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Articles

Urbanisation, Slums and Incidence of COVID-19: Undertaking Reforms

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ABSTRACT

COVID-19 being the headliner of the year 2020, in the absence of a vaccine or medication, has engulfed the whole world. In India, though the lockdown was conceived as a response at a very early stage, the number of cases have multiplied more than 1000 times since then. Data emerging since shows that the outbreak is primarily urban and given the life conditions in the Indian urban areas in general and slums in particular, there had to be a connect between urbanisation, slums and the incidence of COVID-19. The following note first establishes the above-mentioned fact with special focus on slums. In managing the spread of the virus and taking effective measures in responding to its spread, the vulnerabilities of these ever-expanding cities/ slums have been exposed, once again emphasising the need for higher investments in public health, improvement in the state of the slums and eventual creation of affordable houses, more than ever.

Keywords: *COVID-19, Governance, Public Health Infrastructure, Slums, Urbanisation*

'More than ever before, there is a global understanding that long-term social, economic, and environmental development would be impossible without healthy families, communities and countries.'

– Gro Harlem Brundtland (GoI, 2020)

INTRODUCTION

Originating from the city of Wuhan in China, SARS-COVID-19 has become a global household name over the past five months, and not

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in a pleasant way. Over eight million COVID-19 cases, claiming 4,35,000 lives, have been reported globally as of June 17, 2020. Knowledge of possible devastating consequence of the pandemic and the will of the citizenry towards self-protection, not to mention a bit of political leadership, has played its part in preventing its spread to the worse (Guru, 2020). Since the pandemic apparently has covered rich and poor nations alike, it has questioned the health infrastructure of all. Even the developed nations with well-established public health facilities could not contain the outbreak and had to eventually announce a lockdown. Fortunately, India had examples to learn from the global experience. Prime Minister Narendra Modi announced a complete lockdown of the nation at nearly 350 COVID-19 positives. Despite (or because of) the lockdown, today we stand at (only) 3.5 lakh cases, mostly concentrated in highly urbanised centres of the country.

The pandemic has caught the world by and large, but especially us, unaware primarily on two fronts. Firstly, the lack of adequate public health infrastructure, and secondly, the matter of socio-economic integration of the poor, in particular slum-dwellers and migrants, in the urban system. Needless to emphasise that what lays ahead of us, as we try to emerge from COVID-19, is an 'unimaginable economic pandemic' (Chakraborty & Thomas, 2020). Whilst the government with the help of various task forces is trying to do the fire-fighting, in this piece we are primarily concerned with identifying what is missing and the reforms to be carried out going forward so that we are better prepared when such an eventuality comes upon us the next time around as it inevitably will.

This article consists of six sections. Starting with an introduction, the paper underlines in Section 2, the positive correlation between urbanisation, slums and the incidence of COVID-19. Section 3 elaborates on the plight of the marginalised slum dwellers. Section 4 describes some challenges that lay ahead of the economy in the upcoming post-pandemic times. Section 5 suggests a road ahead that elaborates on the suggested vision for social sector investment in future. Finally, the last section suggests the reformatory action plan indicating the correction of essential institutional fundamentals in urban areas.

URBANISATION AND INCIDENCE OF COVID-19

The pressing priority today is to understand the weak links in our system not only to manage it now while it is spreading like wildfire, but also to manage such a crisis better in future. Therefore, to review the spread of COVID-19, it may be worthwhile to meditate upon its linkage with urbanisation. In order to validate the aforementioned point, the authors used a few proxies, advisedly using simple statistical tool, and

found the correlations enlisted in Table 1. Along the lines, they found a considerable positive correlation of higher rate of urbanisation and the corresponding high slum population with the increased incidence of COVID-19 in Indian States.

TABLE 1: CORRELATION BETWEEN STATE- WISE URBANISATION, SLUMS AND COVID-19 OUTBREAK

X Variable	*Y Variable*	*Correlation Coefficient*	*Correlation*	*Inference*
Total urban population in the State	Number of COVID-19 cases in State	0.74	Strongly positive	Urban areas are the centre of the outbreak
Number of Class I towns in the State	Slum population in the State	0.67	Moderately Positive	Higher slum population in bigger cities/ towns
Number of Urban Agglomerations in States	Slum population in the State	0.68	Moderately Positive	Higher slum population in Urban Agglomerations
Slum population of States	Number of COVID-19 cases in State	0.70	Strongly Positive	States with higher slum population have higher incidence of COVID-19
NSDP of States	Number of COVID-19 cases in the State	0.82	Strongly Positive	Richer States are worst affected by the outbreak of COVID-19

Source: Computed by authors using (MoHUA (GOI), 2019), (Census, 2011), (Chandramouli, 2011)

Perhaps a word about the computations reported above is in order. Strictly speaking, we should have normalised the variables by taking into account and benchmarking the COVID cases *vis-à-vis* slum population in the relevant city et al. But given that this is an evolving situation with numbers changing on a daily basis it would still be prone to criticism. However, the authors opine that the essential point of their having a significant value would not be affected. Also, the purpose here is to merely flag the overwhelming prevalence of COVID cases where slums exist as well as where there are economic poles.

The positive correlation between urbanisation and COVID cases can be explained by the nationwide lockdown that prevented the spread in rural/ lesser urban areas as the origin of the disease is not India. People having history of International travel used airports located in urban centres and most of them were blockaded due to the lockdown, making the incidence of COVID-19 thick in here. Ironically, although rural India was protected by the lockdown, urban villages/ slums were forgotten or perhaps could not be protected to the same extent. A similar point can be made when the correspondence between Net State Domestic Product (NSDP) and COVID-19 cases, and slums and COVID-19 cases is read together. Alternatively said, in a certain sense COVID-19 becomes an issue of the richer states and unfortunately, of the poor people within these rich states.

PLIGHT OF THE SLUM-DWELLERS: TRYING TIME

Speaking plainly, most of the poor/ slum-dwellers work to earn their meal everyday and cannot afford the lockdown for too long. Even with the easing of the lockdown, employers of slum-dwellers are reluctant to call them back to work owing to fears of COVID. Stating the obvious, slum-dwellers here don't have a great set of choices. Though the lockdown challenged their income flows, the expenses were still on track. A considerable share of slum dwellers/ informal workers in Mumbai occupy their residence as tenants. Though the government announced relaxation in rentals, on ground, most of the landlords will be in distress in case of defaults as the rents so accrued forms a considerable part of their income. ("Plight of the Stranded Workers," 2020). Besides, poor people have to step outside for work, groceries, etc. as they lack both resources and space to stock up. Though free food is being distributed in some slum neighbourhoods by authorities, NGO's and in individual capacities, people coming out in close proximity for its collection defeats the purpose of a complete lockdown. If they don't step out, they will die due to hunger, the probability of which is way high. Another transmission hotspot in slum neighbourhoods is the community toilets. Also, let alone the use of sanitisers by the poor, frequent hand-wash is also possible only when there is piped water connection in these slums. According to National Sample Survey Offfice (NSSO) data, 40 per cent of urban households do not have access to piped water inside their residence (Khan & Abraham, 2020).

A dual segment has been created over time with the commercialisation of healthcare where the rich accesses the private medical care and the poor resorts to the impaired public health system (Parmar, 2020). Once again, slums are under focus from the public health viewpoint. In fact, in testing times like now, the absence of sufficient slum improvement

policies in state agenda is apparent. Moreover, owing to minimal investment on public health over the years, it is presumed that there is a considerable underreporting of COVID cases in India. There have been incidents where the poor people have died before reaching the hospital, but they were not tested to ensure the most efficient use of the limited COVID-19 test kits. Also, given the limited capacity of government labs and high costs of testing at private labs, it is undeniable that the unintended/ unsaid casualty will be of nation's poor population. The testing capacity in the state of Bihar (one testing facility for 110 million population), is a display of insufficiency at its worst (Kumar & Kumar, 2020). Public health is under due surveillance worldwide and even higher in developing nations.

It is true that the poor people are unable to afford the Out-Of-Pocket Expenses (OOPE). In India not only OOPE, but even the regular medical expenses are quite high. The budgetary allocation for public health in almost all the states has been quite dismal. The argument here is that since the states have been ignoring the public health of their citizens over the past years, it is costing them heavily now. Besides public health, extreme dearth of affordable housing in urban centres that create opportunities for slum creation and their sustenance becomes an even bigger focal point. Increased incidence of COVID-19 in slums has highlighted the impossibility of social distancing and home quarantine, both inside a slum and within a slum neighbourhood.

CHALLENGES AHEAD

Undeniably, we have failed to manage our cities and the systems governing it on multiple fronts. It is argued that privatisation of public services like health and public distribution has exposed their fragility to such a critical situation (Harilal, 2020). The foremost challenge is to keep the institutional memory strong enough so that the lessons drawn from the current situation persist post-pandemic. Some lessons from Kerela might be drawn here. They made planned investments in public healthcare system to enable them to expedite testing in case of COVID-19 and execute required measures faster than any other state (Roy & Dave, 2020).

Another challenge the pandemic is bound to confront is for the real estate sector. Since work-from-home has been experimented for long enough during this 68-day lockdown period, it may become a new working model for some corporate. Consequently, the palpable impact on commercial real estate prices along with the response of the residential real estate segment could bring an interesting downward trend in the real estate markets of high-priced urban spaces. The real

estate prices are observed (casual empiricism) to have dived to a level that is 25 per cent lower than the ready reckoner prices. In the first instance, simplification and rationalisation in the real-estate segment will incentivise investment which would kick start the economy as it is well known that construction always leads to a recovery. More pertinent to the theme of this piece, a comprehensive reform in the housing sector policy (rental policy included) will help investors find a revenue model in the segment of low cost housing and would be incentivised to invest in it, which will make a significant dent on the issue of slums (Tandel et al., 2016).

It is argued that welfare state, regulations, license raj, socialistic state, rural economy are more bankable arrangements in such times (Roy & Dave, 2020). However, given the limited capacity of the state and the fact that it is very easy to resort to these so-called safer bets in the time of crisis, but very difficult to wean away from them post-crisis and to get back to the dynamics of the private sector.

ROAD AHEAD

The global crisis is just expected to go deeper in the coming weeks. Having been reminded time and again of the areas that are most affected in crisis times, the requisite measures are most often not planned and executed with a true intention of improving the situation permanently. Whatever comes from the State is knowingly *make-shift* that wipes-out and is forgotten post-crisis. The State needs to step back a little to view the macro economic turmoil holistically and create fresh agendas, re-route and revise the plans, set new multi-directional targets whilst the long-term vision is complemented with short and medium-term targets with checks at various milestones (Pethe & Nallathiga, 2010). For starters, we need to be realistic and accept that the phrase 'slums free city' belongs to fiction, especially for countries at a stage of development like India. Without asking for much, slums provide an optimal housing solution to poor, provides low cost labour to the city, demonstrate the most efficient use of space, exemplify as a proven centre for entrepreneurship, to name a few. The slum profile has transformed over the years from an illiterate, unaware clusters of poor, to dynamic neighbourhoods sheltering even LIG and MIG households. It is time we accept them as a part of urban areas and start providing for the basic services at least. Alternatively said, instead of treating slums merely as vote banks that are paid back in terms of small gifts like community toilets, there is a need to step-in a big way with a multi-pronged agenda for their betterment as soon as the pandemic settles down.

Given the current pandemic exigency, the priority investment

sector is undoubtedly public health. The budgetary allocation on public health has been dismal at 1.6 per cent of the GDP in 2019-20. This share includes expenses on medical and public health, family welfare and water supply and sanitation (all more important than one another). Implying, the expenditure on 'health' at national level is as low as 0.5 per cent of the GDP (GOI, 2020). It is therefore a sensible policy choice to increase the allocations permanently rather than temporary spikes in crisis time. As witnessed presently, any further neglect in the same would cost the exchequer much more, purely in economic and financial terms, forget about the human cost involved. Though the OOPE has reduced from 64.2 per cent in 2013-14 to 58.7 per cent in 2016-17 (GOI, 2020), it is considerably high compared to global standards. Even with designated quota for treatment of the poor in private health care centres, the implementation has been rather disappointing. An extension in the coverage of the policies like National Health Policy and Ayushman Bharat from the current 10.4 crore poor to all those who struggle to afford medical services, would be a good start. Not to mention, all such policies are expected to conclude at an infallible implementation and delivery mechanism. Moreover, an understanding between the private and public sector in case of such health emergencies is a must to mitigate the socio-economic effects (Parmar, 2020). Apart from an increased investment in medical facilities, the purchasing power of the poor to afford these services needs to be minded.

Since categories under social sector near or far complement each other, alongside public health, investment in social sector needs to be increased on the whole. Integration of slums into the existing city systems like sanitation, waste-water disposal, solid waste management, sewage and drainage, etc. should be a priority for one and all at every level. Second, the integration of slums needs to be complemented with data collection in order to facilitate the inclusion of slum dwellers. Concurrently, investment in education sector is critically important. Even though 3.1 per cent of the GDP is being spent on education and is the highest allocation amongst social services, 37 per cent of the global illiterates are Indians, 92 per cent of government schools have yet to implement the Right to Education (RTE) properly and we rank 123 amongst 135 nations measuring female literacy rate (Oxfam India, 2015). Existence of disguised unemployment in agriculture, high rate of educated unemployed in formal sector and over 90 per cent employment being generated in the informal sector is a testimony in itself that though literates in India are equipped with reading and writing skills but are not skillful enough to be meaningfully employed. The State needs to rethink the definition of literacy in current times. When literacy was first defined as "the ability to read and write at the age of 7," communication

was probably the required area of intervention. Now, when we stand at 74.4 per cent literacy rate, as per the aforementioned definition, the focus needs to shift towards provision for building a skillfully educated India and creating an enabling environment for creation of formal jobs and entrepreneurs. The remaining three per cent of the 7.7 per cent allocated to social services is shared between housing, urban development, welfare of SCs, STs and OBCs, labour and labour welfare, social security and welfare, nutrition, relief on account of natural calamities, etc.

Albeit, considering the stage of development of Indian cities, sizeable investments are required in all categories of social sector. Based on the turnaround time, it is suggested that these categories and milestones within each are classified into short, medium and long-term targets. For instance, public health, water and sanitation, family welfare, welfare of labour, nutrition, etc. may be intervened in the short period and medium term with continuation plans for long-term. Education on the other hand, has a greater turnaround period and needs constant plug-ins and hence should be on a constant radar at all times in long-term. Categories like housing and urban development (though already covered partially) have the longest turnaround period and need lumpiest investments of all. Nevertheless, housing must run in the agendas in a parallel manner. Since slums and associated peripheral issues exist due to dearth of affordable houses, the ultimate long-term goal in cities need to be creation of affordable housing stock. In the meanwhile, urban areas and slums should be made better places to live by integrating them with the city. Politically motivated policy solution, like the formation of Slum Rehabilitation Authority in Mumbai, has resulted in only creating more slums everyday than rehabilitated. Land being the primary roadblock for the provision of affordable housing, releasing public land in the market for the sole purpose of creation of affordable houses shall help. Certain other micro and macro-level challenges like higher unemployment in both organised and unorganised sector, increased poverty, etc. also need government's focus at some point.

REFORMATORY ACTION PLAN

Decentralisation

This typically comprises of delegation, decongestion, and devolution. The first two are practical actions referred to as agency transfers where there is minimal autonomy at the lower levels. The underlying principle informing the utility of the concept of decentralisation is the subsidiarity principle which recognises the fact as one traverses lower in the system, there is greater richness of information and generally prescribes that suitable actions can and

should be initiated at that level to tackle the problem. The third aspect of decentralisation mentioned above viz., devolution, is most crucial and talks of devolving the resources and authority to diagnose the issue as well as design the policy or action plan and has the implicit autonomy to carry it out. Thus, it implicitly assumes the empowerment of the lower entity and expenditure autonomy towards the attainment of desired outcomes. The theme will be elaborated and expanded specifically in the next two points. Whilst there are enough hints and institutional support for this principle to be adopted in practice, decentralisation as an organising principle must underlie most actions and must be accepted wholeheartedly by the policy makers and government of the day, in letter and spirit. This requires more than just mindset change at the higher level of government but given that resources are transferred without strings implies a loss of power and this requires a certain amount of political will and maturity.

Urban Governance/ Management

Fighting wars and epidemics in compact and dense constructs like cities pose a special challenge. This is amply illustrated by the experience regarding Covid-19, in Mumbai (as in New York). But these are also spaces that rise to the challenge. The crisis allows us to revisit the crucial issues of city management and urban governance and maybe do something about to have a long-term positive impact. From an economic standpoint, India's future is urban. This is even true in the case of Maharashtra which is one of the most urban states of India. It is a fact that cities primarily be looked at from the twin lens of liveability and livelihoods. This involves provision of local goods and services including affordable housing on the one hand and creation of an environment that attracts investment leading to accelerated growth, which in turn creates jobs. On both these counts our cities leave much to be desired.

There is a lack of good governance and missing local public finance. Good governance may be seen to be made up of policy-framework (informed by basic economic principles), simplification of processes and protocols (transaction costs) and building of capacity to implement (delivery). There are well-known ways of working on each one of these components to achieve good governance. The first component is very important, if not informed by basic economic principles, it leads to unwarranted incentives for the agents who then take actions predicated on them leading to undesired outcomes. The second component is easiest to comprehend but not always very easy to do. This is because the involved processes create a sense of power and vested interest amongst the bureaucrats at all levels who do not easily let go and hence defy

any movement towards change. The third component is the capacity to implement the policies.

