and settling at a place with sharing of

common facilities. The neighborhood unit as a planning concept took a forward stage when the development took a U-turn and ignored the environmental concern in the early 1900s. One of the earliest authors to attempt a definition of the 'neighborhood unit' in specific terms was Clarence Arthur Perry (1872-1944), a New York planner. Perry's neighborhood unit concept began as a means of insulating the community from the ill-effects of flourishing vehicular traffic as shown in Fig. 5. However, it evolved to serve a much broader purpose of providing a discernible identity for the concept of the neighborhood, and of offering to designers a framework for disseminating the city into smaller subareas (Meenakshi, 2011 Neighborhood Unit and its Conceptualization in the Contemporary Urban Context. [online]. Available from: Institute of Town Planners. Journal 8. PP. - 82). The concept of neighborhood unit in traditionally built environments and rural settlements constituted a strong sense of attachment, identity, admittance and belonging for inhabitants.

Fig. 5: Neighborhood Unit by Perry



Source: A diagram of Clarence Perry's neighborhood unit, illustrating the spatiality of the core principles of the concept by Arthur Perry (1872-1944)

Neighborhood concept plan helps in the preparation of a neighborhood level land-use plan for new developments in an inclusive manner. It takes into consideration the existing land uses, densities, transportation network, parks system, and community facilities intended for a neighborhood as it grows. The concept of neighborhood planning has many advantages and if it is included during the inception phase of development it results in better returns. Great neighborhoods don't happen by accident (Director of Planning Services. The city of Red Deer, 2013. Neighborhood Planning and Design Standard: city council. Canada). They are the result of careful planning and thoughtful design that creates places that are sustainable, walkable, vibrant, social, and liveable which increase the quality of life for residents of all ages and incomes. Along with Perry, UN-Habitat describes five principles as the strategy of sustainable neighborhood planning. The Master Plan for Vidyanagar considers the following principles for the inclusive development of the neighborhood, which takes into consideration various theories of good neighborhood planning.

5. WALKABILITY AND CONNECTIVITY

One of the key principles promoted by the UN-Habitat is to foster sustainable urban development by creating livable and efficient neighborhoods wherein walkability and connectivity are very vital. Walkability provides many benefits related to health, environment, and economy. Factors influencing walkability include the presence or absence and quality of footpaths, sidewalks or other pedestrian rights-of-way, traffic and road conditions, land use patterns, building accessibility, and safety, among others (Walkability Improvements, Victoria Transport Policy Improvements. Available online at: http://www.vtpi.org/tdm/tdm92, Accessed 8th October 2018). The present condition of Vallabh Vidyanagar town provides an opportunity for walkability from such factors. The overall layout of city planning offers the users to reach from one place to another within 25 to 30 minutes as the total geographical area of Vallabh Vidyanagar municipality is 2.3 sq km.

Walkability promotes the reduction of vehicular movement and encourages the pedestrian movement thus providing vibrancy to healthier living standard. Issues related to air, noise or any other pollution is automatically addressed by more walk and less drive. The avenue of trees further enhances the walkability in the shades even during the harsh sunlight hours. Most of the amenities are available within a walking distance of 10 minutes from home as well as the educational building. The earlier network of the road did not have the clear demarcation of footpath but with the passage of time and due to the increase in vehicular population, the clear walking pathways are created in the town. So, one can say that it is a pedestrian-friendly street and promotes walkability.

