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Urban land monitoring issues in Mumbai –Pune urban corridor of India

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ABSTRACT

The land is basically use for agricultural and non agricultural use. The population of country is high causing tremendous pressure on land. The urban triangle of Mumbai Pune Nasik is developing fast with number of issues amounting to wastage of land. The present paper has focused to use minimum land for non-agricultural uses like buildings, roads, un-authorized constructions, barren lands. This paper has suggested the mechanism monitor land use in systematic way. The paper explains the land use pattern of developed country like Singapore and compared with India. Considering the fast growth of urban population in present triangle under study, paper has suggested measures to mange land use in the urban area. The paper concludes, in the era of digitalization the land use should be monitored as per the area of each land parcel with population, open space and other civic amenities. The transport arrangement should be designed considering peak time. The paper suggests recommendation for better land management.

Introduction

The main source of lively hood to most of Indian population is agriculture. The urban population in India is increasing fast, due to which the agriculture land is converted to non-agricultural use. The land use in the urban area is controlled by the planning authority under the law. The urban parts of nation are having Municipal Corporation, and cantonment board as planning authority under the control of urban development department of state government. The rate of growth of urbanization is fast in Pune Mumbai and Nasik triangle; hence some more planning authorities such as MMRDA, CIDCO, PMRDA, and MSRDC and Collector are working as planning authority for area, which is having major urban potential to convert such land for urban use. The land prices are rising up very fast and most of rich and middle-class population are investing in land for future investment or land value appreciation. The investors are not using land for NA use within stipulated time period under legal provisions. The lands are kept uncultivated and barren for years and years. The land use or sale happens only after the actual market demands. The urban land use is never restricted by government authorities, but regularization as per law is not done in many cases. If the land use is verified with satellite imaging, it is seen that many lands in the authority of urban zone are barren for many years. These barren lands attract the provisions of resuming of such land to government due to non cultivation for food production as per Maharashtra land Revenue Code 1966.The basic land principal is that that are used basically for agricultural use, hence no land can be purchased for agricultural use other than farmers. In spite of this provision thousands acres of lands are barren or without cultivation in outskirts of Indian cities. The lower percentage of profit in farming or loss in crops has resulted many lands barren for many years. The urban land management is serious issues, village like Mundva in Pune Municipal Corporation was included in corporation limit by 1949 and some part of village is cultivating cash crops like sugarcane in 2018. The example clearly shows the

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miss-management of urban lands. The research paper explains the better management of lands in city and urban area.

The population trend of Maharashtra is shown in the Table below. The figure shows the urbanization of Maharashtra is 54.78% which is very high. The highest decadal growth in 2011 census in population has been recorded in Thane (36.01%), followed by Pune (30.4%) which shows the urbanization is growing very fast. The data shows that in Maharashtra more than half population resides in the city .Hence land use in the city needs to monitor very strictly, with per the principle of

SR no	Population	Population as per 2011 census	Population as per 2001 census	Percentage growth
1	Total Population of Maharashtra	(Million) 112.37	96.9	15.99
2	Maharashtra Rural Population of Maharashtra	(Million) 61.55	55.73	10.46
3	Urban Population of Maharashtra	(Million) 50.82	41.01	23.64
4	Urban Population of Urban Population of Mumbai	(Million) 18.41	16.55	14
5	Urban Population of Pune	(Million) 5.05	3.756	34
6	Urban Population of Nasik	(Million) 1.56	1.125	36

minimum land requirement for urban use.

Urban and rural Population of Maharashtra

Source-Census data of India 2001-2011

The research paper is divided into following parts –

1- **Agricultural lands**

2- **land use pattern in India**

3- **Comparison with other developed countries like Singapore**

4- **Major findings of land use in area under study -Problems identified**

5- **Recommendations**

1. Agricultural lands

The lands are basically used for agricultural purpose. These purposes consist of lands under food production for various crops and the tree plantation like horticulture and fruit gardens. The other agriculture use is for animal grazing like small herbs and grass. The most important other agricultural uses are forest and wildlife. The area which is not used for non-agriculture is generally called as agricultural. The United Nations is also studding for good management of agricultural lands for the member nations through its organization called FAO.**The FAO definition of sustainable agricultural development is "the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. This development conserves land, water, plant and animal genetic resources which environmentally non-degrading, technically appropriate, economically viable and socially acceptable."**The above definition clearly shows that the agricultural is nothing but preservation of bio diversity of

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land, water, plant, animal with genetic reference**.** The urban land uses in many part of world consist of lands use which is not for agriculture use. The land requirement for city use such as constrictions, city amenities under development plan like roads, garden, playgrounds, burial grounds, schools, or any other use which is not comes under agriculture definition is called non agriculture use. The city lands in municipal corporations, cantonment boards, lands under commercial and industrial use considered the land use as urban use or land use for urbanization.