But most fundamental issue is that of resources and the empowerment of Urban Local Bodies (ULBs). The local governments are simply too weak economically and this needs to be remedied. The revenue handles that exist in the post-GST regime are inadequate even when exercised efficiently. Actually, the only revenue handle of substance that is now available with the local bodies is the property tax. A serious reform in terms of bands/ rates and most importantly the coverage is called for. For this, setting up of functional Property Tax Boards is a must. No one can argue against the need for reform in this arena. The fact however, is that no city in the world (with similar tax regimen) actually is able to finance more than 30 per cent of their expenditures. Thus, cities, whilst they are wealth and value producers, are at once not self-sufficient. This is simply the result of the way our tax system is set up. There is an inevitable need for the flow of funds from a higher level of government. Of late, the Central Finance Commissions have been proactive in lending their hand. These flows must not be seen as aid but rather as an investment so that the higher-level governments continue to benefit via tax buoyancy (among other things) resulting from well-functioning cities. The State Finance Commissions(SFCs) are the vehicles for such transfers from the state governments to local bodies. These SFCs must be treated seriously and their awards must implicitly have the same status as the Central Finance Commissions enjoy at the Central level. These are the minimal prerequisites that will ensure the 3Fs (functions, functionaries and finance) will be catered to properly and cities can begin to be empowered adequately.

We do not get into the crucial slum issues since they are too involved, and the currently extant approaches/ policies have not made a dent. But one thing is certain, since slums are a part of the overall housing sector which is highly segmented and each of the segment (except the highest one) suffers from excess demand, it is crucial that policies to incentivise private players to come forth and find a revenue model in the affordable segment of the housing sector. Without this an *antyodaya* type policy initiatives, by themselves trying to cater to the lowest rung, are bound to suffer from elite capture and fail. We have argued elsewhere how and why the wrong-headed policies must be reformed to improve outcomes. The two specific policies in this category that create impediments in the way of provision of affordable housing are the policies related to rent control and the Urban Land Ceiling Act (ULCA) (Pethe, 2010) (Tandel et al., 2016) (Pethe & Sharma, 2020). The policy of rent control has virtually killed investment in rental market

and shut this affordable option for many citizens. The ULCA has the distinction of having traversed the path of being dysfunctional when in operation and continuing to be so even when it has been removed, with the effective land supply continuing to be scarce, compounding the problems brought about by the restrictive linear geographical boundaries of Mumbai. In the same vein, we need to revisit the entire arena of Development Plans (DPs) (Pethe et al., 2014). They should be related to relevant budgets and have prioritisation and rolling character built in. They should be minimalistic and strategic rather than overly detailed. In the matter of city management and empowerment, it may be useful to seriously look at the transformative and comprehensive Sharad Kale Committee Report submitted several months ago to the Urban Development Ministry, Government of Maharashtra. In sum, to list some action plans in this context:

- Empower ULBs economically by transferring all possible revenue handles and decentralise (devolve) in true sense.
- Take SFCs seriously and give the same sanctity to its awards (formulaic devolution) as Central government provides to its Finance Commission awards.
- Set up Property Tax Board to reform, regulate and monitor implementation.
- Reform Rent Control and ULC policy to enable rental market to prosper and hence help with revitalising affordable housing market.
- Simplify processes and protocols to reduce transactions costs.
- Set up an Urban Observatory (real time) complete with IT leveraged data visualisation (including shape files of wards/ maps) that would monitor outcomes independently.
- Capacity building should be taken seriously starting from a coherent HR policy right from recruitment and creating training modules/ manuals to facilitate the employees with carrying out their tasks. This should include budgetary reforms that provide expenditure trace.

Public Health Management

One of the lessons we can learn from facing the challenge of Covid-19 is that whereas some amount of vision and wherewithal comes from the top, a lot of the operations need to be planned to keep in view the specific situations including geographies. Public health management is a case in point where decentralised effort may be most

fruitful in terms of recognition of the problem, the felt needs of health-related equipment (hence procurement) and human resources. It is such places where we will most likely find delegated expenditure autonomy with oversight to be most useful and logistically tractable. The corona pandemic has revealed some important weaknesses of state and local governments in organising, enabling and delivering crucial services. Health services including dealing with epidemics is a state government subject but have to be delivered with the active participation of the local government. The public health centres, health care centres and hospitals of local bodies are known to be ill-equipped. This needs to be corrected with the active initiative of private and NGO sector participation on a PPP basis. The overall structure and design of the public health system call for a reform and politically it will be feasible to push it through just now. The capacity at the agent and agency level calls for a serious bolstering. The Universities and Government Administrative Staff Colleges can be roped in to create training programmes and help deliver them innovatively. The Universities could also set up PHCs dedicated to monitoring outcomes and collecting relevant data in a convenient form that could come in handy when another crisis strikes as it inevitably will.

It is essential that the State takes a major initiative in setting up Research Centres and Hospitals (in the nature of Crown entities) which would operationally run by the local bodies. These Crown entities would concern themselves specifically with epidemiology/ infectious diseases and would be adequately sourced**.** Some of these entities (especially field hospitals can be set up as temporary ones in an innovative way so that they go back to other utilities but with an easy and fast reversibility if the contingencies arise. Apart from capital assets, the softer resources such as medical support staff are absolutely essential and some long-term measures like encouraging courses in nursing (which for some reason have been banned/ certainly not encouraged in Maharashtra) and courses in para-medical arenas so that such lack is not felt in the future. We could also have some thought on having reserve 'army' of such trained personnel that could be called upon as first charge if contingency arises.

Thus, some of the specific action points would be as under:

- Make a self-binding commitment to allocate sufficient budgetary resources to Public Health (from the current pathetically low level). This is required even if it is at the cost of some other expenditure head.
- Create pathways and delegated expenditure autonomy (for example, for procurement of health equipment and temporary

human resources) and most importantly capacity to efficiently and effectively use these resources (State Budgets as well as Central Fund flows) for targeted outcomes.

- Set up PHCs of Research in the University to document, collect relevant data and monitor outcomes *a la* Independent Evaluation Office (IEO).
- Use Universities and Yashwantrao Chavan Academy of Development Administration (YASHADA) like organisations to develop and deliver training capsules and programmes to build capacities of agents and agencies.
- Set up Research Centres and Hospitals in the nature of Crown entities which would be operationally run by the local bodies specifically focused on study of epidemiology and infectious diseases.
- Take actions to be prepared with availability of physical assets and more importantly supportive staff who can be called upon at a moment's notice.
- Slightly more difficult area of reform and experimentation could be introduction of PPPs in the health sector. Learning from what little success we have elsewhere needs to be imbibed and attempted to be put into practice.

Statistical Board

Not just in diagnostics of Covid-19 or in taking action related to its containment, even otherwise the general lack of data availability has been seen as a major problem in providing empirically evidenced and data-driven policy formulation and action. Different departments in the government, indeed, collect data on various variables and attributes, however, neither is it compiled in a user-friendly form nor is it available in public domain. It is in this context that there is a felt need to set up a Statistical Board. It should be set up by considering the architecture carefully based on the underlying information policy of the State so that proper gateways are provided for different categories of stakeholders. The architecture could be decentralised and hierarchical but would need careful thought. This would be easily possible using IT and indeed the data could be available in different visualisation forms, including geographical mapping which is hugely important in carrying out the logistical exercise. *Creating a comprehensive yet modular empty shell and then fleshing it out strategically and severally is the way***.** Directorate of Economics and Statistics should be leveraged for this purpose and perhaps reviewing the report on DES - Restructuring (Chair: ACS GAD)

submitted a few months ago, could be a starting point. Most of the State governments suffer from information and data deficiency in many several areas/aspects. The system of data and information collection is inadequate, slow and based on the old regulatory paradigm. DES should change itself as a big data generation agency in following ways. As an important aside, the really important feature here should be that instead of collecting the data every time, protocols should be mandated such that the data from different sections/ departments should seamlessly flow into the Data base/ warehouse so set up.

In the present context, the very least we could do, as a part of setting up of the Statistical Board is to create Urban Observatories. These would be more than just haphazardly collected data or even a well-compiled data base but more in the nature of live data warehouses. These would be real time (live) data structures covering different dimensions and physical and financial indicators and outcomes within the geographies of cities. The representation would be through numbers maps and innovative data visualisation techniques. Suitable gateways could be provided (as per the information policy of the State) for different stakeholders (government/ non-governmental agencies et al.). Given the extant prowess which we are proud of in the areas of IT and GIS among other things, surely this is doable. It would then provide an empirical basis for evidence-based decision making and the NGOs and others would be able to perform the role of responsible watchdogs ensuring accountability on part of the government of the day. We may mention here, as an important aside, that this kind of granular data (implied above) if available, would have allowed us to tackle the issue of fleeing migrants far more efficiency and with far fewer human costs involved. We may mention that such a comprehensive slum census is implicit in the JnNurm pre-requisites but have not been complied with. The presence of slums and the associated informality makes the coverage of any policy incomplete in the absence of a granular database. Not to mention, missing on paper is a sure miss from policies. In order to be better equipped next time around, the starting point must be acquisition of data. To repeat, even with the resource crunch, the lockdown in India could have been dealt in a much organised way even if simple habitat information was available for migrant workers like their resident slum, state from where they have migrated, their workplace among other things.

Thus, we have identified the epicenter of the locus of Covid-19 and suggested a minimal and we believe doable reform actions, in reasonable time frame, that would serve us in good stead in the future, with or without the recurrence of a crisis. It would be appropriate to say that urbanisation and high densities, when well-managed, are better in terms

of carbon footprints and lead to agglomeration advantages and high productivity gains resulting in unprecedented growth and development (actual & potential) in India. The tremendous agglomeration advantages of compact and dense cities should not be lost sight of. India's future continues to be urban and let's not detract from this fact.

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Challenges in Times of Covid-19 Pandemic

V GNANESHWAR*

ABSTRACT

Pandemic in simple terms is an infectious disease spreading into various regions and continents affecting large populations. World witnessed several pandemics earlier like Spanish flu which led to heavy human loss and suffering hundred years back. In recent years viruses like SARS, Ebola, Nipah, etc., have affected humans. The latest of this is Covid-19 virus belonging to SARS group.

In this article an attempt has been made to discuss urbanisation and ecological linkages, urban bias of Covid virus spread and the impacts of virus infections. The issues arising out of Covid virus and the strategies adopted to deal with emerging problems in India are discussed along with some light on international experiences. Covid virus is a developing story hence, the discussions are based on present situations and experiences.

Keywords: *Urbanisation and ecological linkages, urban bias, impact of virus*

URBANISING WORLD

Urbanisation is the global trend witnessed more vigorously in the post-industrial era across the developed countries. The countries in the developed region became more urbanised with urbanisation levels reaching 70-80 per cent. The urban centres were developed with great foresight and good infrastructure facilities. Urbanisation in the developing world picked up rapidly in the past 50-60 years outpacing the developed regions. Urbanisation is a complex socio-economic process that transforms the built environment, converting formerly rural into urban settlements, while shifting the spatial distribution of population from rural to urban areas.[1] It changes balances in ecological, demographic and social structure across the globe. The wellbeing of

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humanity ultimately depends on whether the governments in developed and developing regions unitedly deal the emerging problems or keep playing blame games fighting one another.

The pace of global urban population growth is phenomenal. For instance, it took 10,000 years of human history for the world's urban population to reach one billion in 1959. It took 26 years for two billion in 1985, 17 years to reach three billion in 2002 and mere 13 years to reach four billion in 2015 and estimations indicate that it will reach five billion by 2028 and six billion by 2041 taking 13 years for each billion. Further, urban population increased from 29.6 per cent in 1950 to 55.3 per cent by 2018 and it is expected to increase to 60 per cent by 2030 and 68 per cent by 2050. It is reported that more developed world has only 23.6 per cent of world urban population as against 76.4 per cent in less developed countries in 2018 which the developing world is estimated have 79.7 by 2030.[2]

If the above trends reveal the pace of urban growth, the more severe problem is the intensity of urban growth. Rapid urban sprawl is leading to growth of mega cities engulfing the peripheral semi-urban settlements. Of world urban population, 42.1 per cent is living in 548 million plus cities. Further, 12.5 per cent is living in 33 mega cities of 10 million population distributed across 20 countries.[3] This speaks of the level of urban concentration. At the city level, similar problem relates to population densities. It was estimated that average density was 2,450 persons per square kilometer in the 50 KM vicinity of the seven largest metropolitan areas with population above four million as back as 2001 (World Bank).

Indian Urban Scenario

In the entire world, China and India are experiencing population pressure due to general population growth. In the urbanisation front also both the countries are witnessing rapid urban growth. The urbanisation growth trend in India indicates that the urban population which was 78 million in 1961 increased to 377.1 million by 2011, near about five-fold increase in five decades. The critical factor is net decadal addition of urban population which rose from 30 million in 1971 to 91 million by 2011. This urban growth is mainly due to migration of people from rural areas in search of employment. Migrant labour is therefore, a critical factor in urban development in India. Unfortunately, this aspect has been ignored by the policy-makers in devising the development programmes until the recent outbreak of the Covid virus which put tremendous pressure on the migrant labour in India due to job losses.

Another trend witnessed in recent decades is the gravitation of rural migrants into the middle order and large cities. For instance, 70 per cent of people live in one lakh plus cities in India. Rapid growth of million-plus cities is another trend in large cities. Large cities are experiencing rapid urban growth spilling over into the surrounding towns and other settlements. More significantly, milion-plus cities increased from just seven in 1961 contributing about 23 per cent to total urban population to 53 by 2011 contributing to 42.6 per cent to urban population in about five decades..

The core cities continue to experience population pressure and concentrated development. This trend has an impact on population densities in core cities. A third of India's new towns came up in a 50 km neighbourhood of existing million-plus cities. Added to the population pressure, rapid growth slums is another important trend in India. As is widely known, Indian slums lack even basic civic amenities like water, sanitation, and health. The densities are higher due to congested growth and small tenements housing more people. Further, older parts of cities continue to have more population and congested living. All these factors lead to higher population densities in core cities.

INDUSTRIALISATION, URBANISATION AND ECOLOGY LINKAGE

Industrialisation which began during the 19th Century continued through 20th Century with more vigour. One of the outcomes of industrialisation is urbanisation. Urbanisation involves shift of people from rural to urban areas adopting non-agricultural occupations. As people tend to move towards urban settlements, spatial patterns of human habitats change. At global level, it disturbs the eco balances leading to a plethora of problems like melting of glacier ice, rise of sea levels, deforestation, invasion of wildlife into human settlements, etc. The effects of rapid urbanisation are widely discussed, and the scientists and responsible elite groups continue to warn countries on the coming calamities like ozone erosion, flooding of cities due to increasing sea levels and changing weather patterns, and increasing pollution – all affecting human well-being adversely. Of these, environmental pollution aspect has been widely discussed across the globe as well as in India. Despite certain efforts, pollution continues to be a critical issue for urban health in India.

Deforestation-wildlife habitat disturbance-virus outbreak linkage

Deforestation is taking place due to increased human activities like agriculture and industries. Apart from its ecological impacts, it has disturbed the forest wildlife. As things turned up, disturbing the wildlife

habitats, in fact, became a threat to the human health. The governments unfortunately prefer to continue the disturbing activities in the name of development. Always busy with politics and normal administrative issues, governments rarely give importance to the emerging ecological issues and problems.

Studies often bring out that various viruses which live on wild animals are slowly entering into human settlement domain affecting their health adversely. For instance, in 1998, a novel paramyxo virus named Nipah virus, broke out in Malaysia. Scientists have found link between the deforestation and outbreak of Nipah virus. The disease was transmitted from pigs to humans. It is observed that pteropid fruit bats were identified as a natural reservoir host[4]. This virus naturally lives in forests hosting on bats. It has been seen that the forest habitat of these bats in Southeast Asia has been substantially reduced by deforestation for pulpwood and industrial plantation. Later, in September 1998, an outbreak of fatal febrile encephalitis occurred in inhabitants of Ampang village, Kinta district in the northern peninsular Malaysia.' Investigations found that the outbreak was preceded by the occurrence of respiratory illness and encephalitis in pigs in the same district and later in 1999, similar diseases in pigs and humans were recognised in the central and southern part of peninsular Malaysia due to movement of pigs outward. Slowly it travelled to Singapore. Eleven respiratory and encephalitis illness including a death were reported among abattoir workers in Singapore who handled pigs from the outbreak regions in Malaysia. The outbreak in Singapore ended when the importation of pigs from Malaysia was prohibited and the outbreak in Malaysia ceased with the culling of over a million pigs. A total of 265 cases of encephalitis including 105 deaths associated with the outbreak were recorded by May 1999 in Malaysia.[5] The virus outbreak was interlinked to several chain activities starting from disturbing the bat habitat to pigs and pig industry, food, migration, etc.

Scientists argue that many viruses exist harmlessly with their host animals in forests, because the animals have co-evolved with them. But humans can become unwitting hosts for pathogens when they venture into or change forest habitat.[6] Further, it is stated that malaria which kills over a million annually due to infection by Plasmodium parasites transmitted by mosquitoes, has long been suspected of going hand-in-hand with deforestation. In a study based on satellite and health data by MacDonald and Stanford University's Erin Mordecai[7] reported a significant impact of deforestation across the Amazon basin on malaria transmission. It is further estimated that between 2003 and 2015, on an average ten per cent yearly increase in forest loss led to a three per cent

rise in malaria cases. It is also brought out that some viruses like Ebola or Nipa, can be transmitted directly between people allowing them to travel around the world as far as there are humans. Zika virus, which was discovered in Ugandan forests in the 20th century, could only cruise the world and infect millions because it found a host in *Aedes aegpti*, a mosquito that thrives in urban areas.[7]

IMPACTS OF COVID-19

Unlike the other viruses, Covid virus has turned out to be a pandemic and global problem covering majority of the countries across the world. Every country is facing problems in dealing with the outbreak of the virus Covid. Surprisingly, even the developed countries are struggling to deal with the problems. The situation in India with poor healthcare facilities is more severe. Covid virus belonging to SARS group originated in Wuhan city, China like many other SARS viruses. The SARS virus first originated in China in 2002-03. It was named Cov-1. It infected large number of people in China and Taiwan causing heavy fatalities. The SARS virus which broke-out in Wuhan, China in December, 2019 is named as Cov-2 or Covid-19. This new version of the virus is more virulent compared to Cov-1 and spreads fast among communities. China defends that it originated in the wet meat markets which are extensive in the country, the countries like USA are suspecting that it might have leaked from research labs in Wuhan city. Covid virus is dangerous as it spreads through human contacts. The virus can travel to other countries through human carriers. Recent studies also show that it can survive in air in the form of aerosols for hours together leading to easy spread in communities. The symptoms and effects of virus on human health are still being investigated. Everyday new findings are revealed creating a kind of panic among common people.