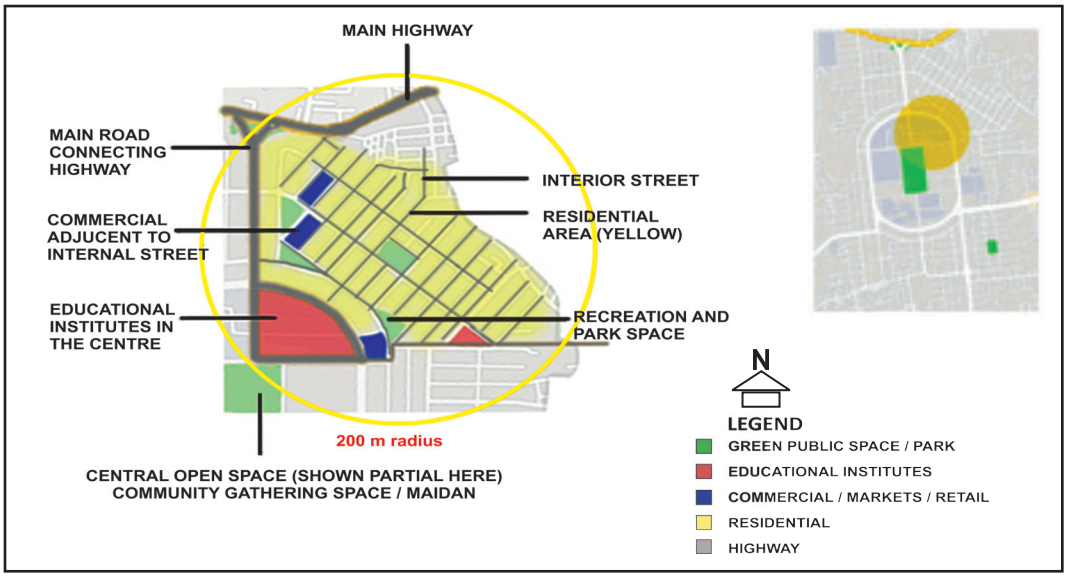
Connectivity affects the degree to which transportation networks such as streets, walking, etc. connect the people to their destinations (including intermediate destinations such as public transport services), (Design Principle-Connectivity and Permeability, Healthy Spaces & Places 2009. Available online at: http://www.healthyplaces.org.au, Accessed 16th October 2018). One of the ways of understanding the better connectivity is through an understanding of ped-shed or simply pedestrian catchment area. The pedestrian catchment as shown in Fig. 6 of two different types of street network referred to as ped-shed. The two diagrams show a ten minute (800 meters) pedestrian catchment having a well-connected street network and less connected street network. Both types have merits and demerits but one having better connectivity shows better channelization of movement as adopted in case of Vallabh Vidyanagar and shown in Fig. 7.

The plan of Vallabh Vidyanagar as shown in Fig. 8 consists of a central oval space, having the large open area surrounded by institutions, staff quarters, hostels and

Fig. 6: 800 m Radius Walk in a Compact and in a Sprawling Suburb Neighborhood

Source: Map courtesy of Lawrence Frank & Co. and the Sightline Institute

Fig. 7: 200 m Radius Walk in a Compact Neighborhood



Source: Base map from Google Earth

the University. A 60 feet (18 meters) wide road encircles the oval. The peripheral area is divided into plots of regular sizes for residential purpose. The roads in the residential areas are 30 feet wide. The grid pattern allows the dispersion of traffic as well as ease in traffic movement. The city consists of primary and secondary road whereby major traffic movement of public transportation of bus is restricted in the primary road. The private vehicular movement can easily flow into secondary roads. As it is mainly developed facilitating pedestrian movement, the vehicular volume of traffic faces a challenge regarding the pace of movement. The speed of the vehicular movement is automatically restricted as

Fig. 8: Road Network and Green Avenues- Vallabh Vidyanagar

at every cross junction the vehicular movement from other direction is approaching the same junction. One can say that town design has offered a better connectivity, which provided a vibrant and healthier living environment. Even the resultant effect of the planning of Vallabh Vidyanagar can be summarized as Increased connectivity (combined with increased density, mixed-use planning, and good urban design) = increased walkability = better health. The city is well connected with nearby urbanized center Anand at a distance of 6 km, having transportation facility of Rail as well as State Bus service. The internal city transportation became recently operational by private transporter providing a circular route service within and in between cities.