2. Land use pattern in India

The main land use in any nation is built-up on land includes dense, moderate, sparse as well as rural settlements, industrial, institutional, commercial, recreational, transportation and utilities, agricultural land which includes cropland, fallow land, tree plantation, forest, scrub ,green cover, wasteland, water logged, hills, barren land and rocks, water bodies river, tank, lake etc. The urban built-up residential area is always classified into dense, moderate residential area, the slums, planned layout ,residential layouts ,open space, commercial industrial, transportation railways ,main roads ,national highway and others roads, recreational parks or gardens, playgrounds, stadium ,institutional, golf course services, railway station, police station, post office and telegraph office, hospital, wireless station. The green uses in urban areas are agricultural land, cropland, fallow land, plantation wastelands, scrub land forest, water logged, hills, barren rock, trees, green cover, water bodies, river streams, rural tanks, ponds etc. **The major problems of urbanization in India are urban sprawl, overcrowding in city area due high density, shortage for housing due to high value of lands, unemployment to the youth due to migration to cities for jobs, slums and squatter settlements ,most of them are unauthorized and not suitable for living conditions, the problems for transports like crowded local rails in Mumbai due to extreme pressure, shortage of water due to increasing population , sewerage and issues relation to solid waste management ,increasing number of civil and criminal crime with many other problems of urban pollution.**

The current process of land use has come up with large number of problems like slums, unauthorized development, encroachments, lack of basic amenities, shortage of roads and public transports, polluted of water and air in the cities. Sewage disposal and waste management issues, water shortage to masses in the city, lack of sufficient dams for storage of water to city, unused and barren land in the city without any use, minimum land use for maximum people is neglected concept in the town planning regulation. Cities are planned on old concept with easy conversion of agricultural land for urban use. No planned land use considering future shortage of land is ever part of town planning in India. Such non planned urban planning has came up with shortage of land for basic amenities like garden, railway track, roads ,dumping grounds for waste managing has resulted in polluting and hazardous cities.

3. Comparison with other developed countries like Singapore

The area of Singapore is very small, the area of India is more almost 4300 times than Singapore. The land use planning of this small country is perfectly planned. The Singapore land use plan for 2019 most of the land is used for environment, tourism and commercial, residence purpose as per the need of country. The land use of the country is planned with single house with the class of citizen with respect to income group. The land use is planned as per the main uses like Housing, Commerce, Industry ,Parks, Community, Institution, Sports &,Recreation Infrastructure & utilities, roads, others uses like undeveloped land, reservoirs, cemeteries. Due to limited area the land, government is struggling to reclaim 10 hectors of land from sea. The planning of this 10 acre is already done for housing considering growth of next 20 years. The country like Singapore is planning for house hold

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considering the density and income group and other factors for household. The figures for the country as per housing policy, It is seen that they managed every single dwelling house is monitored as per the national plan. If planners consider the land use plan of India with the Singapore, it is confirmed that large volume of land is vested for unauthorized use like slums, construction, barren lands etc. Singapore has well managed every land parcel is for specific land use. The land is costly in Singapore, or more clearly it is rare, hence need is calculated as per population, economy, planning, actual need of citizen, development work and class of citizen with density of population in area and traffic management and many other important factors.

4. Major findings of land use in area under study -

1. The built up for residential and commercial area is the main urban land use. The administration manages this development with the help of zones of land use in town planning. The planning authorities like municipal corporation in Mumbai ,Pune, Thane, New Mumbai, Nasik etc has planned large number of land parcels in the residential and other zones for the building use. The land values in Mumbai city are even up to 100000 rupees per square feet, Pune in range of 2000 - 20000.The era of digitalization provides number of technologies to monitor the land use, and still urban development department only projects the population for next 20-30 years. The growth in population is measured once in 10 years with census. The state or local administration doesn't have any mechanism for occupancy mechanism in particular land parcel. The lack of this mechanism has resulted in loss of huge urban land with loss of million rupees. The current land use pattern in urban area does not have any control on utilization of urban lands, which is causing huge financial loss to the urban bodies. If the same is monitored with the help of FSI and population it will increase income to urban bodies 10 times in case of properly tax. The population of Pune city if provided a water of 155 liters per day, the requirement is 9 TMC, but actual supply from the khadakwasala dam is 17 TMC. The above example shows the national loss of natural sources like water with sanitation issues. The excess water in the cities has polluted rivers with contamination of water causing biodiversity loss and survival problems of animals and bird species. The special Township like Magarpatta is paying annual property tax of 25 Crores per annum for 173 hectors, then PMC should get property tax of 600 million rupees, it is 59 million as per their budget. The figures may change to some extent, but increase in income will be many times.