At the global level, countries are blaming China for its failure to control the spread into the other countries. Free international travel from Wuhan in the initial days of November and December, contributed for its transport to other countries from where it originated. While the political blame game continues, economic repercussions are leading to severe unemployment and loss of jobs due to lockdowns affecting the livelihoods of people.

Urban Impact of Covid Virus

The population of developed countries is mostly urban. The prominence of Covid cases in cities like New York, Chicago, Los Angeles, and London indicate the urban bias in developed countries. If the international travel across the cities contributed for migration of virus into other countries, the higher densities of populations in cities

have contributed for the spread of virus among communities. In the initial stages, international travellers were not screened and quarantined properly for virus. In the communities, the dense populations and lack of restrictions led to wider impact. All this led to virus spread.

Wherever human densities are high, scope for rapid spread increases as humans are the prime carriers. The spatial nature of Covid virus spread reveals that countries and regions/cities with large populations and densities have become super spreaders of Covid. Cities have turned out to be epicentres of the virus due to slums and dense populations.

Urbanisation in India has been fast in recent decades. Urban density is evident from the fact the rural areas which roughly occupy 90 per cent of the area has about 70 per cent of the population. States like Maharashtra and Tamil Nadu are more urbanised in India. Expectedly, Maharashtra state contributes to 24 per cent of the country Covid cases and Tamil Nadu 14 per cent. The rapid population growth in the country led to unprecedented migration to large cities like Delhi, Mumbai, Bangalore, Hyderabad, and Chennai turning them to mega cities. The mega cities lead in high population densities and growth of slums. The Covid statistics are not maintained to differentiate between the urban and rural areas. But the broad trends indicate the urban bias. The dominance of mega cities including their vast urbanising hinterlands, and the secondary cities in the districts in the Covid virus spread undoubtedly prove the urban bias.

Urban densities create complex problems in dealing with the Covid virus. In core cities, densities are high and family sizes are also high. People live in congested areas with very less lung space. In the developing areas especially in mega cities, the colonies lack basic infrastructure and civic facilities including health and sanitation. Slums have become common in core and developing areas in cities. At the other end, older parts of cities are overburdened with more population and deteriorating infrastructure requiring redevelopment. Managing the slum areas and old cities, therefore, became a herculean task for the civic authorities even in the normal times. It is unfortunate that despite spending huge money for slum development, slum life has not changed much in India. If increasing pollution has been affecting health of the urban dwellers, the increased urban growth put tremendous pressure on local authorities to maintain basic services. Sanitation and public health are the most affected areas in cities and towns. The ULBs are put to most stress in these aspects in Covid times. Though capacity building efforts have been increased in recent times in India, the urban situation remains critical.

Impact of Covid-19 on Public Health Systems

Though world experienced virus outbreaks earlier in the form of SARS, Ebola, etc., the Covid-19 virus turned out to be more dangerous in terms of rapid spread and ability of the virus to sustain in varied environments and adapting fast. In fact, the Covid virus has taken world into its grip threatening lives of people and making governments struggle to control and deal with the problems. The worst affected are the health systems which are fragile in the developing countries.

As per the Indian Constitution, mainly states are responsible for public health. But, with 73rd and 74th Constitutional Amendments, public health has also become the function of the local governments—municipalities and panchayats through the 12th and 11th Schedules. Cities, therefore need redevelopment as well as extension of basic civic services in developing areas. This has become a herculean task for urban authorities. The primary health centres lack basic facilities and medicines to treat the patients.

If ULBs provide basic sanitation and primary health care systems in urban and rural areas, the state governments can develop specialised and general health hospitals on a bigger scale, especially in the major cities. In line with privatisation, health facilities are also privatised in India leading to mushrooming of private hospitals in cities and towns. Whenever seasonal diseases like flue, cholera, etc., increase, public and private hospitals find it difficult to cope with the demand.

The weak government monitoring by state agencies has become bane of poor performance of public health system. Lack of facilities and even medicines have become common problems in government hospitals. Unfortunately, public health systems are largely under-funded and understaffed. On the other hand, administrative corruption thrives, taking advantage of the monitoring lapses. Health scams have become order of the day in India. In the circumstances, the outbreak of dangerous virus like Covid is a great challenge to the governments.

Covid-19 is not a normal health problem. It is a pandemic affecting the entire population. It goes beyond the local and even state governments. It is a disaster and in Indian federalism, disaster management does not find place in any listed functions between the Centre and the states. The Union has the powers to legislate on the unlisted subjects under Entry 91 of the Union List.[8] Further, the Entry 29 of Concurrent List makes Centre and states responsible for preventing spread of infectious diseases across the states and regions in the country. Added to this, the Union Government has also powers to give directions to the states in case of internal disturbances and external threat. Covid

is considered as an internal threat arising out of health emergency in the country. Due to amendments to Article 352, emergency cannot be declared by the Centre. Under these circumstances, the Government of India utilised the old pre-independence period Act called, Epidemic Diseases Act, 1897 and the National Disaster Management Act, 2005 enacted under Concurrent List. The National Disaster Management Act empowers the Centre to give directions to the states under security subject. The Covid virus pandemic was thus dealt under different provisions by the Government of India. The management of disaster is normally the responsibility of the states. Thus, the legal provisions indirectly helped the Central, state, and local governments to cooperate in dealing with the issues of Covid in India.

Impact of Covid Virus on Economies

The rapid spread of virus across the countries covering the entire globe, not only affected the health authorities concerned, but also on the economies of countries. The emergency health conditions led to imposition of lockdowns strictly curbing movements of people across regions and within the towns and cities. This has forced industries and business establishments including retail sellers to shut. In the process, if several people lost employment, the companies lost productive period incurring heavy losses. The worst affected are people working in informal sector and migrant labourers. The governments across the countries came forward to support unemployed and poor people to survive in difficult times. But even the governments cannot support the people as their own coffers get reduced due to halt of economic activities.

The economists warned that longer close -down of production and business activities will lead to severe recessions and hunger. But life is more precious and important. The governments preferred life to livelihood in the initial period. But the realisation has come slowly, and governments started easing lockdowns opening the economy. In the meantime, the repercussions of the lockdowns started showing in multiple ways. If unemployment led to psychological problems and family disturbances, reduced incomes compelled people to curtail their spending restricting to the necessities. Less spending led to less business even after opening of the businesses. Even governments reduced their spending due to decreased incomes. Reduced GDPs and increasing government budgetary deficits are other important challenges facing the governments.

As people are still in the grip of Covid virus spread, recovery of economy appears to be very slow spanning into years to gain normal

status. The spread of virus into different regions and the consequential work disturbances are affecting the businesses and production activities. It appears that till long-term solution of developing vaccines becomes a reality, the uncertain situations will continue to bother the economies and governments.

Social Impact of Covid Virus

Social isolation is the order of the day during the Covid times. Isolated working and living have become new lifestyles. Man is a social animal and social isolation is a big threat to a healthy society. As Covid virus is infectious and spreads fast in communities through physical contact, isolation is suggested by the health authorities including the WHO. Loss of jobs are making people depressed. Psychologists are advising people to develop positivism to deal with isolation problems.

In India, reports are abounding that the Covid virus fear brought radical change in social relations. Communities are isolating Covid-infected people and families. It is distressing to hear the news that even family members are not coming forward to take the dead bodies from hospitals for last rites due to fear of virus. The social bonds are strong in Indian families. But the virus fear created panic behaviour among people affecting the normal social relationships. The governments are imposing restrictions on family and social gathering. This has affected the marriages and other ceremonies in Indian families where number of people gather and share. At present, nobody has ready answers to the critical problem of isolated living. It demands new relationship pattern—that is learning to maintain relationships even from distance. Going beyond the traditional beliefs, relationship in distance should be the new norm in Covid times that is, physical isolation but socially-related. This requires mental change. It is really a big challenge in traditional countries like India.

On education front, the shutting of educational institutions has created problems for students. Online education is being promoted as an alternate method. Though this may be workable in case of college students and high school students, it is not advisable for the kids. As there is no alternative, students are forced to adopt these methods. Educationists are divided on the efficacy of the method. Distance learning promoted for working people has now become inevitable for all students.

The distance living, distance working, and distance learning have become new social norms. Though this may be a temporary phenomenon, it may have long-term impacts on people—their relationships, minds,

and lifestyles. People should quickly adopt to these lifestyles for better social living.

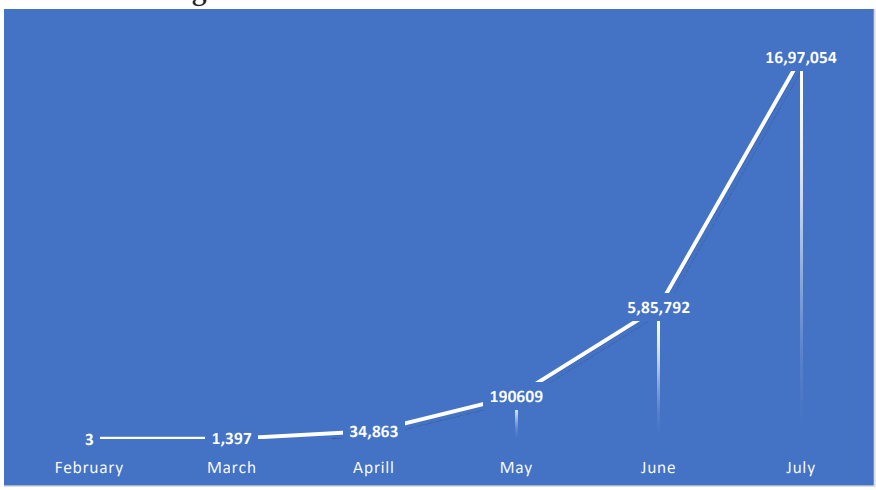
STATUS OF COVID VIRUS SPREAD IN INDIA

The survival of the Covid virus in humans depends mainly on the mutations in their genetic structure. Unfortunately, the virus has successfully mutated and survived in different regions. This has led to spread of Covid virus across regions and populations. Whether the Covid pandemic is fatal to human life is debatable and there are different related issues and deciding factors. Apart from this discussion, the main aspect is wider spread of the virus infections across communities. Even mild infections create health issues and lead to isolation. If isolation is neglected, virus will spread more rapidly affecting others.

The Covid-19 virus arrived in India in February 2020 itself. In February, the total cases in the country were merely three. While recognising the impending crisis, the country level lockdown was imposed in last week of March after the *Janata Curfew* on March 22. Since then the spread of virus was controlled to a large extent. Later, it appeared that the decision for lockdown and travel restrictions were a bit late as the damage had already been done during February and March due to some lapses in international screening and allowing a religious meeting at Markaz in February in Delhi which included thousands of foreigners. Some of these foreigners were already exposed to Covid virus in their countries, hence acted as virus carriers. Conducting meeting with thousands of members was a wrong decision which became a perfect platform for spread of virus among the members. As these people travelled to different parts of the country after the meeting, it led to spread of the virus across the country.

Despite these lapses, the virus spread was under control due to total lockdown. But, with the easing of lockdown controls since June, people started moving freely without proper care like maintaining social distance and wearing masks outside homes.Now, it has spread to such an extent that some call it, community spread in several regions in the country. Further, nearly 80 per cent of the confirmed cases are asymptomatic. The community spread and asymptomatic cases make people frightened to venture outside. The rapid spread of virus after the lockdown easing is evident from the progression of the virus spread in India. The virus confirmed cases which were just three in February, increased to 1,397 by March 31 before lockdown. During lockdown also there was gradual increase to 34, 863 cases in April 30 and 1,90,609 in May 31. But after lockdown easing, the cases spiked to 5,85,792 in June 30 and hiked to 16,97,054 in July (Fig. 1).[9] The rapid hike in the

Fig. 1: Growth of Covid Virus cases in India

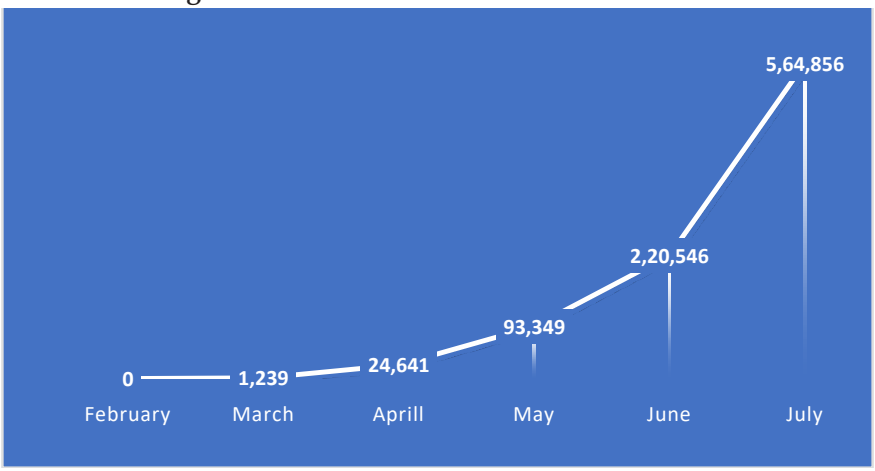


Source: Worldometers.info

number of cases over two times in June and three times in July is clear from this data.

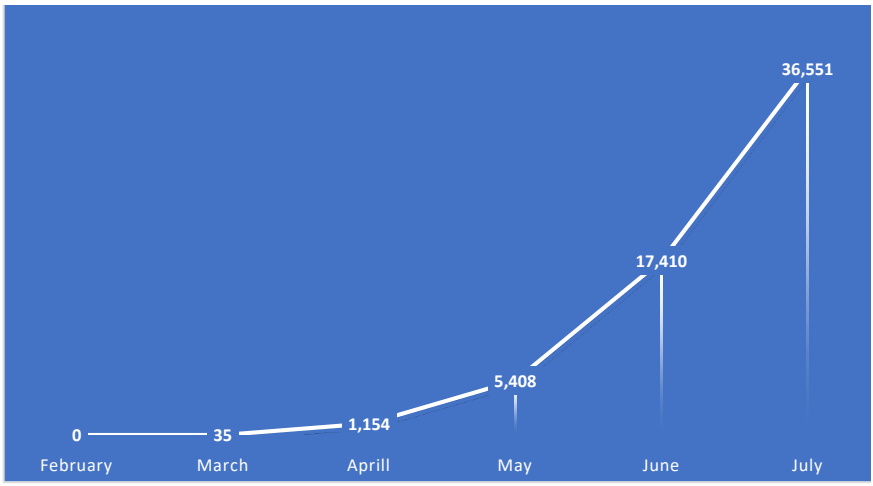
Along with the total cases, the active cases also increased. The cases which were 1,239 in March, increased to 24,641 in April and to 93,349 in May. After lockdown easing, the number increased fast to 2,20,546 in June and hiked to 5,64,856 in July (Fig. 2). The increasing active cases put more pressure on the health administration and the hospitals. Similar increase is also witnessed in number of fatalities due to virus infections. The deaths which were 35 in March increased to 1,154 by April and to 5,405 by May. After the lockdown easing, the deaths increased to 17,410

Fig. 2: Growth of Active covid Cases in India



by June and 36,551 by July (Fig. 3). The fatality rate, however, has been low ranging from 3.2 per cent to 2.2 per cent.

Fig. 3: Growth of Covid deaths in india



State Level Scenario in India

The Covid virus has spread to entire India covering states and Union Territories. However, the spread is not uniform across the country. Five states namely, Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka and Delhi are worst affected as per the data reported on 9th August 2020 contributing to roughly 61 per cent to country total. The top ten states contributed about 81 per cent to country total (Table 1). Maharashtra tops the country list with 23 per cent contribution to the country followed by Tamil Nadu with 13 per cent. In case of active cases too, Maharashtra leads in country with 6.8 per cent (Table 1).

Delhi which topped in the early months has been improving well in July due to concerted efforts of state authorities. Health facilities were upgraded as per the need. More testing and tracing victims helped in taking appropriate measures to isolate them.

In India, the high recovery rates and low death rates are the comforting numbers. As against the national average of 68.7 per cent, five states namely, Delhi, Tamil Nadu, Gujarat, West Bengal, and Telangana reported above country average figures (Table 2). Delhi reported about 90 per cent recovery rate, a commendable achievement. The reason could be that the recent measures have started giving results. The Karnataka has picked-up only in July reporting thousands of daily cases. Till July, Karnataka had reported lesser cases which were in hundreds only. The country fatality rate is two per cent. As against this,

TABLE 1: STATUS OF COVID IN TOP TEN STATES—TOTAL AND ACTIVE

Sl. No.	*State*	*Confirmed Cases*	*Country Total*	*Per cent in Country*	*Active Cases*	*Per cent in Country*
1	Maharashtra	5,03,084	21,55,847	23	1,47,355	6.8
2	Tamil Nadu	2,90,907	21,55,847	13	53,481	2.5
3	Andhra Pradesh	2,17,040	21,55,847	10	85,486	4.0
4	Karnataka	1,72,102	21,55,847	8	10,667	0.5
5	Delhi	1,44,127	21,55,847	7	79,773	3.7
6	Uttar Pradesh	1,18,038	21,55,847	5	46,177	2.1
7	West Bengal	92,615	21,55,847	4	25,486	1.2
8	Telangana	79,495	21,55,847	4	22,869	1.1
9	Bihar	75,786	21,55,847	4	14,432	0.7
10	Gujarat	69,986	21,55,847	3	26,694	1.2

Source: mygov.in, Government of India, figures as on 03-08-2020.