5. MIXED USE AND DIVERSITY

According to UN-Habitat "The purpose of mixed land use is to create jobs, promote the local economy, reduce car dependency, encourage pedestrian, reduce landscape fragmentation and provide closer public services and support for mixed communities". Mixed land use is also an essential concept of new urbanism. Vidyanagar has a combination of residential, commercial, industrial and office use activities as a part of various zones rather than having a single-use zoning. Though, educational institutes are allocated in a single zone, all the other related activities and residences take place around the University area. The town consists of private plots as well as university staff quarters which allows a range of public as well as private development. The town comprises of various sizes of housing units allocated to the university staff starting from the professors to the peon quarters. The residential fabric has the provision of spaces for commercial activities. There are two main markets in the town, "nana bazar" and "mota bazar" positioned at two diagonal locations. They largely cater to the commercial needs of the town and neighboring towns. Currently a number of malls and shopping centers have come up in the vicinity of both the bazaars. Most of the city population is directly or indirectly involved in Educational Institutes ranging from academic, administrative to support staff activity. The location of Industrial estate Vithal Udyog Nagar (GIDC) and AMUL are within the 15 km radius of the town. The presence of industrial and cooperative facility has given varied opportunities to residents of Vallabh Vidyanagar. These industrial developments

promote the residential development and Vidyanagar fulfills the residential demand for a comfortable living environment. The pollution free environment with an adequate amount of parks and playgrounds allow enjoyment for different age groups. The diversity of population gives rise to inclusive culture. The town is the synthesis of varied cultures, which enable it to evolve and expand the quality of life, as well as to foster an environment of creativity amongst the students and citizens (Sophisticated Instrumentation Centre for Applied Research and Testing – SICART. 2016. Available online, at: http://www.sicart.res.in/vvn.aspx, Accessed 15th September 2018). The establishment of Vallabh Vidyanagar has converted the complete dynamics of the area from barren land to a thriving educational hub. It has the unique blend of both facilities of a big city and simplicity of a small town.

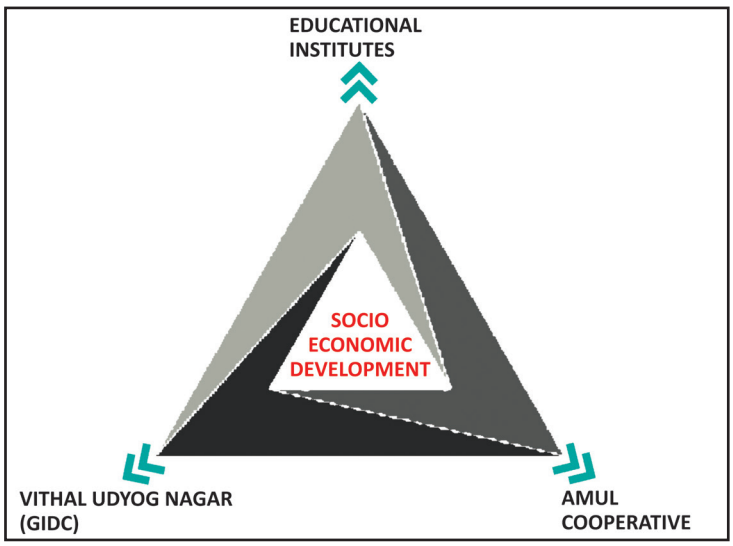
Vidyanagar is considered as one of Gujarat's greenest town. It has more than 80 species of trees planted on the roadside; it has perhaps the highest varieties of trees in the state of Gujarat in such a small area. It shows the richness of diversity which is one of the aspects in keeping the ecology as an integral part of the city. The town has the largest colony (habitat) of rose-ringed parakeet; the last count was in 2003-4 was of more than 63,000 parakeets ("Vidyanagar Nature club". 2013. Available online, at: http://www.vncindia.org. Accessed 23rd September 2018). The uniqueness of the development not only preserved natural habitation of other species but also promoted the better living standard for the habitation of a new community. The development promoted the presence of flora and fauna and natural ecosystem intact and enriched the living experience of the entire habitat. The ratio of built verses open with full-grown tree avenues on either side of roads or other green area keeps the environment pollution free. The presence of different varieties of trees has added value addition to the living environment by creating serene and tranquil atmosphere. The presence of green scape is fundamental in keeping the temperature cool as well as pollution free environment.