2.The urban built up area is restricted with many issues, hence large land parcels are undeveloped for years and year .The situations has resulted in urban use outside periphery of the urban bodies. The investors have purchased land with intention for NA use, but these parcels are kept vacant or barren for many years causing loss of food production. The number of un-authorized constriction is another issue with food production losses. The area in Mumbai, Pune and Nasik triangle is kept barren for many years with no legal action from the competent authority. The satellite clearly states the actual fact from image history. This has resulted urban cluster with small packet for urban land use, with lack of basic amenities such as narrow roads, traffic issues, land cost with many other social problems. The outskirts like Talegaon, Chakan, Khopoli and Lonawala, Panvel, Shahapur and many other small villages on highways are results of improper urban use. The urban land use could have well managed with modern technique like satellite imaging and digital monitoring.

3. Unauthorized constructions, encroachment and slums are important miss use of land in urban area. This has put extra pressure on the outside land and basic amenities in the city. This area is not being regulated by urban rules and regulation, that's why water, electricity and civic amenities are under tremendous pressure. The slums are source of air pollution because of burning of garbage, polluted

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factories inside slums, lack of open space and garden and other basic amenities, unclean and insufficientwater, road, sunlight with many health problems due to germs insects and strayanimals. The other issues with slums are unhygienic food, shortage or unauthorized electricity, unprotected work environment, transport problems. The above factors puts lot of pressure on the urban land, hence the land use pattern in the city gets disturbed with bad name to particular urban area.

3. The main means of transportation in the city are roads, waterways, railways, airport etc; town planners never plan them for actual need. The cities are grown naturally, at certain stage no land is left for transportation. Most of cities in India are having small narrow and gully roads with poor infrastructure. The urban area in the triangle under study is having major transport problem

4. Commercial and industrial development-The land use pattern in the urban area under study is residential, commercial and industrial. The commercial use is planned as of need of population. The industrial in the area under study is as per requirement. Due to unplanned industry, the road and transport towards this establishment are facing serious problem of infrastructures. The traffic on Talegaon-chakan Road, Pune-Nagar road, Mumbai –Pune Road and Mumbai Nasik Road takes more than 2 times in peak hours. The industry vehicles are not able to reach in time. The road requirement is much wide than current one. The roads are having large number of un-authorized constructions. Currently administration is having number of limitations for widening of Roads.

5. Other various facilities like parks and gardens, Railwaystation, government offices, hospitals, sport grounds, commercial and institutes of national international important are not planned as per need. These uses are to be planned in the development plan as per requirement in the reservation and need of public and semi public. The present land use in this urban triangle is having tremendous short for land to provide these facilities to general public. The land reserved for such amenities is encroached upon or reservation is not being acquired in time .This has resulted the lapsing of reservation in development plan. The lack of proper land use planning has resulted the major issues of environment, pollution and crowing of selected places.

7. The green uses in urban areas are garden and forest. The current policy of 30 % land as open space is not followed strictly. The agriculture land is being lost to number of un-authorized use. The urban and taxpaying constructions are few. Every municipal and urban body has number of cases of unauthorized land use. In past high court has issued the order for removal of such building in Thane, Pune and Mumbai. The issue of soil waste management has resulted as major source of pollution in urban area. Most of cities are not having sufficient land for land feeling site of solid waste use. The agricultural land, cropland ,fallow land, plantation wastelands, scrub land forest ,water logged, hills, barren rock, trees, green cover, water bodies, river streams, rural tanks, ponds are the major land uses in rural as well as urban India. The land use under this particular use is important for agricultural as well as biodiversity and forest. These are social factors and related to well being humans with climate control and pollution.

5. **Recommendations-**

1. The government administration needs long term planning to modify and correct the present land use planning as per the density of census .The land use planning should be proportional to population density in particular administrative block. The administration will fix the most accommodating population in current municipal ward or administrative unit considering the civic amenities and transport system. The excess or less pollution will be identified with targeted land parcel and it will be adjusted for town planning redevelopment or some schemes

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of rehabilitation with the help of computerised digital data. For example the population in south Mumbai will be counted digitally by Municipal Corporation and planned accordingly for suitable land use with long term and short term planning. The population in particular ward will be fixed in city planning and it will be adjusted according to future developments. Any excess population will be moved to nearby with some incentive from planning authority or government

2. The land use in the outskirts will be monitored digitally with the help of satellite images .Any loss from particular land use will be recovered from the particular investor or estate agent by administration to keep strict use for the same. The land use laws will be changes suitably to accommodate social and administrative angle of the land use. The maximum construction in this 30 % land will be only 10 % as per permission from the planning authority. The remaining 10 % green area will be achieved through the open space of individual buildings and constrictions. The present system of open space is good enough to have small packets of green area in the residential or commercial area.