TABLE 2: STATUS OF COVID IN STATES---RECOVERY AND FATALITY RATES

Sl. No.	*State*	*Total Cases*	*Recovered*	*Recovery Rate*	*Deaths*	*Fatality Rate*
1	Maharashtra	5,03,084	3,38,362	67.3	17,367	3.5
2	Tamil Nadu	2,90,907	232618.0	80.0	4808.0	1.7
3	Andhra Pradesh	2,17,040	1,29,615	59.7	1,939	0.9
4	Karnataka	1,72,102	89,238	51.9	3,091	1.8
5	Delhi	1,44,127	1,29,362	89.8	4,098	2.8
6	Uttar Pradesh	1,18,038	69,833	59.2	2,028	1.7
7	West Bengal	92,615	65,124	70.3	2,005	2.2
8	Telangana	79,495	55,999	70.4	627	0.8
9	Bihar	75,786	48,673	64.2	419	0.6
10	Gujarat	69,986	52,927	75.6	2,627	3.8
	Country Level	21,55,847	14,81,473	68.7	43,465	2.0

Source: Covid Statistics, Microsoft, Bing.[10] The data as on 09-08-2020.

highest fatality rate of 3.8 per cent is reported in Gujarat. Bihar on the other hand reported lowest fatality rate of 0.6 per cent (Table 2). Further, Maharashtra, Delhi, West Bengal, and Gujarat reported above national average figures. Interestingly, the recovery rate is above national average in Gujarat, West Bengal and Delhi.

Status of Virus at City Level

The WHO and ICMR reported in May that 70 per cent of cases and deaths are occurring in the 13 major cities viz., 1) Mumbai, 2) Delhi, 3) Kolkata, 4) Bangalore, 5) Hyderabad, 6) Chennai, 7) Thane, 8) Pune, 9) Ahmedabad, 10) Indore, 11) Jaipur, 12) Jodhpur, 12) Chengalpattu 13)

Tirunelveli. This clearly brings out the relation between human densities and the Covid spread. A news report[11] brought out that five cities viz., Mumbai, Pune, Delhi, Ahmedabad, Chennai, and Jaipur contributed 50 per cent of the corona virus cases in India. Recently, Hyderabad and Bangalore are also picking up the momentum. The ICMR India assessment further states that the risk of Covid virus spread is 1.89 times more in slum areas in cities. All this indicates that the cities with higher densities are more prone to rapid spread of corona virus. The dynamics of virus spread are changing fast.

The status of virus spread in million plus cities indicates that the top ten million plus cities contribute to about 36 per cent of country total. Delhi, Mumbai, Pune, Chennai, and Thane reported over one lakh cases each (Table 3). The city of Thane is just outside the Greater Mumbai. If Mumbai and Thane are combined, their share in country comes to11 per cent. The urban concentration is more pronounced in respect of the state shares of the cities. Delhi state is totally urban. The state share of virus infections in other cities ranges between 56 per cent (Hyderabad) and 22 per cent (Thane). The burden of active cases is high in Pune and Bangalore cities with 41,256 and 33,727 cases respectively. The recovery and fatality rates are better in cities too. The Delhi recovery rate is 90 per cent followed by Chennai (87 per cent) and Ahmedabad (81 per cent). Bangalore reported least recovery rate of 52 per cent. The average recovery rate in these cities works out to 72 per cent. The fatality rate is low in India and the situation is same in cities too. The fatality rates range from 5.9 per cent (Ahmedabad) to 0.3 per cent (Kamrup Metro). In Mumbai also the fatality rate is high that is 5.5 per cent.

The above statistics are provided only to trace the trends of Covid virus spread in Indian cities. The cities played major role in spreading the Covid virus across the globe. As the data provided is district-wise in India, the information should be taken only as indicative. In fact, if the peripheral areas which are fast urbanising in India are also taken into consideration, the urban bias will be more pronounced. As the Covid virus is a developing story and the virus is spreading in rural areas in India, the dynamics may change over the time, but the urban bias largely remains.

INDIAN STRATEGY TO DEAL WITH COVID VIRUS-SUCCESSES AND FAILURES

The sanitation and health facilities maintained by the ULBs faced unprecedented pressure of work during the virus outbreak. On the one hand, the Covid virus has clearly brought out glaring deficiencies of the ULBs and the governments in meeting the pandemic demands,

TABLE 3: STATUS OF COVID CASES IN TOP TEN MILLION PLUS CITIES

City	*Confirmed Cases*	*State Nos.*	*percent in State*	*Country Total*	*percent in Country*	*Active Cases*	*Recovered*	*Deaths*	*Fatality Rate*
1. Delhi	1,44,127	1,44,127	100	21,54,028	7	10,667	1,29,362		2.8
2. Mumbai	1,22,316	4,41,228	28	21,54,028	6	20,211	95,354		5.5
3. Pune	1,09,988	4,41,228	25	21,54,028	5	41,266	66,089		2.4
4. Chennai	1,08,124	2,57,613	42	21,54,028	5	11,737	94,100		2.1
5. Thane	1,03,642	4,41,228	23	21,54,028	5	22,944	77,737		2.9
6. Bangalore	72,237	1,34,819	54	21,54,028	3	33,727	37,292		1.7
7.Hyderabad	43,348	77,513	56	21,54,028	2	11,345	31,694		0.7
8.Ahmedabad	27,745	63,562	44	21,54,028	1	3,722	22,393		5.9
9. Kolkata	27,241	75,516	36	21,54,028	1	6,980	19,334		3.4
10. Kamrup Metro	18,473	57,715	32	21,54,028	1	7,086	11,336		0.3

Source: Covid Statistics, Microsoft, Bing.[12] The data as on 09-08-2020.The actual data may vary slightly based on reporting timing in states. Hyderabad data sourced from a local daily.[13]

on the other hand, India has shown much spirit and made coordinated efforts to tackle the emerging problems. The medical facilities like beds, testing equipment and paramedical support was mobilised to tackle the problem. Covid hospitals and facilities like new wards, kits, technical support, etc., in the hospitals were upgraded to treat the Covid patients which involved special care and isolated treatments. The strategy of total lockdown as recommended by the WHO was imposed in March last week itself as an emergency measure.

This curtailed the movement of people in cities and towns. The police departments were streamlined to monitor the lockdowns strictly. The doctors, police, public health staff of the ULBs and the other health workers took main burden of the Covid virus problems. These were considered warriors to fight Covid virus. The central and state political leadership also gave top priority to tackle the Covid virus. Frequent political and administrative level consultations between Centre and the states and concerned agencies at the state level were done to monitor the situation. The state health departments played a significant role in coordinating various other agencies involved like ULBs, hospitals (both public and private), police, and district administration. In the beginning, the lockdowns, strict controls on movement of people, tracing the contacts and helping the patients reach hospitals, designating containment zones and hot spots across the country for close supervision, etc., gave good results as the spread was controlled effectively.

Initially, the virus was transmitted through international travel. Therefore, screening of the international travellers helped identifying affected persons and quarantining them for at least 14 days which is considered incubation period for show of symptoms. Later, the virus spread continued across India due to some lapses in screening the international travellers. The famous Nizamuddin Markaz religious event in Delhi involving thousands of foreign nationals and Indians was organised which led to wide spread of the virus after the event. National and international flights were totally banned to control transmission by air travel. The international travel ban is carried-out for long period. The rail and bus travel were also banned.

From Lockdown to Unlocking—The Emerging Scenario

Though local level measures like closing down schools and colleges and banning congregation of people in public places were taken in cities like Hyderabad in the beginning, the national level lockdown was imposed in the last week of March 2020. The national lockdown was not done in a planned way. It was a sudden decision by the Government of

India. The sudden lockdown had put tremendous pressure on the state authorities to respond immediately. Slowly, the states came to terms and cooperated with central decision.

In India, urban migration for livelihood has been a steady process and reached high levels over time in large cities. The migrant workers became the backbone of various government and private sector projects. Bulk of the migrant labourers live in slums and sometimes on the project sites themselves with temporary shelter. The sudden lockdown had put tremendous pressure on the migrant labour. The commercial establishments, companies and construction works were closed leading to loss of livelihoods. To mitigate their hardships, the Central and state governments provided free monthly ration. Some voluntary organisations provided free food to jobless poor people. Despite these measures, some workers could not receive the benefits and there was growing pressure among the migrant workers to return to their native places to be with their families in difficult times.

As all the businesses were closed, many shopkeepers could not even give rents. The governments were the worst affected financially as all their income sources depleted fast with the lockdowns and some governments like Telangana and Andhra Pradesh could not even pay salaries to their employees. Employees and their families had to satisfy with half salaries only. All government works came to standstill.

The lockdowns caused much hardships to all—people, workers, industries, and governments. The Indian economy was slowly drifting toward recession. However, every country—developed and developing, has faced this economic problem. Being a developing country, India could not bear the burden of lockdowns long. The Government of India started unlocking the economy. One after the other, all businesses were opened. Presently, only international travel, educational institutions, marriage halls and large people congregations have yet to be opened.

It appears that not much preparatory work was done before unlocking the economy. The consequences of opening were not assessed properly and taken care of with a clear strategy and action plan in many states. The medical infrastructure and facilities remained fragile despite some improvements done during the initial period. The lockdowns were lifted without streamlining health systems. The removal of lockdowns and the opening of the businesses led to free movement of the people on the streets, especially in the cities. Many intellectuals opined that the governments should have eased lockdown restrictions more slowly while assessing their impact and taking necessary remedial measures at each step.

People as usual ignored the safety measures like maintaining social distancing and wearing masks in public places. Some influential people behaved irresponsibly by organising large birthday parties and other functions. Though congregation of people was not allowed, some irresponsible people managed to break the rules leading to widespread of the virus. It was visible that states were in a hurry in unlocking while people felt relief from controls and carried out their businesses as usual.

The initial spirit, discipline and commitment, which were displayed earlier, dissipated fast. The governments shifted their attention from Covid to other areas. The health machinery slowly adopted a casual approach. This led to deficient functioning of health system causing severe problems to the Covid victims. Each organisation started functioning in its own way. The casual and sometimes callous approach on the part of the public authorities has replaced the earlier spirit of concern for Covid victims.

Most of virus victims with mild symptoms and no symptoms are put under home isolation. It is reported that people are not following isolation rules and roaming freely outside. This is another problem not taken seriously by authorities concerned. As a result, virus spreads freely in the communities.

All this led to the spread of Covid rapidly, overburdening the fragile health system. It is unfortunate that though some improvements are made to major hospitals, the status of primary health centres is very poor. In Hyderabad, it is reported that there is only one primary health centre for two lakh people as against the national norm of one primary health centre for 25,000 people[14]. Added to this, there are gross inadequacies in respect of qualified technicians and doctors to provide necessary medical services during the Covid times. As the primary health care is in doldrums, people are either flocking to big hospitals or private hospitals. The biggest problem appears to be asymptomatic Covid victims. Many people do not even know that the virus attacked them as they do not see any health issue. Such people without knowing, transmit the disease in the community. The doctors and scientists say that 80 per cent of people do not show any symptoms. The spread of disease by such people is also another big problem especially to their families and the people to whom they have close contacts. The doctors say that the most unfortunate Covid victims are people having other health issues like blood pressure, sugar, cancer, etc. The fatality rate is high among these victims.

Another area of concern is the functioning of the private hospitals. The governments have allowed private hospitals to test and treat corona

patients. Unfortunately, the private or so-called corporate hospitals started exploiting the patients by charging very high rates compared to government prescribed rates and creating artificial shortages of medicines and facilities. Due to lack of strict monitoring over them, the private hospitals continue to exploit people in multiple ways. The media is continuously bringing out this issue. Recently, thousands of complaints were received by the Government of Telangana on this problem and government is taking some measures to control the private hospitals.

On 12th June, the Ministry of Health, Government of India reported that the rate of corona virus spread is coming down steadily in India. It was informed that the daily growth rate which was 38.2 per cent in March 2020 had come down to 3.24 per cent by 12th July 2020. Further, it is stated that much of the Covid virus spread that is 86 per cent of the active cases are confined to ten more affected states with Maharashtra and Tamil Nadu contributing to about 50 per cent of the cases. Karnataka, Delhi, Andhra Pradesh, Telangana, West Bengal, Uttar Pradesh, Gujarat, and Assam contributed to 36 per cent of active cases. It is also said that the recoveries are overtaking daily cases in many states and in entire India by 1.8 times.

Against this rosy statistical information, the fact remains that the virus is spreading fast not only in the cities but also in the rural areas which were safer till now. This is another emerging problem in India. The emerging numbers indicate this problem. The number of daily cases in country which was below 8,000 before lockdown easing in May, increased to over 19,000 in June, and 50,000 by July and the present figure is about 60,000 on 9th August. The state level figures also indicate this trend. As per analysis done by *Indian Express* daily[15], the rate of increase of cases in July over June was considerable ranging between 35 per cent in Delhi to 89 per cent in Andhra Pradesh. The Karnataka and Bihar states also come in the higher range 80-87 per cent (Table 4).

COVID CONTROL INITIATIVES

International Experience

At the global level, some countries like Germany, New Zealand, South Korea, Singapore, etc., successfully controlled the Covid spread. The effective strategies normally adopted by the governments were mobilising local level health facilities, better coordination and monitoring of Covid activities, testing, better contract tracing and isolation methods. Counties like India, Australia and USA followed lockdowns as a measure to control the Covid virus. But Taiwan controlled the Covid virus effectively without adopting to disruptive lockdown approach.

TABLE 4: INCREASE OF CASES IN TEN SELECT STATES IN JULY

Sl. No.	*State*	*Total no. of cases*	*Addition in July*	*Per cent Increase in July (in per cent)*
1	Maharashtra	4,22,118	2,47,357	58.60
2	Tamil Nadu	2,45,859	1,55,692	63.33
3	Delhi	1,35,598	48,238	35.57
4	Andhra Pradesh	1,40,933	1,26,338	89.64
5	Karnataka	1,24,115	1,08,873	87.72
6	Uttar Pradesh	85,461	61,969	72.51
7	West Bengal	70,188	51,629	73.56
8	Telangana	62,703	46,364	73.94
9	Gujarat	61,438	28,992	47.19
10	Bihar	50,987	40,999	80.41

Source: Indian Express, Sunday, August 2, 2020.

The cases of Taiwan and New Zealand are discussed further to highlight their strategies, which are well appreciated globally.

Taiwan-case of Undisruptive Initiative

Taiwan is a small island country like Hongkong and Singapore. It has just about one million population. The most important point here is that Taiwan is just 130 km away from China where the virus generated having active travel connections with China. In the light of its proximity and work connections with mainland China, it was expected that the country was more prone to Covid virus reminding the SARS 2003 experience. In 2003, Taiwan had highest mortality rate in the world. The earlier experiences might have warned Taiwan to take strict measures and strategies in the early stages itself. Result of these early strict measures is seen in the low Covid virus infection in the country. The country had just 455 confirmed cases including seven deaths as on 19th July 2020.[16] The globally appreciated strategies adopted are explained here.

Early Containment Measures and Border Control

Because of earlier SARS nightmare, the country has woken-up early on the day China reported the corona virus case to WHO on 31st December. Most of the other countries including USA at that time downplayed the issue and were not expecting it to spread into their countries on a significant scale. Another positive aspect was that the Covid response team was led by the experts. The Vice-President Chen Chien-jen himself is epidemiologist from Johns Hopkins University with much experience in tackling the earlier SARS virus. The Vice-Premier

Chen Chi-maiis a doctor himself and it was reported in Channel News Asia (CAN) on December, 31 that he had early knowledge of a typical cases of pneumonia virus which prompted him to take early responses to the emerging crisis. By January, 20, Taiwan's Central Epidemic Command Centre was activated.

Initially, the travellers from China were screened in early January 2020 itself. After thorough checks at airports, affected travellers were quarantined for 14 days strictly. Further, national health insurance data was integrated with the immigration database while allowing this data to all the hospitals treating the virus.[17] When the first confirmed case of Covid virus was reported, travel alert to Wuhan was alerted and travel from Wuhan and Mainland China was banned on 26th January, 2020.[18] As the virus started spreading across countries like Hongkong, Singapore and Malaysia travel of non-residents of Taiwan was totally banned.[19]

Avoiding Shortage of PPE Kits and Masks

Effective measures were taken to prevent shortage of PPE kits and masks in hospitals. The supply chains were monitored strictly, and the prices of the essentials were totally controlled. Purchases of masks by people was rationed to avoid shortages. The manufacturing of masks was increased from two million per day to 16 million per day. The ban on surgical mask exports was also imposed against WHO advice.

Dedicated Clinic for Covid Patients

In the Chang Gung Memorial Hospital, separate Covid clinic was established exclusively for the Covid patients with total isolation from other units. Apart from these, testing facilities were expanded. For this purpose, 50 regional hospitals and medical centres and 167 community hospitals and clinics were designated to test the patients. Special wards for Covid patients were also provided in these medical centres for treating patients.[20]

Effective Utilisation of Technology

Digital health technology was used very effectively. The Chang Gung Memorial Hospital was provided with business intelligence (BI) to monitor healthcare of the patients by identifying the Covid risk patients and isolating them to control the spread. Further, with the help of smart phone technology, quarantined patients were effectively monitored.

At the outset, these measures appear to be common being followed by other countries. The real difference is the early measures and strict implementation of the strategies on the ground. Controlling the virus

spread without resorting to total lockdown is another achievement of Taiwan. It shows how strict the controls were. Finally, the citizen cooperation has been commendable.