6. SOCIO-ECONOMIC DEVELOPMENT

The post-independence challenge in front of India was to protect the villages and avoid rapid migration from rural to urban areas. The way to stop the spatial migration from rural to urban was to improve the rural areas by providing new opportunities. Social and economic development is the true engine of survival and growth. The development of educational institutes served for the educational opportunities to the surrounding rural areas but the only educational establishment was not enough to stop the rural migration. Bhaikaka 's comprehensive approach towards the planning of Vidyanagar promised the employment opportunity for the rural areas.

Vidyanagar was developed as a real center of development creating multiple possibilities of jobs as well as social wellbeing of the residents by providing them economic growth, a higher level of education, good healthcare facilities and better services in the town. Educational institutes of Vidyanagar and dairy development of Amul in Anand helped in transforming the socio-economic dynamic and development of the whole district. Various educational institutes in the town encouraged related businesses to flourish. Students living in the town required basic amenities such as hostels, tiffin services, food joints, grocery shops etc. for their daily activities. The small-scale industries found plentiful opportunities to do business in Vidyanagar. The intellectual class started migrating to the town in search of the reputed jobs in the educational sector. Soon, it became the major center for education in Gujarat. Not only locals but also outsiders were encouraged to make this green town their hometown. The cosmopolitan population added cultural diversity and value to the society. Along with education, the Kaira District Co-operative Milk Producers' Union Ltd., was founded in Anand in 1946, which was subsequently followed by Amul. Today, Amul is Asia's largest milk producing co-operative company. Amul demonstrated a model of the self-distributing agro-based system, which harnesses existing market forces. National dairy development board (NDDB) established in 1965 initiated milk marketing for dairy development. NDDB is a learning module all around the world for dairy development, especially in developing countries. NDDB eventually took over the oilseed cooperative as well as salt farmer's society. These establishments have played a pivotal role in the economic uplift of the region, especially the rural population. The establishment of Vithal Udyognagar developed as another organization providing employment to the graduates from Vidyanagar as well as the people from surrounding villages as workers and administrators.

Fig. 9: Social and Economic Development



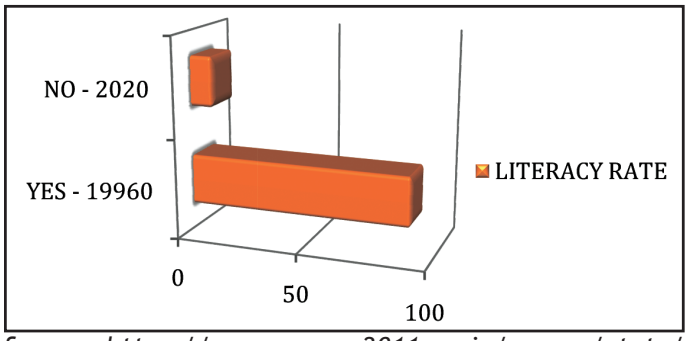
Vidyanagar was benefitted the most, as it became the evident choice for the people to settle down. Eventually, Vidyanagar became the nucleus of the region for education and employment. Hence, the social, as well as economic development, contributed in uplifting the rural areas in its true sense.

Impact of education on socio-economic development is apparent.