3. The density of population in crowded cities like Mumbai is much higher, but the satellites maps of crowded part like Mazgaon or Bombay central, shows the number of constructions like **chawl** like structure with less than 1 Floor space index used. Such land parcels will used in systematic way to consume 4 FSI as per current policy, the additional land will be available will be use for public purpose with more residential accommodations.

4. The land acquisition wing of state is working under district administration and municipal corporations for TDR (transfer of development rights).The number of land reservations are lapsed due to proper implementation of this policy, hence land for public purpose is lost in many cases. This has negative impact on public amenities. This paper recommends that public amenities should be priority with maximum number of occupation and commercial industrial use for cities to save rural pressure on land. The land will be made available on top priority to public amenities.

5. The government must provide a dedicated app or website to commentators travelling to particular block with tentative timing of the day with their planned mode of transport, the transports like Railway or road transport authority will provide transport services according to the needs to travel them speedy and hassle free. The current system of travel is on the guess, hence overcrowding causes time delay .The transport authorities with such data can manage it well with signal timings and more specific measures. The transport authorities will provide smooth transport as per digital data to the citizens with the revenue generated from this. The public transport system for more floating population area will be powerful like metro, railways, trams, BRT, Municipal and public transport. The traffics majors' will be decided as per traffic and pollution. If the speed is less and due to traffic block, the vehicles are not moving with desired speed, the public transport will be assigned with separate roads. The air pollution will be strictly under control.

6. The land use management must be based on principal of minimum urban land use with world class facility of transport, basic amenities, recreation centres like developed nations, but the maximum land should be used for agriculture and green cover purpose. Every inch of land use by particular citizen should be linked to digital platform like **Adhar** or any other suitable digital mode. Every administrative unit of urban or rural bodies should have details of such land used by particular person with reference to the land parcel under use. The research paper suggests

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that every land parcel in the development plan should be monitored digitally for the occupancy of targeted population with generation of income like property tax.

7. The water and electricity should be supplied as per the norms determined by national agencies under government. For example if the particular land parcel is occupying 100 peoples, the water supply should as per World Bank norms of 155 liter per person, which will be 155*100= 15500 liters per day. It will be same for other amenities like electricity etc which are related to social issues like environment. This will help authorities to save land with systematic use. A particular block or ward will be targeted for defined number of population with fix supply of water, electricity with deviation of 5 to 10 % as per policy. This will help to maintain the population density. The urban land requirements for such block should be proportionate to the population and FSI in particular block or ward so that some national standards are to be maintained. The current land use is verified in census or economic survey figures.

8. The transport means will plan in advance, the land required for the transport system should be proportional to density of population in particular administrative unit. The land required for major transport such as roads, internal roads, railway tracks, metro and mono including waterways should be calculated in the development plan by panning authority. The FSI or TDR of such land use should be given to the particular land parcels under consideration

9. The industry will be planned only in industrial area. If necessity the maximum cap on such land use will be keep according to transport and pollution demands. The existing industry will be shifted to industrial area if causing any adverse effects on the transport .The new industrial area will be provided with travelling distance of maximum 30 minutes with world class travel system like metro of express way.

10. The other basic use like big institutes, the population of the particular area will be considered with plus minus 10 %, to limit the crowd and pressure on Public amenities. The common sport facilities will be included in every public garden and sport ground .The exclusive sport purposes such as golf course will be planned as per real need while the FSI of such land will be loaded in high-rise buildings nearby or in the same premises considering the purpose is for higher class citizens. The amenities listed above will be planned as per FSI or TDR concept in particular administrative block. The population growth will be treated in two classifications, first will be permanent residence and other will be floating populations.

11. The major land consuming purposes such as Airport, Industry will be included in separate Zone. The Pure residential use in such zones will be avoided. The Minimum area will be reserved for commercial use. The residential colonies if necessary will be accommodated as minimum space considering the necessity of use. Such section or administrative uses will be kept open for only commercial activity like shops and hotels. The roads connecting to such special units will be maximum at the distance of 30 minutes travel from the residential area. Most of the airports in the world are facing traffic problem, travelling from the city causing 30-60 minutes late time with pollution. This can be avoided with underground railway or high rise metro trains of high speed.

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