New Zealand—The Case of Early Action

New Zealand is an island country with a population of 4.9 million in 2019 and has very less density of 17.3 persons per sq km. The success of Covid virus control in that country is really inspiring and a lesson to others. The early and strict measures in the beginning of February 2020 itself were the key points there. The strictness of the measures and commitment of the government is visible from the point that when just two cases were reported in New Zealand in June due to control breaches, the Health Minister resigned taking the responsibility. The main points of the strategy adopted in the country are outlined below.

Early International Travel Ban

The country started banning foreigners coming from or via China, the very next day when a person died of Covid virus in Philippines on 2nd February 2020. Any New Zealander coming from China was put to 14-day compulsory quarantine. At that time there were no corona cases in New Zealand. It is really a great early precautionary measure when the other countries were taking Covid virus issue lightly.[21] The moment first case was registered in New Zealand from a person coming from Iran, travel ban was extended to other countries like South Korea, Iran, etc., where the virus spread was observed. And from 16th March, except virus safe countries, all travellers were to go compulsory self-isolation on arrival. Later, after few days only an unprecedented measure was taken by the New Zealand Prime Minister Ms Ardern to close all international travel ban to all foreigners and residents too. This early measure largely stopped virus migration from other countries.

Early National Lockdown

The national level lockdown with four-stage alert system was introduced in the country when the country just had 102 cases with no deaths reported on March 25 as against UK the country had over 6,500 cases and 330 deaths when the lockdown was imposed in the country. Further, UK never closed borders except bringing self-isolation controls. It was argued that the country had to bear economic pain but the country experienced virus free and healthy life compared to other countries.

Proper Utilisation of Lockdown Period

The lockdown was used for conducting extensive testing and contact tracing for the virus. The victims were detected early and isolated

for treatment. Though opposition leaders criticised the total lockdown for long periods, government continued the strategy. Interestingly, it is reported that 80 per cent of the people supported the government measures. The Prime Minister announced officially on June 8 that the country has successfully eliminated the Covid virus from the country at least for the time being.

Though the country experienced few cases later due to some lapses after lifting the lockdown, the situation is far better compared to the other countries which are still struggling. The international travel is still closed. Though critics lament on long period of travel ban, the country at least achieved success in controlling Covid virus spread in the country.

INDIAN EXPERIENCES

Dharavi, Mumbai—The Unique Success Story

Mumbai is not only the financial capital of India but also a most populated metropolis in the world. Even with geographical limitations, the city expanded wherever possible. The city grew into a large urban agglomeration with a population of 12 million population, occupying 8th place among the most populous cities in the world. The metropolis of Mumbai is the second biggest metropolis in India and includes cities of Navi Mumbai, Thane, Bhiwandi, and Kalyan apart from the Greater Mumbai. The UN estimated that the metropolis had a population of 25 million in 2014.

One of the main contributory factors for the rapid spread of Covid is considered the density of population in the cities.In Mumbai, the density of population is very high with approximately 73,000 people per square mile as against Tokyo with 11,000 people per square mile and New York's 6,000. In Asia, Shanghai has around 3,600 people per square kilometer as against 28,000 per square kilometer in Mumbai. More significantly, the slum of Dharavi has mindboggling density of 3,34,728 people per sq km or 869,565 people per square mile. This statistical information is given only to show the level of density in Dharavi, a great risk factor for the spread of Covid virus.

The famous Dharavi, Mumbai's biggest slum is also considered largest in Asia. It has over 10 lakh population. Density in Dharavi is about six times more than the other areas in Mumbai. The slum is very congested with mixed residential and commercial activities. About 80 per cent of people use community latrines and the streets are very narrow. Almost each home has small business. With these factors, it was feared that the Covid outbreak in the slum may assume unmanageable dimensions.

But amidst fast growth of corona virus in other regions of Mumbai and Maharashtra, the Dharavi with several adverse civic exigencies, managed to control the Covid spread in the slum to a great extent. This is evident from the following growth figures. In Dharavi[22], the daily growth was 12 per cent in March, which got reduced to 4.3 per cent by May, 1.02 per cent by June, and to 0.3 per cent afterwards. The sustaining growth reduction is really a stupendous success in Covid control. No doubt, the initiative of Dharavi and the strategies adopted are appreciated widely in India and even the WHO praised the controlling measures.

In Dharavi, the strategy included several local measures taken more effectively. The following specific measures were taken to control the pandemic.

- The foremost was aggressive testing and screening covering about 85 per cent of the people in the slum. This has helped in tracing the potential Covid victims. After tracing, rapid survey was done covering 3.6 lakh people to identify old people. About 8246 old people were identified and isolated for special care.
- Another measure was setting-up fever clinics to identify the potential Covid patients.
- Developing necessary medical facilities and health staff was done locally. For this support of private sector was sought. About 90 per cent of treatment was done mostly in the local facilities.
- The other facilities like transporting the patients to the hospitals was also provided in local areas.
- As most of the people lived in very small tenements, home isolation was not feasible. To overcome this problem, several community level isolation centres were developed to isolate the people.
- Community participation is very important in the local level initiatives. Interestingly, local communities readily provided the needed support. To interact with communities, Covid community leaders were identified who bridged the gap between the local people and health workers.

The case of Dharavi is a model for other cities with high slum populations for in most cases the initiative stops with planning in India. Such well-planned and executed strategies are needed in other cities also to control the spread of corona virus till the effective vaccine is produced and provided to all the needy people.

Kerala—The Case of Un-Sustained Initiative

In Kerala, large number of people migrated to foreign countries for employment. As people started coming back due to corona virus in other countries, the imported corona virus danger was imminent. The state foresaw such danger and made effective strategies to face the emerging problem. Kerala is the first state to experience the corona virus problem in India on January 30.[23] The state took effective measures like isolating the patients, contract tracing, quarantining the people coming from abroad which was the main source then, and streamlining the medical and hospital facilities and technical staff in the state to meet the health needs of the people. The earlier two Nipah outbreaks guided the authorities to take early action on the Covid virus. The decentralised local government system in Kerala helped the authorities to control the virus. These measures were carried out more vigorously. The mobilisation of resources from different departments was done to support the ground activities. Active people's participation, community kitchen to feed the poor, rationing of essentials and psycho-social counselling to alleviate victims stress were other supportive measures which worked well. With these measures Kerala could control the spread of virus to a large extent. In April, the Covid cases were only 1,823 which increased to 8,380 in May. On May 4, there were just 16 active cases in the state.

The Kerala story gets reversed in the subsequent months. With the easing of lockdown controls, the Government of India started the repatriation missions to bring back Indian workers struck in other countries. Kerala has large number of people working abroad. As influx of people was expected, the Kerala government wanted to test the returnees at the airports itself to control the virus import. As this could not materialise, multilayer screening was adopted to identify and isolate the infected persons. The influx of migrant workers which started on 7th May increased to over a period. The influx already reached the six lakhs figure. The state and local authorities struggled to provide isolation centres to the migrant workers. In the meantime, there developed a shortage of testing kits. The tests were restricted to only the highly risky sections of the people. Several types of tests like RT-PCR, antigen, antibody, TrueNat, CBNAAT, etc., were introduced to cover all the people having influenza like symptoms. The influx of people from other regions accentuated the problem. The mitigation measures are being increased in recent days. With the resurgence of Covid virus, infections from unknown sources surfaced in Thiruvananthapuram. Another cluster of Covid virus developed in Malappuram taluk. The virus has steadily increased in the state. This is evident from increase in the cases to 18, 522 in June and to 55,078 in July. It appears that the

lockdown easing effect was also experienced in Kerala. The positive aspect is restricting the death cases in the state to about hundred.

Delhi-Well-Controlled Initiative

Delhi experience shows that it is the reverse of the Kerala experience. Delhi is the capital of the country and hence needed increased efforts to control the Covid. But initially the state administration showed laxity which led to spread of the Covid. The incident of Markaz where several thousand foreigners assembled for religious purposes triggered the virus spread not only in Delhi but across the other states. The Delhi authorities could not cope with increasing spread of the disease due to coordination problems. The daily rate of growth was around six per cent in June.

With the support of the Central Government, the state took some effective measures to control the rapidly spreading disease. The medical infrastructure facilities were upgraded with developing a large medical facility in the Sardar Patel hall. This facility has 10,000 beds with latest medical equipment and facilities to cater to the demand of all the patients. The important measure was increasing the number of tests from 4-5 thousand daily to 20 to 25 thousand. This helped the authorities to trace the corona patients early and treat them in time. Another innovative measure was setting up of Plasma Bank to meet the needs of patients. Plasma treatment has shown some positive results in India in treating the critically ill patients. This facility has helped the plasma therapy on Covid patients. This practice is being followed in other states too in India.

With all these stringent and coordinated measures, the virus spread is controlled. For instance, the daily growth rate has come down from six per cent to 1.7 per cent by July.[24] The recovery rate is also increased to over 90 per cent. Resultantly, the recovery numbers are more than the daily detected cases. These initiatives must be continued further to control the Covid virus spread.

The above experiences reflect the responses of governments to cope with Covid virus problem and to control its spread. Smaller countries like Taiwan, Singapore, Hongkong and New Zealand have responded more effectively achieving sustainable results. Even bigger countries like Germany, Canada and Australia have done reasonably well in limiting the Covid virus spread. USA, Russia and UK in the developed world and countries like India, Iran and Brazil in the developing regions are still struggling with the Covid crisis. Each country followed its own strategy based on local economic, political, and social conditions and limitations. The initiatives and experiences so far reveal the changing

dynamics. If some countries like New Zealand and Taiwan succeeded in controlling the virus spread, other countries displayed mixed results. In India, controlling efforts varied from state to state. If Dharavi is a unique case of Covid virus control in an extremely adverse conditions, the experiences of Kerala and Delhi are typical. Kerala experienced earlier success which reversed during the later period. At the other end, Delhi which suffered fast virus spread in earlier months, took effective control measures, and succeeded in July. The current world picture shows that only few countries have been successful in controlling virus spread while others are experiencing different stages of up and down. The main lesson that emerges from this dynamic experiences is that as long as the effective administrative measures were put in place strictly, virus spread was controlled and the moment people and authorities became complacent, the virus surged again. The constant alertness and sustenance of strict measure are therefore essential till effective vaccine is developed.

Road Ahead

Covid 19 virus is a developing story. Everyday new knowledge and information is flowing across the globe. As the virus is behaving differently in different countries, each country has a story to tell. In India, if cases are on increasing trend, some are hoping that it may help in developing herd immunity among the people. Their argument is supported by increasing asymptomatic cases in the country.

In May, the Indian Council of Medical Research (ICMR) had done a study to find the anti-body levels in communities in 83 select districts covering 21 states which were affected. The antibodies were found only among 0.73 per cent of their sample. The virus antibodies are indication that the persons were affected by virus and developed antibodies. Recent studies done indicate substantial increase in the percentage of people with antibodies. Asero survey was done in Delhi by the National Centre for Disease Control (NCDC). It conducted the IgG antibody and infection survey using COVID KAVACH ELISA which is approved by Indian Council for Medical Research (ICMR) during June 27 and July 10. The survey was done across 11 districts in Delhi covering 21,387 cross section of people. It was found that 5,022 of the sample had developed antibodies against COVID-19.[25] This indicates a figure of 23.48 per cent which by implication is said that 44.6 per cent of Delhi population would have developed antibodies. Some private testing labs have also done the antibody tests on public. The Thyrocare, a private testing lab has found antibodies in 1,340 of the 3,956 samples it tested, indicating a positivity rate of 33.8 per cent in Delhi. In Mumbai, two private labs namely, Thyrocare and Suburban Diagnostics Lab conducted the antibody

tests in Mumbai. Thyrocare had tested 5,485 samples in the city came to conclusion that 1,501 or 27.3 per cent of the samples had antibodies. The Suburban Diagnostics lab also found that 830 or 20.2 per cent of the 4,105 people it tested had developed antibodies against COVID-19. Another Serological Surveillance for Sars-cov2 study such survey was done in three wards covering 7,000 people in slum and non-slum areas.[26] The results show that 57 per cent of people living in slum areas have developed antibodies as against 16 per cent in non-slum areas. These people have no symptoms of the virus but developed antibodies, perhaps infected earlier. Experts feel that the Covid virus has mutated and became less viral in India. These studies prove that the Covid virus does not harm much in majority cases. Other reason could be that more and more youngsters who work and move outside homes in the age groups of 30-50 years are getting infected and most of them remain asymptomatic. This is proved to be true as per a study by health department, Government of Telangana. It was observed that 47 per cent Covid victims were in the age group of 21-40 years and another 18.7 per cent in the age group of 40-50[27]. One danger is that these people may spread virus affecting old people in their families. Similar trends were reported in other countries too. This is another ticklish problem arising out of Covid virus.

Another aspect relating to spread of the Covid virus is testing. In respect of testing, USA stands first in the world as the country conducted over 60 million tests whereas India conducted over 20 million tests as on 3rd August 2020. Some argue that number of cases are increasing in the countries because of increased testing. The antibody tests indicate high levels of prevalence of the virus spread. In respect of testing too, the percentage of cases turning positive indicates the level of virus spread in broad terms. In India, the percentages are between 15 and 20. In states like Tamil Nadu, Andhra Pradesh, and Telangana where number of tests is on the rise, the percentage of positive cases also increased. In USA too, in some states like Florida where virus is spreading fast, the percentage of positive cases which were about 3.5 during May increased to 18.7 by July. The purpose of all the antibody and rapid testing is to identify the positive cases and assess the levels of virus spread across the community. These measures will only serve surveillance of the spread and caution the public authorities to take appropriate measures to curb the spread. Large number of people may be asymptomatic not requiring hospitalisation. But along with the spread of the infections, number of people requiring hospitalisation also increases which puts more burden on the existing health infrastructure and services. The shortage of beds and ventilators have become frequent occurrences. Every country faces this problem and in developing countries like India, it will be more critical.

The increase in the antibodies among people and increase in the asymptomatic cases is a tricky issue having positive as well as negative dimensions. The increasing trend supports the herd immunity argument as most of these affected people are asymptomatic. The negative side is it indicates increasing spread of the virus among people. These dilemmas remain in future too. Though pharma industry and scientists are racing to find vaccine as soon as possible to mitigate the sufferings of people, the effectiveness of these vaccines remains a question mark.

In the meantime, living with Covid virus demands changing life and work styles. New patterns of work will emerge focusing on social distancing, work from home and digitalisation. This is happening not only in the IT sector but also in other sectors like industry and offices. As the virus spread is expected in waves with occasional highs and lows, isolated temporary lockdowns become necessary to deal with the situation in the areas where the virus spread becomes unmanageable to the authorities. This is already happening in India. Hence, the industries and offices should be ready with alternate plans to continue their businesses and reach targets. This will be a stupendous task as they face disruptions from the workers who get affected by virus and the occasional lockdowns.

At the other end, virus goes on spreading from urban to rural areas due to movement of people between rural and urban areas. Covid virus is travelling along with people to secondary cities and rural areas. This is already visible in India. The rural areas where health facilities are very poor, the spread of virus creates more severe problems to the people and authorities responsible to deal with it.

Unfortunately, people continue to suffer from the virus. In countries like India, poor responses from authorities are common. Private hospitals on the other hand keep busy in searching for opportunities to make money. All these problems put people to much hardships and personal loss. Hence, people should become more responsible instead of just fighting with the overburdened and unresponsive authorities, strictly follow the minimum health directives given by the authorities and should take adequate personal care like wearing masks, avoiding crowd, and maintaining physical distance.

As the uncertain situation continues till a reliable vaccine becomes a reality, the governments should continue the efforts and maintain the system set-up for tackling the Covid virus problem with same tempo. The following administrative measures are essential to tackle the Covid problem in an effective and sustainable manner.

1. The action plan should always be ready with dedicated teams

with necessary staff and technical skills at national, state, and local levels.

2. Involving the experienced NGOs is essential as these organisations could work more effectively on the ground maintaining good rapport with local communities.

3. Almost all countries, developed as well as developing are facing shortage of essential medical equipment. Though the governments have improved to some extent during Covid crisis, there is still lot to be done. Especially, the shortages are a big problem in the populous countries like India as governments serve a greater number of people. News reports are flowing daily in India about the poor facilities and services in the government hospitals. Even the doctors are complaining against shortage of essential staff, equipment, and facilities. The situation demands upgradation and more spending on the medical necessities in tune with the demand.

4. Apart from upgrading and increased spending, more important issue in India is effective monitoring of Covid operations. Many a time, problems arise due to neglect and lack of proper coordination among the agencies concerned. Lack of coordination is the bane of Indian administration. Authorities prefer to blame others whenever a problem arises than functioning responsibly. Integrated and shared work patterns among the concerned authorities are essential to deal with critical situations.

5. Private hospitals operate on corporate methods and profit motive. This is their normal functioning. Unfortunately, certain inhuman practices are being followed in some hospitals taking advantage of usual slackness in monitoring. As a result, Covid patients are left to face much hardship and exploitation. Denying admissions to the needy patients under different pretexts and charging exorbitant rates ignoring the government fixed rates are the complaints pouring across the country. This is a dangerous problem and should be corrected by strict monitoring. In times of health emergencies like Covid virus, governments should adopt stringent approach. Strict monitoring is utmost important to ensure that the private hospitals follow minimum standards and rates fixed by government.

6. The most important aspect is sharing of vital Covid information across the authorities in the country. The IT which is

aggressively adopted in private and public offices should be appropriately used for Covid activities and monitoring. In India, the e-governance has become a catchword. It is good that government operations are being digitalised for efficiency. But the utilisation of these IT models depends on the people manning the system. If it is effectively used by people, it could yield the results and reversely if not properly used. IT is only an administrative aid, by just installation it itself cannot yield the desired result unless authorities utilise it effectively and rightly. India has long way to go in this respect. In the emergency situations like Covid crisis, information sharing is vital for timely and right decisions. The IT enabled Covid models have enormous scope here. It is imperative that India adopt this approach vigorously and benefit from it.