The territorial impact of higher education institutes is undeniable. Education has a pivotal role in social development as well as the territorial /regional/ national economy. Educational institutes have its outreach in private and public sector. The interaction of various organizations with the local, regional and national government as well as non-government organizations gave rise to the development of socio-economic dynamics. The gravitational effects that the presence of an educational institution has in a territory, mainly related with the rejuvenation of the population through the attraction, each new academic year, of new young students and, afterward, at the end of the training period by the fixation of new permanent residents. These economic and cultural dynamics transform the territorial DNA. The activity of an institution transforms the social biorhythm, the cultural DNA, and the economic pulsation of a territory (Saúde , S., Borralho, C., Feria, I. and Lopes, S., 2015. The impact of Higher Education on socioeconomic and development dynamics: lessons from six study cases. Available online from: Investigaciones de Economia de la Educacion. Volume10. pp. 888-905). With a small strength of 573 (approximately) students in 1947, it has grown to more than 30,000 (approximately) students in 2017 clearly indicating the impact of the educational hub in 60 years of its establishment. The increase in student strength directly affects the socio-economic dynamic and development. Sardar Patel University is one of Vidyanagar's oldest Universities. Today it has more than 24 postgraduate programs with various graduate courses. Vallabh Vidyanagar has a great degree of influence in the economic and social uplifting of the region. The social and economic impacts are as follows:

- The total population of Vidyanagar has reached 23,783 in 2011 with 12111 male and 11,672 female from 21,560 in 2001. Though, there has been a decline in population growth after 2011 due to more and more institutes coming up in each town and city. This proves that educational institutes are the biggest attractors for population growth. The ratio of male and female in Vidyanagar is close to 50 per cent with 50.9 per cent men and 49.1 per cent female. Due to the educational institutes, the town has attracted educated class in search of jobs or businesses. The students, who finished their degrees from Vidyanagar, found a job opportunity in the town itself and settled there.
- People in search of a serene environment found their peace at Vidyanagar amidst the pollution free green environment.
- Unlike the rural areas, people who settled down in Vidyanagar had smaller families with less number of members in the family. It gave rise to a new type of household, which is a balanced mix of urban and rural characteristics.

Fig. 10: Literacy Rate

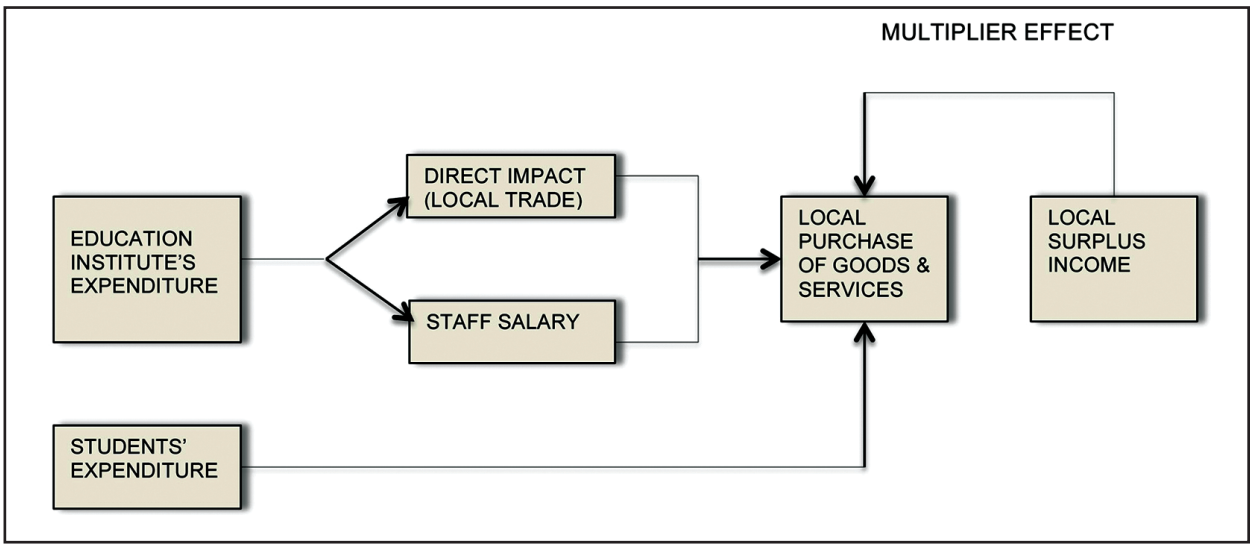


Source: https://www.census2011.co.in/census/state/gujarat.html

They are sensitive towards nature as well as well-educated and have a broader world view like the urbanized community.

- The literacy rate in the town as shown in Fig. 10 is very high. It created balance in the domestic relationship by providing opportunities for the women to work and prosper. The literacy rate for women in 2011 is 86.8 per cent. Women are empowered in the town as they were easily employed. Various Gruh Udyog and NGOs hired women employees. It is also providing a platform and opportunities for skill-based talent within women. They are absorbed in activities like Masala (spices) Udyog, pickle making, seasonal snacks, etc.
- With the rise in population, the demand for the daily needs increased resulting in the opening of new opportunities in various fields. Varieties of businesses flourished to match the supply with the demand. Local authorities and enterprises are benefitted from the expenditure flow of the institutes by means of faculty, staff, students, and visitors.
- Along with education institutes, various commercial businesses developed in Vidyanagar, which generated cash flow and revenue for the city to function and grow. The important agents generating the cash flow are students, faculties, researchers, and visitors through their expenditure for daily activities. These expenditures directly or indirectly influence the economic flow of the territory.
- The population rise in the town demanded the growth of infrastructure facilities and amenities.
- The development and diversification of commercial and educational activities created new jobs for people living in the town. Development of infrastructure generated work opportunities for the people.
- The basic facilities such as a library, amphitheater, gallery, playground, and laboratories give rise to research and collaborations with regional and local enterprises/ventures/businesses. Various companies started coming to the town to easily find educated employees for their job profiles.
- Various places for entertainment and cultural activities such as theatres, amphitheaters, malls, cafes, exhibitions, restaurants, halls etc. started populating the town.

Fig. 11: Dynamics of Economic Impact



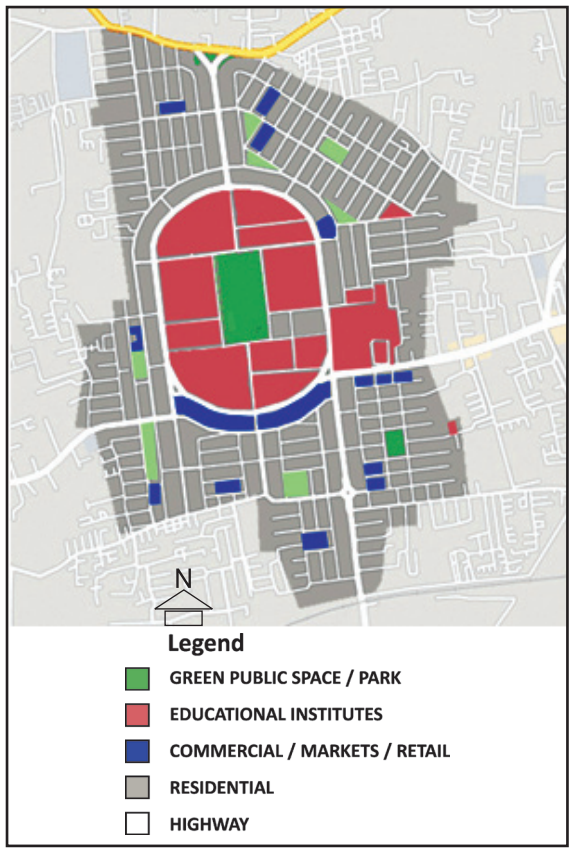
Source: Adapted from Ryan and Malgieri, 1992.

- Healthcare related facilities started coming up which could cater to the whole district. Vidyanagar became an attractive location for the hospitals due to its infrastructure and facilities at par with urban areas. Vidyanagar has more than 17 hospitals with advanced facilities and equipment.