7. In federal countries like India, the national level governments can devise guidelines, monitor state-wise, provide technical and financial support to the states and take such other measures like ensuring enough PPE kits, surgical masks and ventilators are supplied to the needy states. The success ultimately depends on how effectively the state and local authorities are delivering the health services on the ground. Every state should prepare its own action plan and implement it strictly. Unfortunately, governments prepare good plans, but their implementation suffers. Unfortunately, this casual approach is seen even in Covid crisis management in India. In health emergency times, the governments should adopt crisis management approach rather than following as usual approach. Proper resource mobilisation--financial and human, providing necessary medical kits, strict monitoring of all Covid activities including private hospital monitoring and frequent consultation across the concerned authorities on day-to-day basis are essential to deal with emerging Covid crisis effectively.

Finally, the countries which are doing well in crisis management are controlling the virus better compared to other countries. This is evident from the experiences of Taiwan, South Korea, and New Zealand globally and from certain local initiatives as discussed in this paper. The struggling countries and regions could either follow these well-appreciated models or devise their own innovative models to control the Covid virus spread and mitigate the problems of the people till a permanent medical solution emerges. Ultimately, administrative wisdom tells us that well-planned and executed strategies and, cooperative and sustained initiatives are a success mantra in Covid virus control.

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Mobilisation of Financial Resources in Lucknow Municipal Corporation: Status, Trends and Issues

U B SINGH*

ABSTRACT

Lucknow is a historical city. Its administration owes its genesis to British days. It is, however presently the largest city in most populous state of Uttar Pradesh. Being the state capital, it enjoys distinctly placed status and position. Lucknow Municipal Corporation is a leading municipal corporation in the state. It strives hard to become the role model for others. Its revenue balance is encouraging. With a financially strong base, the corporation has initiated to access the capital market through floating municipal bond with an aim to invest for improving its infrastructure network. Keeping this in view, this study aims to assess its financial resources and to review its spending pattern.

Keywords: *Revenue, Municipal Bond, Centralised Management System, Citizen-centric*

INTRODUCTION

Lucknow is the largest city in Uttar Pradesh. Earlier it was the second one after Kanpur, the old industrial hub of the state. However, in 2011, Lucknow surpassed Kanpur in urban content. Being the capital city, Lucknow commands a respectable status among the Municipal Corporation towns in the state. It is a leading municipal corporation and the present state government wants it to develop as a role model, as former Prime Minister late Shri Atal Bihari Vajpayee was an ex-officio member of the Lucknow Municipal Corporation. After the launch of the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), a mega reforms-based project, the government selected two municipal corporations — Lucknow and Ghaziabad — for floating municipal bonds. Lucknow Municipal Corporation has since gone

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far ahead in this direction. Through this bold step, the Corporation demonstrates its operationally stable financial health and the ability to repay capital purpose loans. The move by the Corporation has motivated the deliberative wing and city-dwellers as well to be pro-active. This beginning has led to a change in the mindset that cost on provision of services should need to be met through rational pricing and cost recovery. It has shown the high motivation level on part of municipal administration to adopt innovative management system.

In this backdrop, it becomes imperative to study the financial status of the Corporation for assessing its financial health, fiscal environment and identifying issues in its financial resources mobilisation and trends in establishment and development expenditures. The analysis is based on the data provided by municipalities every year to the Directorate of Urban Local Bodies which compiles and places it before the state legislature in the budget session. This is the only reliable source of data available in public domain.

Historical Background

Lucknow, the 'City of *Nawabs*' is the capital city of the most populous state of Uttar Pradesh. It is also the administrative headquarters of the eponymous district and division. It continues to be an important centre of governance, administration, education, medical, commerce, aerospace, finance, design, culture, tourism, music and poetry. Earlier it was nicknamed as the Golden City of India, Constantinople of the East, and *Shiraz-e-Hind*. Historically, Lucknow was the capital of the *Awadh* region, controlled by Delhi Sultanate, *Sharqi* Sultanate, Mughal Empire and later the *Nawab* of *Awadh*. In 1856, the British East India Company abolished local (*Nawab*) rule and took complete control of the city along with the rest of *Awadh*, and in 1857, transferred to the British Raj. One of the *Nawab's* enduring legacies is the region's syncretic Hindu-Muslim culture that has come to known as *Ganga-Jamuni Tehzeeb.* Lucknow, along with Agra and Varanasi, is in the Uttar Pradesh Heritage Arc, a chain of survey triangulations created by the state government (LMC; Wiki).

Demographic Profile

Lucknow is an old and dynamic city. As per 2011 census data, Lucknow consists of about 16 per cent of the state's urban contents. A little less than one percent of the country's urban population is found inhabiting in the city. In the last century (1901-2001), the city's population grew about nine folds. So is the case with its municipal area. In view of its rapid peripheral development, the state government, in December 2019, decided to extend its area and 88 villages were

brought within its boundary. The municipal limit has now extended to 568 sq. km (government source). As a result of expansion in area, a tremendous increase in its population has been recorded in the city. Lucknow Municipal Corporation and Lucknow Cantonment Board constitute urban agglomeration. The demographic profile of the city is compiled in Table 1.

TABLE 1: DEMOGRAPHY OF LUCKNOW CITY

Year	*Area (sq. km.)*		*Population (lakh)*		*Decadal Population Growth (%)*	
	MC	*UA*	*MC*	*UA*	*MC*	*UA*
1871	NA	Not existed	2.84	2.84	-	-
1881	NA	-do-	2.61	2.61	(-)8.3	-8.3
1891	NA	-do-	2.73	2.73	4.5	4.5
1901	NA	-do-	2.56	2.64	(-)6.2	-3.3
1911	NA	-do-	2.52	2.60	(-)1.6	-1.6
1921	NA	-do	2.40	2.41	(-)4.8	-7.4
1931	NA	-do-	2.51	2.75	4.6	14.2
1941	NA	-do-	3.54	3.87	41.0	40.9
1951	NA	-do-	4.44	4.97	25.4	28.3
1961	NA	-do-	5.95	5.95	34.0	19.8
1971	NA	127.66	7.49	8.14	25.9	36.7
1981	114.11	145.94 (14.3)	9.16	10.08	22.3	23.8
1991	282.50 (147.6)	337.50 (131.3)	16.19	16.69	76.7	65.7
2001	349.00 (23.5)	414.30 (22.8)	22.07	22.46	36.3	34.5
2011	350.00 (0.3)	415.00 (0.2)	28.17	29.03	27.6	29.8

Source: Compiled from various Census Reports of India: Historical Census of India archived from the original on 17 February, 2013.
MC- Municipal Corporation; UA-Urban Agglomeration NA-Not Available
• Figures in parentheses show the percentage increase in area

Civic Administration

After the abolition of *Nawabi* Rule over Lucknow, the Britishers constituted, in 1860, a Local Committee under the Deputy Collector to run the city administration. In December 1861, the Commissioner upgraded the Committee as Municipal Committee, which, in 1884, was made Municipal Board, the second one in the state after Kanpur (which was constituted in 1861). The United Provinces (present Uttar

Pradesh) Municipalities Act was promulgated in 1916 and, in December 1916 Barrister Nabiullah was elected as the first Indian to head the local body. In 1948, the U.P. Government superseded the local body and B.D. Sanwal, ICS, was appointed as Administrator to the post. Subsequently, in 1959, the Uttar Pradesh Municipal Corporation Act was promulgated and Lucknow Municipality was elevated as Lucknow Municipal Corporation on February 1, 1960 and Raj Kumar, Advocate, was elected its Mayor. On February 1, 1966 Municipal Corporation was again brought under Administrator rule. On February 4, 1968 elections were held and Dr. M. M. S. Siddhu was elected as Mayor. State government again superseded the Corporation on July 1, 1973, and put under Administrator rule. After the third elections held and on August 26, 1989, Dr. Dauji Gupta was elected as Mayor for the full term of the Corporation. Earlier the term was one year. After coming into effect, the 74th Amendment to the Constitution (CAA), 1992, fresh elections were held in November, 1995 and Dr. S.C. Rai was elected as Mayor directly through universal suffrage for five years. He served for consecutive two terms. In 2007, the post of Deputy Mayor was abolished by the state government. In subsequent elections Dr. Dinesh Sharma was elected twice for the coveted post. In latter, part of his second term, he was appointed as a Deputy Chief Minister to U.P. Government, and a senior corporator was appointed as acting Mayor. After municipal elections were held in 2017, Smt. Sanyukta Bhatia was elected as Mayor (first woman in Lucknow on this coveted post), and is still continuing (LMC).

The municipal area is divided into 110 wards each electing a corporator. In addition, 10 members are nominated by the state government. Local MPs (*Lok Sabha*), *Rajya Sabha* members, MLAs and Members of Legislative Council are the *ex-officio* members of the Corporation. Thus, the current Corporation consists of 142 members in all (LMC).

The executive powers of the Corporation vest in Executive Committee consisting of twelve members elected by the Corporation out of elected corporators in accordance with the system of proportional representation by means of the single transferable vote by secret vote. One-half of the members retires every succeeding year. The Mayor is Chairman of the committee. One of the members is elected as Vice Chairman.

In pursuance of the 74th CAA, the provision has been made to constitute Ward Committee in every ward. The rules have been formulated, but Ward Committee has been still waiting to see the light of the day.

The wards are consolidated in eight administrative zones for facilitating efficient services to the citizens besides implementing the provisions of the Act.

INSTITUTIONAL CAPACITY

The CAA, 1992 has multi-pronged strategy of democratic decentralisation (ensuring regular elections after every five years); administrative decentralisation (defining functional domain, and constituting ward committee); and fiscal devolution (ensuring regular availability of funds for development). This move impacted local government units in several ways. The presence of elected representatives has brought forth the citizen's expectations and aspirations to an extent. The urban local governments, in general, however, lack institutional capacity for performing functions entrusted to them. The literature on municipal capacity building suggests that capacity building is driven, among other things, by three factors: human resource development; organisational development and institutional and legal framework (Pellenburg et al., 1996). These three important parameters together contribute to strengthening of financial resource mobilisation, financial management system and hence raised fiscal capacity (Jha: 2003).

Municipal Organisation

Municipal Corporation is an autonomous organisation. It consists of two wings—deliberative and executive. Deliberative wing consisting of Mayor and Members (elected, nominated, and ex-officio) is responsible for formulation of policy for city development; whereas Executive wing comprises at head the Municipal Commissioner (an officer from Indian Administrative Service or a senior officer belonging to State Administrative Service) and a number of state government officers serving on deputation, and officers belonging to U.P. *Palika* Centralised Services; besides a huge number of supporting staff. Support staff is locally recruited and not adequately skilled. Majority of them are illiterate in handling modern technology. Most of the employees at the lowest level are stubborn and not amenable to change. There is a need to have a relook for making the Lucknow Municipal Corporation capable in applying the modern administrative techniques and technologies to make it a lively, dynamic and efficient organisation.

The Municipal Corporation Act, 1959 provides for constitution of ward committee (in compliance to the 74th CAA), and accordingly rules were framed by the state government; but these committees have still not been given a shape. The need and importance of ward committee are well known. Besides performing decentralised functions, the ward committee acts as a tool for encouraging community participation. It is

difficult to diagnose where the fault lies. Either party seems unconcerned about this provision of the Constitution. It is high time that the state government should step in and get these committees constituted at the earliest.

Keeping rapid expansion and growing population of the city in view, the government may consider either upgrading the Corporation as Greater Municipal Corporation with functional ward committees, or create a new Corporation for the new city area. The pattern of Municipal Corporation of Delhi may be replicated. Administrative decentralisation as envisaged by the supreme law of the land for ensuring efficient and qualitative civic services and also for making the civic administration citizen-centric present a good case of its upgradation. It would be proved helpful in optimising local resources as well by the Corporation.

Human Resource

There is a band of officials in the Corporation exclusively responsible for tax administration. It includes the Chief Tax Assessment Officer, Tax Assessment Officer, Superintendent, Assistant Tax Superintendent, and Revenue Inspector (all belonging to centralised revenue service) and scores of supporting staff. Unfortunately, their functional responsibilities are not codified. Moreover, law empowers the Municipal Commissioner to delegate powers to officers as per requirement. Presently, a number of revenue officers are entrusted with the administrative responsibilities, as large number of administrative posts is lying vacant. Many-a-times, this hampers tax imposition and collection. Municipal Commissioner, however, has to manage the city administration with available limited officers, without any choice. In case of any emergent situation, the organisation would work under increased pressure. This is not a good situation for a healthy organisation responsible for providing essential services to city-dwellers. The government should fill all the vacant posts without delay and take necessary steps to man the Municipal Corporation with adequately skilled persons belonging to municipal cadres only. The deputationists at middle ladder will not serve the purpose of the Corporation.

Legal Framework

The U.P. Municipal Corporation Act, 1959 provides a number of revenue sources (tax and non-tax). It comprehensively provides the ways and means of effective and foolproof tax administration. The rules necessary for implementation of these provisions of the Act are framed by the state government, time and again. The Act empowers the Corporation for enacting delegated legislations—bye-laws.

FINANCIAL RESOURCES

The initiation of new economic policy in the country in last decade of the twentieth century led to a shift towards market economy to accelerate the process of urbanisation and urban growth (concentrated demographic growth in larger urban centres). As a result, the cities are called upon to increase their revenue enhancement effort for financing augmentation of municipal services and urban infrastructure for improving the quality of life of urban population, and attracting investment for generation of employment and income. The institutions of urban local self government having been therefore, occupying the centre-stage and are called upon to manage change, brought about by increasing demographic growth within their jurisdiction. An effective, efficient and responsive discharge of the devolved functions and management of change requires institutional and fiscal capacities in ample measure. On the contrary, the units of urban local governments (ULGs) especially in the developing and transitional economies have been experiencing serious fiscal stress (Bahl and Linn 1992; Bahl 2000; Jha 1998). Indian economy is not an exception to it. Most of the urban local government units in the country have been fighting tooth and nail to cope with their financial shortage.

Revenue Structure

Revenue from own sources constitutes the most important indicator of financial wherewithal of any level of government. The U.P. Municipal Corporation Act, 1959 provides for a wide range of financial resources. These sources may be categorised as internal (revenue resources) and external (capital). Internal sources consist of Tax sources and Non-Tax sources. Tax sources may be further divided into two-- Obligatory (Mandatory) and Optional. External sources include devolution from Finance Commissions (Central and State), grant, programme and project, loan, municipal bond, CSR, Local Area Development Fund, PPP, local resources, etc. The Lucknow Municipal Corporation receives Central financial assistance as well for implementing projects under AMRUT and Smart City Mission.

(1) Compulsory Taxes

(a) Property Tax

(b) Tax on non-mechanical vehicles, other conveyances plying for hire or kept within city or on boats moored therein, and animals kept within the city

(c) Tax on helicopters or other planes

(d) Tax on trades and professions

(e) Tax on deeds of transfer of immovable property

(f) Tax on vacant land

(a) Property Tax

It is a composite tax levied on buildings and land. It consists of four taxes. The aggregate rate of these taxes ranges between 22 per cent and 32 per cent of the annual value. Constituent taxes can be imposed as: general tax (10 to 15%); water tax (7.5 to 12.5%); drainage tax (2.5 to 5%); and conservancy tax (not more than two per cent). Lucknow Municipal Corporation levies these taxes as under:

(i) ***General tax***, generally known as House tax, is levied at the rate of 15 percent of the annual value of the building or land or both;

(ii) ***Water tax*** is levied in the areas where water is supplied by the corporation at the rate of 12.5 percent of the annual value of the property;

(iii) ***Drainage tax*** is levied in the areas provided with sewer system at the rate of 2.5 percent of the annual value of the property;

(iv) ***Conservancy tax*** is leviable in the areas in which the Corporation undertakes the collection, removal and disposal of excrementitious and polluted matter from privies, urinals and cesspools at the rate of two percent of the annual value of the property. This tax is not levied in Lucknow.

General (House) Tax

Property tax is levied on annual value of property (building and land or both) situated within the Corporation limit. Annual value means in case of railway stations, colleges, schools, hotels, factories, commercial buildings and other non-residential buildings, twelve times the value arrived at on multiplying with multiplier to be fixed in the monthly rate of rent per square foot (unit rate) of residential buildings with the covered area of the building or open area of the land or both. In the case of residential building, annual value is twelve times the value arrived at on multiplying the carpet area of the building, or the area of the land, by the applicable minimum monthly rate of rent per square foot of the carpet area or land. The monthly rate of rent or unit rate is fixed once in every two years by the Municipal Commissioner. He derives the monthly rate keeping in mind the location of the building or land, nature

of the construction of the building, the circle rate fixed for area by the District Magistrate for the purposes of the Indian Stamp Act, 1899 and the current minimum rate of rent in the area for such building or land.

(i) Classification of Properties

(a) Location

Each ward is divided on the basis of width of the roads as under:

- Less than 12 metres
- 12 metres and more but less than 24 metres
- 24 metres and more

(b) Nature of Construction

- *Pucca* building with RCC roof or RB roof
- Any other *pucca* building
- *Kachcha* building (i.e. all other buildings not covered in above categories)

(c) Use of Property

- Solely residential
- Solely non-residential (commercial)
- Mixed use (residential and commercial both)

The carpet area (internal measurement) is calculated as under:

(i) Rooms— full measurement

(ii) Covered *Verandah*— full measurement

(iii) Balcony, Corridor, Kitchen and Store— 50 per cent of measurement

(iv) Garage— one-fourth measurement

(v) Bathroom, latrines, portico and staircase- not included

(ii) Calculation of Annual Value (ARV)-- (A) Residential Buildings

Annual Value = Carpet area x fixed per unit area monthly rate of rent x 12 or

= Covered area x fixed per cent unit area monthly rate of rent x 12 x 80 percent

The Corporation through a resolution can determine the annual value of different types of buildings or land as under:

- In the case of land and owner-occupied building which is not more than 10 years old, the annul value is reduced by 25 percent; and if it is more than 10 years but less than 20 years old, annual value is reduced by 32.5 percent; and if it is more than 20 years old, annual value is reduced by 40 percent;
- In the case of residential building let on rent, which is not more than 10 years old, annual value is increased by 25 percent; and if it is more than 10 years but less than 20 years old, annual value is increased by 12.5 percent; and if it is more than 20 years old annual value is not increased.