Over the period of time, Vidyanagar became an obvious choice for educated people to have the simplicity of rural life and high living standards with urban facilities. The overall economic impact of educational institutes can be understood better from Fig. 11.

One of the ways for the rural uplift is to organize the local existing small-scale enterprises into a larger cooperative. It is persuasive to consider the socioeconomic model of cooperatives that offer inclusive, reasonable and sustainable enterprise. In developing countries like India, Cooperatives provide a unique model for economic development. As every individual working for the cooperative has benefitted in a much larger way than from independent

Fig. 12: Land-Use Plan of Vallabh Vidyanagar



Source: Base map from Google Earth

enterprises. In these enterprises, the needs of members and its expression through voice and participation in decision making is paramount (Ghosh, A. 2013, 'Embeddedness and the Dynamics of Growth: The Case of Amul Cooperative, India'. UNRISD Conference - Potential and Limits of Social and Solidarity Economy. Geneva, Switzerland). The stakeholders share a multi-faceted relationship with their organization because they themselves act as owners and vendors for daily consumption. The Kaira District Co-operative Milk Producers' Union Ltd. was formed by a handful of dairy producers just prior to India's independence. It was later on recognized as Amul. Amul was established in December 1946 as a district milk producers' union of two village milk cooperative societies. Amul is one of India's most famous national brands and competes successfully with larger dairy multinationals. Amul is an ideal cooperative which is rooted in the context and community of a region. NDDB (National Dairy Development Board) was established in 1965 which believed the rural development to be the key of nations socio-economic progress. The Dairy Board was created to promote, finance and support producer-owned and controlled organizations. NDDB's programs and activities seek to strengthen farmer cooperatives and support national policies that are favorable to the growth of such institutions. Fundamental to NDDB's efforts are cooperative principles and cooperative strategies. These two developments benefitted in the economic and social development of Anand district (National Dairy Development Board. 2017. Available online at: https://www.nddb.coop/, Accessed 19th and 23rd August 2018).

Vallabh Vidyanagar provided educated employees for these two organizations. Related courses were introduced in Vidyanagar institutes for students to get job opportunities with NDDB and AMUL. The engineering students from Birla Vishwakarma Engineering college were also recruited in these organizations during placements.

The milk farmers became stakeholders in the cooperative and earned a fair price for their product without exploitation. Apart from the educated class, Vidyanagar partially provided for the workforce required for the functioning of these two bodies. There are around 8-10 per cent people employed in agriculture and cultivation activities. 5 per cent of the population is working as agriculture labors or marginal workers. (Derived from Census 2011).

The advanced machinery equipment required for the dairy were manufactured in and around Vidyanagar. The development of small-scale industries in vicinity facilitated the immediate needs of machinery requirements of the dairy industry. Within a short period of time, the educational hub also provided the qualified technical staff which boosted further establishment of Vithal Udyognagar (GIDC).

An industrial set up near educational center provided a better linkage between theoretical learning and practical solutions for all the stakeholders. Students got the benefit of practical learning and industry could feed the knowledge required thus by reducing the existing gap between profession and practice. Along with Amul, Agro-Economic Research Centre (AERC) was established in 1961 by Ministry of Agriculture and Farmers welfare, the government of India at Sardar Patel University in Vidyanagar. The mission of AERC is a regeneration of the rural Indian life with the application of the study and research in all the disciplines of knowledge in tune with modern global developments (Sardar Patel University. 2018. Available online at: https://www.spuvvn.edu/about/history/, Accessed 30th August 2018).