(iii) Exemption from Imposing General tax

General (House) tax is not levied on following properties:-

- Buildings and lands used for disposal of dead;
- Buildings and lands or their portions solely occupied and used for public worship or for a charitable purpose;
- Buildings solely used as schools and intermediate colleges whether aided by the state government or not, fields, farms and gardens of government-aided institutes of research and development, playgrounds and sport stadium;
- Ancient monuments;
- Buildings or lands the annual value of which is Rs. 360 or less, provided that the owner does not own any other building or land in the city; in the case of a building situated within 30 metres from the sewer line and it has a latrine with arrangements of flushing;
- Buildings and lands vested in the Union Government (only service charge is imposed on such buildings and lands--if all services are provided 75 percent of the House Tax; if half of the services are provided 50 percent of the House Tax; and in case no service is provided 25 percent of the House Tax). In Lucknow service charge on properties of the Union Government is imposed at the rate of 15 percent.
- Owner-occupied residential building constructed on a plot of land measuring 30 sq. mt. or less, or having a carpet area up to

15 sq.mt. provided the owner does not own any other building in the city;

- Residential building which is located in area which has been included in the limit of the corporation within five years or the facilities of roads, drinking water and street light provided in the area, whichever is earlier.

(B) Non-Residential (Commercial) Building

The annual value of the premises used for commercial purpose is derived by multiplying by 1.5 to five times of the annual value calculated as aforesaid. The multiplication factor differs for different categories of economic activities, as classified by the state government.

(C) Vacant Land

The annual rental value of vacant land is calculated as under:

A.R.V.= Plot area x fixed per cent unit area monthly rate of rent in the area x 12 x 80 per cent

Water Tax--Water tax is levied on the buildings or land situated in the area wherein water is supplied by the Corporation. It is not imposed:

- On any land exclusively used for agricultural purposes, unless the water is supplied by the Corporation for such purposes;
- On a plot of land or building the annual value of which is not more than Rs.360 and to which no water is supplied by the Corporation;
- Any plot or building which is not within the radius of 100 metres from the water supply line of the Corporation.

Drainage Tax—It is levied in those areas where sewer line is laid by the Corporation.

(b) Tax on vehicles, boats and animals

A vehicle, boat or animal kept outside the limits of the city but regularly used within the limits is deemed to be kept for use in the city. Following types of boats, vehicles or animals are exempted from levying the tax:

- Vehicles , boats and animals belonging to the Corporation;
- Vehicles, boats and animals vesting in the Union Government;

- Vehicles, boats and animals vesting in any State and Union Government and used solely for public purposes and not used or intended to be used for purposes of profit;
- Vehicles and boats intended exclusively for conveyance free of charge of the injured, sick or dead;
- Children's perambulators and tricycles;
- Vehicles and boats kept by *bona fide* dealers (in vehicles or boats) for sale merely.

(c) Tax on Helicopters

A tax on helicopters or any other type of planes, when they land on or take off from the helipads, airports, airstrips or places made for this purpose situated within the corporation is leviable. The tax so imposed is paid by the airport authority or persons or managers, or director or institution or department or agency involved in the maintenance, management and supervision of the airport, airstrip, helipad or the place. Despite being the obligatory tax, it is not levied by the Municipal Corporation for want of rules to be framed by the state government.

(d) Tax on trades and professions

The state government has put a ban on imposing this tax.

(e) Tax on deeds of transfer of immovable property

In compliance of the state laws, stamp duty imposed on transfer of immovable properties is increased by two per cent. Identical provision exists in U.P. Housing & Development Board Act, 1965 and U.P. Urban Planning and Development Act, 1973 also. The provision is to impose this additional duty under any one of these Acts. In Lucknow city this tax is imposed under Urban Planning and Development Act. All collections resulting from the increase, after the deduction of incidental expenses are equally divided and transferred by the state government to all three organisations (Lucknow Municipal Corporation, Housing Board and Lucknow Development Authority). Lucknow being a rapidly growing metropolis earns a hefty sum through this source without doing much effort.

(f) Tax on vacant land

The tax on vacant land is levied in the manner as laid down for Property Tax. Need is to treat land as a resource. Land values appreciate largely due to improvements brought about by the city governments

through city development initiatives. A separate rule is wanted for levying tax on vacant land.

(2) Optional Taxes

As per provision of the Act, the Corporation may impose following taxes:-

(a) Tax on callings and on holding a public or private appointment
(b) Tax on dogs kept within the city
(c) Betterment tax
(d) Tax on advertisements not being published in newspapers
(e) Theatre tax

(a) Tax on callings and on holding a public or private appointment.

This tax is banned by the state government.

(b) Tax on dogs

A license fee is charged annually on dogs kept within the city. The fee is charged at two rates-- Rs.500 (big dogs), and Rs. 300 (small dogs). However, it is estimated that about half of the canines kept in the city are without a license. The Corporation should undertake a survey and get all the dogs kept in the city area registered. This is not only a source of income but a measure to regulate and control nuisance in the city.

(c) Betterment Tax

Betterment tax is a tax to be charged on the increase in the value of the land comprised in a development scheme put into operation, but not actually required for the execution, or on the increase in the value of any land adjacent to and within one quarter of a mile of the boundaries of such scheme situated within the city. The Betterment tax is an amount equal to one-half of the difference between the value of the land on the date specified in the public notice and the market value of such land. This tax is not levied by the Corporation as it is misconceived with the provision of betterment fee in the other Act.

(d) Tax on Advertisement

After the merger of Advertisement Tax in G.S.T., the Corporation has been charging the fee on advertisements. Every person who erects, exhibits, fixes or retains upon or over any land, building, wall, hoarding or structure any advertisement or who displays any advertisement to public view in any place--public or private, has to pay a fee on every

advertisement. However, a large number of advertisements in the city are said to be illegal.

(e) Theatre Tax

Municipal Corporation is authorised to charge a tax on cinema shows. In view of the government allowing rebate in Entertainment Tax, the Municipal Corporation has a leverage to raise the cinema tax.

(3) Non-Tax Sources

The Act authorises the Corporation to charge following non-taxes:

- Water charge/value: on the quantity of water used by a household;
- Licensing fee: a fee charged on 39 items identified by the state government;
- Parking stand fee;
- Rent etc.;
- User charges;
- Road cutting;
- Fee on other items; and
- Charges on towers

There is no proper mechanism for optimising non-tax sources. Attention is concentrated only on parking stand fee and license fee. Amongst the non-tax sources, all the items are important but User Charges and Water Charge happen to be the most important. User charges are mechanism for cost recovery. Services provided by a public organisation are grouped as: (i) public-goods and (ii) non-public or exclusionary goods and services (wherein users are identifiable and they can be excluded if they do not pay for the use of services). Water supply, sewerage, urban transport (not with the Corporation), solid waste collection, maintenance of parks and gardens qualify for imposition of user charges. Economic rationale of cost recovery entails that user charges have to be based on the unit cost of providing a service (Jha: 2003). Unfortunately non-tax sources are not paid the required attention in the state, in general.

(4) Other Sources of Income

- Municipal property
- Penalty
- Bank interest

Besides revenue sources, the Corporation has a major source of income in its own properties. The Corporation has a large number of properties of its own in the form of market, residential houses, parks and gardens, schools and playgrounds, ponds, etc. However, a good number of its properties either not known or encroached by land-grabbers and land *mafias,* private builders, etc. or lying idle. In recent past with the help of District Administration, the Corporation has regained control of good number of its encroached/illegally grabbed properties. Every effort should be made to get back all the properties. In past, the Corporation has sold out its many residential colonies to its grabber who were not paying rent nor vacating (under the cover of these becoming non-beneficial). Land never becomes 'non-beneficial'. Its value increases with the passing days. The land may be developed as marketing complex under PPP arrangement. The Corporation should review its rent policy. The agreement with the allottees should be fixed for a definite period with progressive rent. Further, house tax should be levied on shops and markets owned by the Corporation but rented out.

The members of higher legislatures who are *ex-officio* members of the Corporation should be persuaded to provide grant from their Local Development Fund for developing the infrastructure meant for community usage. Likewise, local industrialists, businessmen, law companies, private hospitals and schools/colleges, Lion's Club, Rotary Club, commercial houses, etc. should be motivated to adopt/maintain/construct parks, gardens, road-crossings, foot- over-bridge, under-passes, etc. with sole right of advertisement. Furthermore, funding under CSR may be attracted for infrastructure development. These sources may be supplemental only.

The foregone analysis shows that the Municipal Corporation has a wide range of revenue sources and is authorised to impose a variety of taxes and non-taxes. However, implementation of these provisions requires dynamic bye-laws. The existing bye-laws need to be amended and rates revised upwardly. There are many areas which still require rules/ bye-laws. Much has been done in this direction but still much more is required. The elected members and officials should work in unison with sole aim of increasing own income of the Corporation. The citizens should also be involved in this endeavour. The provision of service infrastructure requires huge financial investment.

EXISTING STATE OF FINANCE

There is a constraint of availability of reliable and updated data in municipalities. This analysis is based on the data provided by municipalities and compiled by the Directorate of Urban Local Bodies

and placed before the state legislature every year during budget session. The latest data pertaining to the year 2017-18 only are available in the public domain at the time of writing this paper (data pertaining to following year is awaiting the approval of the government). Revenue from own sources constitutes the most important indicator of financial wherewithal of any level of government, especially urban local government having a shrunken base. Its tax base is dependent on the pleasure of the state government. Octroi (main stay) and *Tehbazari* (tax on market) have been abolished, and now Advertisement Tax merged with GST (without any compensation).

Contribution from Major Taxes

The analysis clearly depicts the supremacy of General (House) Tax in revenue income from own tax sources of the Municipal Corporation. There must be a constant vigil on this source. According to Corporation sources, a good number of properties are still left outside the tax network; there are plenty of examples of under-assessment; and innumerable commercial properties are either not assessed or under-assessed. The city is expanding; new residential colonies and commercial complexes are coming up; but either not handed over to the Corporation or not brought under tax network. There seems administrative laxity at every step: all properties in the municipal area not identified (although many a times GIS survey was undertaken); unit rate of rent is not revised as per provision after two years (an attempt to revise upwardly after a gap of many years witnessed resentment among the tax-payers, hence deferred for a year); valuation of properties sometimes becomes an issue and in some cases shortcomings are reported; and collection is not at all satisfactory. It leads to accumulation of uncollected tax amount every year. Sometimes arrear amount surpasses current tax demand. Last year the state government launched 'one time settlement' scheme for a few months to facilitate the defaulters to clear their tax liability, but it didn't yield much. A regular monitoring mechanism for collection is non-existent. The 'self-assessment system' by citizens has still to prove its wider acceptability. Situation is, however, on way to improvement. The Corporation has made arrangements for online payment. A number of private banks have been roped in, and response is getting momentum, slowly but steadily.

As regards water tax, the trend is not encouraging. Supplying potable water is the only commercial activity now left with the Corporation. It should be managed commercially or at least on the principle of 'no-profit-no loss.' The running cost must be realised from consumers. The independent erstwhile *Jal Sansthan* has now been brought under the fold of the Corporation, but for all the purposes it

still functions as an independent unit. This situation needs to be rectified and it should be made an integral part, in place of a separate entity.

This is the era of advertisements, but the Corporation seems to be unconcerned. The city is flooded with all kinds of advertisements. The mushrooming of advertisements is not converted into proportional productivity. Although a number of legal cases, time and again, restrain the efforts of the Corporation, the administration should come out with some solutions by consulting the advertisers. If dealt with caution and commitment, this source may be proved good earner.

Surprisingly, income from additional stamp duty is huge. The construction activities in the peripheral areas in the expanding city are regularly going uncontrollably. There is a need to develop a mechanism by the Corporation to reconcile the amount of additional stamp duty transferred to Municipal Corporation by the state government with the amount as duty received by the Registrar. There has been reported ambiguity in many cases.

Further, the Corporation should pay serious attention to all other tax sources. It should not be complacent. House tax has certain limitations. Once it reaches saturation, other sources may emerge as potential ones (Table 2).

TABLE 2: CONTRIBUTION FROM MAJOR TAXES

	Percentage to Income from Tax Sources			
	2014-15	*2015-16*	*2016-17*	*2017-18*
House Tax (General Tax)	60.14	61.24	66.95	97.44
Water Tax	37.23	35.53	29.51	-
Advertisement Tax/Fee	2.40	3.00	3.26	2.25
Tax on Cinemas	0.08	0.06	0.07	0.10
Tax on Animals	0.01	0.05	0.01	0.02
Tax on Vehicles	0.14	0.12	0.10	0.19
Other Sources	-	-	0.10	-
Addl. Stamp Duty (percent to total Revenue Income)	11.76	18.59	13.27	29.29

Source: Derived from data furnished before the State Legislature as *Nagar Vikas Vibhag ka Karya Vivaran* (in Hindi) for respective year.

Share of Non-taxes

Non-taxes are linked with the services provided by the Corporation. It is amazing that the city has a large network of water supply but

no commensurate income from water charge (value). The bye-laws mentions that all properties within the radius of 100 metres from the water supply pipeline shall be liable for paying value (charge) of water consumed by them. Measuring the quantum of water consumed is not possible as water supply in the city is unmetered. There is no other way to assess it. The prevalent practice is purely *ad hoc* and unscientific. The Corporation (*Jal Kal Vibhag*, successor of *Jal Sansthan*) classifies premises on the basis of annual rental value in different slabs calculated on the radius of pipes. It calculates water tax at the rate of 12.5 percent of the annual rental value of the premises. Whichever amount between them is more that becomes the liability—the amount of water tax as tax and the difference of the slab amount, if any, as water charge. This unscientific practice needs to be changed. Water Tax is levied for developing water supply infrastructure whereas Water Charge is the value of the water consumed. Both can't be mingled with; both should be levied separately, as they differ in character (Table 3).

TABLE 3: SHARE OF DIFFERENT NON-TAX SOURCES

(Percentage Distribution)

	2014-15	*2015-16*	*2016-17*	*2017-18*
Water Charge/value	9.20	9.20	--	-
Land, Rent	15.94	15.94	0.92	0.86
*Tehbazari**	2.69	2.69	-	0.87
Slaughter House*	0.21	0.21	0.08	-
Licensing	6.32	6.32	0.08	2.03
Other items	65.65	65.65	98.92	96.24

*Scrapped
Source: Derived from data furnished before the State Legislature as *Nagar Vikas Vibhag ka Karya Vivaran* (in Hindi) of respective year.

Further, wherever the Corporation water supply exists, it is sufficient, but people (mis)use the potable water in huge quantity for purposes other than drinking, cooking, washing of clothes and utensils, and bathing. They freely use drinking water for gardening, vehicle washing, road cleaning (in summer), etc. Furthermore, people have privately bored hand pumps and submersible pumps for extraction of underground water. The Corporation should develop mechanism to control this phenomenon and regulate the uncontrolled extraction of underground water (a natural resource), also charge a penalty on spot for misuse of water.

The other major source of revenue under this category is licensing of 39 items. The government should broaden this category and the

Corporation should mobilise its machinery to issue license to growing economic and other activities mushrooming uncontrollably in the city area. It is not only an ever-growing potential source of income but also a measure for checking; and controlling nuisance. The Corporation should tap other non-tax sources, especially user charges.

Income from Internal and External Sources

Income from external sources includes mainly devolution from State Finance Commission (SFC) and transfer from Central Finance Commission. There are many other external sources of income (as discussed earlier). Amount transferred by successive Central Finance Commissions is meant for development of infrastructure. It may be tied or untied grant, conditions are adhered to. As regards State Finance Commission, five SFCs have submitted their reports. The report of the fifth State Finance Commission is under consideration of the state government. The State Finance Commissions (four) have devolved only a share of state revenue income. Neither any additional tax sources have been assigned nor is share of any state revenue transferred to municipalities. The result has been no widening of tax base.

The analysis (Table 4) depicts income from external sources dominate the revenue income, sometimes fluctuating. It should neither be treated as aberration nor an evil trend in local finance, as urban areas are contributing a major share to national/state GDP. Urban Local Governments deserve their fair share in national/state revenue. However, this should not make the Municipal Corporation too complacent to ignore the potential of resource generation from its own sources.

TABLE 4: INCOME FROM DIFFERENT SOURCES

(Percentage Distribution)

Source	*2014-15*	*2015-16*	*2016-17*	*2017-18*
Own (Revenue)	46.70	50.13	50.11	47.30
Grant (Devolution)	53.30	49.87	49.89	52.70

Source: Derived from data furnished before the State Legislature as *Nagar Vikas Vibhag ka Karya Vivaran* (in Hindi) for respective year.

Establishment Expenditure (ESTT. Exp.)

It is heartening that the Corporation is revenue surplus. Almost half of the revenue income is spent on meeting salary and wages of employees (Table 5). It is a satisfactory scenario. The Municipal Corporation thus gets more funds for development of services and

infrastructure. In case of revenue collection falling in a month due to some disaster (as happened currently) or other reasons, the municipal administration would be in deep water in paying salary on regular basis.

TABLE 5: RATIO OF ESTABLISHMENT EXPENDITURE TO REVENUE INCOME

(Percentage Distribution)

Year	*Revenue Income (Rs. lakh)*	*Establishment Expenditure (Rs. lakh)*	*Ratio of Estt. Exp. to Revenue Income*
2014-15	*40736.78*	*22224.42*	*54.56*
2015-16	46731.86	22224.42	47.56
2016-17	64332.31	26274.41	40.84
2017-18	67404.42	36287.09	53.83

Source: Derived from data furnished before the State Legislature as *Nagar Vikas Vibhag ka Karya Vivaran* (in Hindi) of respective year.