The educational township of Vallabh Vidyanagar was established in 1955. Vithal Udyog nagar an industrial estate is situated between Vallabh Vidyanagar and New Vallabh Vidyanagar (In Charotar district). The estate has almost all types of Industries contributing to the growth and development of the district. Vithal Udyog Nagar was developed in 1963 by Shri H.M. Patel, former finance and home minister of India. The educational institutes were established under Charutar Vidya Mandal founded in 1945. The Late Shri Bhaikaka in 1958-59; realized that youth of Charotar would continue to migrate, a few years later on graduation to cities in search of jobs. Thus, he planned to establish an industrial estate near the township of Vallabh Vidyanagar. It was named after Sardar Vallabh Bhai Patel's elder brother Vithalbhai Patel. A leading industrialist from Mumbai and other parts of India were invited to set up the industries with assured help in providing basic infrastructure, land, power, and water. Various large industrial groups such as Elecon Engineering Company, Vallabh glass works, Gujarat manufacturing company established their units in Vithal Udyog nagar. GIDC was developed after the formation of the state Gujarat in 1960, which took over the works of an industrial area. Total Plot area of Vitha Udyog nagar is 232.36 hector out of which 193.39 hector area is already developed with the industries and related amenities. Vithal Udyog nagar Industries Association (VUIA) established in 1970 plays a proactive role in the inclusive and sustainable growth of the industry (Shodhganga Inflibnet. 2018. Role of Industrial Development. Available online at: http://shodhganga.inflibnet.ac.in/, Accessed 11th September 2018).

Industries in small sectors like Vidyanagar played a vital role in economic development. Enhancement in industrial productivity at large benefits the industry and society.

- The population of Vithal Udyognagar has reached 5000 since its inception in 1963. (Derived from Census 1991, 2001 and 2011). This indicates that people

working in Vithal Udyognagar prefer to stay in Vidyanagar which over time contributed to its economic growth.

- The inception of Vithal Udyognagar promoted many related institutes to complement the related education. Students graduating from institutes were given job training and placements in this organization. It generated employment possibilities for the youth graduating from Vallabh Vidyanagar.
- Labor forces and unemployed illiterate people from the surrounding villages were employed in the industries for labor jobs.

A symbiotic relationship of this three nucleus (Institutes at Vidyanagar, Amul, and GIDC) benefits each other for the inclusive growth of the entire district.

7. CONCLUSIONS

An ultimate goal of any development process aims at seeking an alternative means to achieve a balanced growth. The scale and magnitude can alter resultant effects towards planned growth or haphazard development. If one seeks better solutions for achieving balanced growth at a neighborhood scale, the principal considered becomes a major driver for its resultant effect. The concept of neighborhood planning and its understanding offers a wide range of appropriate solutions if considered during the phase of development of the city. The accelerated urbanization in present times raises issues to manifold to supply the basic need to the city be it physical, social, economic or infrastructure facilities. Besides providing an appropriate and balanced growth of a city the application neighborhood principals has played a major role in the sustenance of Educational center known as Vallabh Vidyanagar. The vision with which it was developed during the era of Independence and still continues to provide an identity as an educational center remains a matter of study. Through this paper, an attempt was mode to study the physical, social and economic aspect of the city of Vallabh Vidyanagar, which has proved to be a model town. The establishment of the educational center not only uplifted the living standard of the city but also created an identity for its future generations over a period of 65 years. This is an attempt to study the of the existence of educational town which started as a need of the society but still continues to attract the people and sustain as a strong pillar of society. Usually, the cyclic process of the city from its birth to decay over a period of time is a common phenomenon. The model of this educational center has remained a major attraction even today. The city has provided equal opportunity to the residential population as well as the floating population for providing a better living environment. One can say that the model town whose intentions as an educational center remained unharmed even with the process of urbanization needs an appreciation from a planning perspective.

With the passage of time, it has remained rooted in rural fabric and to match with the pace of urbanization, it provided all the facilities from the social, economic and physical perspective. The opportunities provided to a rural population have resulted in up gradation of societies not just at the local level but to a regional and state level. In addition to its basic mission of providing higher education, training and research the Vallabh Vidyanagar have created an impact in many ways. It opened up an avenue of getting absorbed in nearby industries or carry forward research in dairy technology and agricultural segment. The academic atmosphere of Vallabh Vidyanagar and balanced growth from the socio-economic and environmental perspective the city has shown one of the best models of development to look upon.

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