Per Capita Income & Expenditure

Further analysis shows that the per capita income from General (House) Tax shows upward increase, however it is much below in comparison to progressive states in the country. Property Tax administration needs a relook. Per capita income from revenue sources also needs proper attention. Per capita total income looks satisfactory because of income from external sources. Rosy picture of availability of more funds for development gets totally blurred, if analysed further. Per capita total expenditure is much less in comparison to per capita total income. A major chunk of the funds shown as expenditure on development activities is spent on operation and maintenance of existing services (Table 6). This indicates low quality of services. Had the quality of construction been good, there is no justification of spending such huge amount on maintenance. Situation requires more transparency and vigilance by administration. Shockingly, a meagre amount is found spent on creation of new services and infrastructure. It warrants a serious look on financial management. Data relating to five services—street lights, roads, buildings and drains, storm water drains, sanitation, water supply and sewerage system has been analysed. Almost all these services are engineering- oriented. This is a case of not dearth of fund, but mere slackness in maintaining fiscal discipline.

One of the reasons may be the non-existence of ward committees. There is no ward infrastructure mapping, no ward planning and no ward budget. In absence, funds meant for development purposes are divided equally among all 110 wards, whether developed, less developed or

undeveloped. This practice may lead to malpractices. This needs to be reformed and made systematic, transparent and need-based.

TABLE 6: PER CAPITA INCOME & EXPENDITURE

	Per Capita Income (Rs.)			*Per Capita Total Expenditure (Rs.)*	*Per Capita Expenditure on Services (Rs.)*	
	House Tax	*Revenue Income*	*Total Income*		*Maintenance of Existing Services*	*Creation of New Infrastructure/ services*
2014-15	279	519	2165	919	03	413
2015-16	472	1466	2925	1504	49	761
2016-17	589	1969	3930	3400	394	2202
2017-18	529	2013	4256	4091	58	2949

• Population projected @25 percent decadal growth over 2011 Population

CONCLUDING OBSERVATIONS

The foregone study may be concluded with relief that Lucknow Municipal Corporation is able to meet its revenue expenditure from its own sources. The Corporation should, however, not show any complacency and tax sources should be optimally mobilised and non-tax sources should be given due attention. Non-tax is directly linked with service and cost recovery of services, e.g. water supply, solid waste management, street lighting (through charge/fee and user charges) is not able to draw adequate attention of the administration. Its importance needs no emphasis. Corporation properties should be identified and made free from encroachment. Urban land is a scarce commodity, hence should be treated as a valuable resource. The Corporation should judiciously spend funds on operation & maintenance of existing capital assets and creation of new of capital assets and maintenance of its human resources. The expenditure performance reveals that funds are available for maintaining the current assets and for creating new assets. This reflects the commitment of the Corporation to provide certain minimum level of civic services to the citizens, in accordance with its obligatory functions and mandates. Quality of assets should not be compromised. There is also a need to pay attention on creation of new capital assets.

The study reveals that the Municipal Corporation is not short of funds, but it requires efficient financial management for maintaining fiscal discipline. It can be ensured by decentralisation which leads to responsibility and transparency. Ward Committees should be

constituted and they may be charged with ward level indexing of available infrastructure and services, ward planning and budgeting, revenue collection, solid waste management, etc. It may be proved an effective forum for citizen participation, as well. The government should rationalise the human resource structure and provide adequate personnel to the Corporation. Last but not the least, municipal organisation should be restructured and developed with modern administrative techniques and technologies. Strong local government makes the nation strong.

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Significance of Enhancing Resilience in the Urban System towards Sustainable Future Cities

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ABSTRACT

The term resilience has been defined as the ability to bounce back or bounce forward. Building resilience in the urban systems is an upcoming research field pertaining to the various challenges posed by the climatic and environmental changes. The resilience of an urban system depends upon the available infrastructure to maintain acceptable levels of functionality during and after disruptive events and to recover full functionality within the specified period of time. Urban Systems are the worst hit in the global environmental change. This present research paper intends to examine the significance of resilience, its challenges and prospects towards future cities. It also makes an attempt in identifying the barriers to resilience and finally concludes with a SWOC (Strength, Weakness, Opportunities and Challenges) analysis in building resilience in the urban system by identifying research gaps, suggesting potential research areas which can be explored to strengthen the prevailing scenario. The paper concludes with the plausible recommendations which ensure feasible resilience, adding a new perspective to the issue of sustainability in the urban system.

Keywords: *Urban Resilience, Sustainability, SWOC Analysis, Urban System*

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INTRODUCTION

The concept of resilience was first used in the field of ecology to enumerate the system's capacity to endure or to retaliate during disruptions. It is of particular relevance to researchers and practitioners working in the field of urban development, where the concept of urban resilience provides insight into managing persistent shocks by raising alarms extensively to prevent the collapse of a system. Resilience has also helped to bridge the gap between reducing the risks of a disaster and adapting to a climate change by focusing on strengthening the functioning of a system during hazards, rather than preventing those hazards from occurring. Urban systems are the worst affected by climatic changes and other impacts. The rapid urbanisation and extremities of climatic conditions are interlinked with the various issues like frequent floods, earthquake, droughts, overexploitation of natural resources, seawater intrusion, untapped rainwater, air, land and water pollution.

Methodology

This research is developed based on the secondary data collected by the authors. The reliable sources of the data are from various government organisations, their published reports and peer-reviewed journals. The purpose of this research has been to analyse the literature available in urban resilience to understand the need, impact and the purpose of the conceptual framework of urban resilience. Relevant data are collected in the present study to understand the concept of resilience concepts towards building sustainable future cities.

Resilience and Sustainability

Resilience focuses not only how the environment retaliates to disturbances that are associated with climatic changes, but also how well they can withstand and re-structure with the growing demands and needs. Sustainability, on the other hand, is defined as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of resilience enhances the viewpoint on the idea of sustainability by reiterating that resilient planning should also be considered while designing for sustainable cities. Various quantitative methods have been proposed for integrating resilience as a component of sustainability. Walker et al. (2010) attempted to include resilience aspects like probabilistic risk analysis in quantifying sustainability. The addition of resilience as a subclause of sustainability was a welcoming start. Becker (2015) further explored this idea with various earth quake prone case studies in New Zealand and inferred that reducing risk leads to increased resilience

and increased sustainability. Seagar (2008) developed a framework for sustainability delving with resilience, reliability, renewal, and safety. Combined framework for sustainability and resilience are also studied by analysing their commonalities. Bocchini et al. (2014) designed a quantitative framework for the combined strategy by analysing the risk and temporal factors.

Dimensions of Resilience

The resilient urban system majorly focused on natural and man-made disasters, climatic and environmental disruptions. The concept of resilience not only includes the dimensions which can withstand stress but also to recover and retaliate by impregnating certain qualities which reduces the vulnerability of a particular shock. The major characteristics of the urban resilient system discerned from the literature are presented in Table 1. The attributes of resilience discussed here are the multifunctionality, redundancy, modularity, interdependence, robustness, adaptability and efficacy prevailing in the urban system. These characteristics not only distinguish an urban resilient system but also helps the authors to understand how well these resilient dimensions can be imbued in the framework devised for sustainable cities.

Understanding the Gaps and Challenges

There are gaps prevailing in understanding the risk as a whole and composite character consisting not only the external disturbances but also the internal characteristics which could be vulnerable to the functional capacity of a system. The term urban risks are not clearly understood or acted upon. The recent examples like the acute water crisis in Capetown and California clearly state that the hazards related to the scarcity of water are still perceived in the rural context until the severity hits. More detailed research on this is vital to enumerate the risks and to identify the required actions. Although the recent policies worldwide are slightly forwarding towards the inclusive risk reduction approach but the laws and funding are more towards the rescue and response measures. Provisions are being made in development plans for risk reduction, but the technical and institutional mechanism in development authorities are still inadequate towards the comprehensive resilient planning approach. Adaptation towards climate change in resilient planning poses challenges of various decision-makers at diverse scale. This demands a comprehensive and inter- or transdisciplinary collaboration in analysing the comprehensive system including all the subsystem: physical, social, economic, ecological, environmental, infrastructural and institutional and their interlinkages, implementation in the urban system by enhancing resilience capacity which is a

TABLE 1: DIMENSIONS OF RESILIENCE

Sl. No.	*Dimension*	*Explanation*	*References*
1.	Multifunctionality	Interlinkages of various functions; Varied response to disruptive situations; Strengthens the economic and spatial capability. Greater the adaptability speeder is the recovery duration.	*Ahern (2011)*
2.	Redundancy and modularity	Optimisation rather than maximisation. Ensures supportive capacity derived from the prevailing components to perform towards similar function during crisis situation so as to respond better, but the failure of one component does not impact/adverse effect on the entire system.	*Fleischhauer, M.*, (2006)
3.	Interdependence	Combined network so as to acquire support from other systems in the network.	*Fleischhauer, M.*, (2006)
4.	Robustness	Ensures the imbuing capacity of a system to strengthen the redundancy and functional linkages within the subsystems during disruptions.	*Ahern (2011)*
5.	Adaptability	Reduces the failure risks, the flexibility of the system from the past disturbances is enabled to absorb and tackle the impacts so as to minimize the loss.	*Martin & Acss (2011)*
6.	Efficacy	Indicate the ratio of energy supplied by the system to the energy delivered. The positive ratio indicates the efficacy of the system.	*Roggema, R* and *Vanden Dobbelsteen*, A 2012

Source: Compiled by the authors.

prerequisite of sustainability. Solutions for sustainability and resilience planning unfold from the inter and transdisciplinary research.

SWOC analysis

The SWOC analysis considering the three major attributes of a resilient system is discussed in Table 2.

TABLE 2: SWOC ANALYSIS

S. No.	*Attributes*	*Strengths*	*Weaknesses*	*Opportunities*	*Challenges*
1.	Linkages with sustain-ability	A close relation to adaptation and risk reduction.	Emphasising the resilience concepts and adaptation towards climate changes without subverting the sustain-ability mechanism	The phase of recovery serves as an opportunity to build resilience	Long term sustainability approaches linked with resilience.
2.	Assessment of resilience	It includes operationa-lising and implementable assessment mechanism with the prioritisation.	Assessing resilience is governed by spatial, temporal factors and need to be monitored effectively.	Assessment tools should be both generalised and also adaptable for context-specific applications.	Delineating the spatial and temporal boundaries.
3.	Institutional mechanism	Integrating resilience principles in the urban system with transparency, accountability. Risk anticipation and scenario-making capacities	Prevailing weak regulations set up and enforcement mechanism.	Inherent trade-offs between prompt adaptation measures versus long-term measures for resilience building.	Maintaining uninterrupted implementation of urban resilience policies on the local policy agenda, given the short-term nature of political cycles.

Source: Compiled by the authors.

RESULTS AND DISCUSSION

The urban system needs to be designed with the capability to resist hazards, the flexibility to retaliate and endure extremities without disturbing the function by recovering quickly from the impacts where Pickett (1992) suggested that the definition of the city's resilience comparing its variations on equilibrium and non-equilibrium perspectives of resilience. In the equilibrium approach, resilience is considered as the system's capacity to return to the equilibrium position, which is very similar to the theory of elasticity. In contrast, the non-equilibrium approach of resilience defined as the ability to acclimatise to the variations and disruptions incurred. Nature, duration of external forces and duration of a system to bounce back also plays a vital role in accessing the city's resilience. Polese (2010) attempted to combine the equilibrium and non-equilibrium aspects of resilience where the resilient cities are planned considering hazards based on the past experiences and system's ability to adjust and adapt.

RECOMMENDATIONS

A brief set of recommendations are summarised by analysing literature for planning a resilient city: Understanding the vulnerabilities, risks and threats posed in the urban system. Assessment of risk in urban system by the subsystem wise is also an inevitable requirement in resilience planning. There is also a need to identify the factors affecting the stability and the instability of these subsystems. The resilient planning involving long term and short-term planning and it must be inclusive of adaptation and mitigation. Defining the mitigation and risk reduction strategies as part of resilience planning. Need for systematic methodology rather than a technique, providing solutions to the formulated problems. System appropriate technique may be employed to deal with the inherent complexities to define the entire set of problems, analysing quantitatively and the change detections in the system. Application of System Dynamic Technique can effectively reinforce resilience as a new paradigm in sustainable development.

CONCLUSION

The concept of resilience is a multi-faceted pertaining to various temporal and spatial analysis. This study tries to shed some light on the relation with sustainability, challenges and resilient attributes analysed with SWOC technique and end with recommendations. The present study also highlights that the underlying attributes under various subsystem are interlinked to devise a resilient system where the resilience has a correlation with sustainability as well. In order to

enhance the suitability of the resilience concept for guiding planning and assessment efforts, it is essential to have a better understanding of its underlying dimensions and characteristics. These interlinkages would be maximised for enhancing resilience in long term planning.

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Policy Approaches in Planning for the Sustainable Compact City in Maharashtra

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ABSTRACT

Cities of the developing world have become the centre of opportunities. The concentration of resources in the cities has led to a major socio-economic inequality between urban and rural life. It is necessary for city planners to find innovative, hybrid and cohesive policy planning approaches for the development of the urban system. Increasing resource constraints and natural calamities had promoted researchers in various fields to inculcate a sustainability approach in their field of research. Compact city policies predominantly focus on mixed-use, accessible, and high-density urban development. It is one such approach to plan for the futuristic requirements of the city. The policies, which are required for the planning of various components of the sustainable compact city need to be understood. This paper takes into account the policy interventions made by various cities in the Maharashtra state. It provides an insight into the policy mechanisms followed in various cities for turning them as sustainable compact city. It will provide a way forward for the promotion of policies associated with sustainable compact city planning.

Keywords: *Sustainable compact city, urban system, policy, resources*

INTRODUCTION

Cities in India and other developing countries act as a primate growth centres for the region. The lack of primary infrastructure like social, commercial, industrial, physical, and residential is a key

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concern for planners of the developing countries[1]. The trends of urbanisation are irreversible. The rate of urbanisation is manifolds due to the economic resource concentration in the cities of the developing world[2]. Estimates denote that 55.3 per cent of the world population lives in cities. The projections propose that by 2030, one-third of the total world population will habitat in the cities[3]. Urban sprawl is a major challenge encountered in the present and future cities. The increase in the use of energy to sustain life in cities with sprawl, and consequent increase in environmental challenges is a major concern. Researchers also state that sprawl can facilitate the supply of affordable housing, increase in employment opportunities, provide cheap and better public services, etc.,[4]. The biodiversity of an urban system declines in terms of qualitative and quantitative aspects with the increase in urban sprawl. The connectivity between various interlinked ecosystems decreases with the increase in sprawl[5]. The sprawling cities result in jurisdiction related issues in operation and management in the local governance. The provision of infrastructure in the cities with urban sprawl results in the increased cost of infrastructure. The travel time required for commuters increases along with pollution and congestion[6].

Crime is related to urban sprawl, it is observed that leapfrog development and sprawl result in an increase in crime[7]. A number of researchers opine that fear reduces with the increase in the integrity of people, perception of unity as a result of compact development and reduces crime[8]. The commercial centres in the core city decline due to rise in the new commercial centres[9]. Forest is an important asset in an urban system, growth of cities in a haphazard manner and urban sprawl result in a decrease in forest resources[10]. Extensive use of the land resource as a result of sprawl results in a decrease in surface water resource[11]. Urban sprawl affects the industrial fabric, Gross Domestic Product (GDP) per capita and population distribution in the urban system[12]. The increase in vehicular traffic leads to air pollution which impacts the historic monuments negatively[13]. Expansion of urban areas negatively impacts the availability of open spaces in cities[14].

In Indian cities, which are a historic facilitator of the compact city have changed the growth pattern to car-driven urban form, as a result of the market economy. This has innumerable backdrops and limitations, as listed above. It is necessary to formulate suitable policies in order to rejuvenate the accessibility, mix of use and social inclusion by maintaining the social, economic and environmental sustainability in the Indian urban system.

The holistic definition of the compact city as suggested by the founders of the concept, Dantzing and Saaty, in 1973, stated a set of

characteristics which a city should qualify to be compact. The three major characteristics are as follows: (i) with respect to urban morphology, the compact city has high-density residential areas, reduced reliance on motor vehicles, and clear boundaries with neighbouring regions; (ii))spatially, the compact city is characterised by mixed land use and a high diversity of lifestyles; and (iii)) the social functions of the compact city include social equality, self-sufficiency of daily life, and independent regional management[15]. In this work, a critical policy review of the cities in the Indian state of Maharashtra is undertaken and discussions are drawn for further research. In this work, we consider Solapur, Nashik, and Aurangabad for the critical review of the policies related to the planning of the sustainable compact city using statutory provision, i.e. development plans of the respective cities. The profile of the study area is as follows:

Solapur

Solapur is located around 17.68°N and 75.92°E in the Indian state of Maharashtra. It has an average elevation of 458 meters from the mean sea level. It is a multi-linguistic, textile hub and sugar and allied industries centre[16]. The population of the city was 9.51 lakh in 2011. The city is 178.57 sq.km. in the area and density of the city is 5329 person per sq.km[17]. The city is connected by air, rail, and road, it is a district headquarter. It is well known for the manufacturing of Indian cigarettes.

Nashik

Nashik is an ancient pilgrim city located around 20.00°N and 73.78°E on the banks of river Godavari, in the Indian state of Maharashtra[18]. It has an average elevation of 584 metres from the mean sea level[19]. It is the wine capital of India, and also an agro-based centre. The population of the city was 14.86 lakh in 2011. The city is 259 sq.km. in the area and density of the city is 5738 person per sq.km[20]. The city is connected by air, rail, and road, it is a district headquarter.

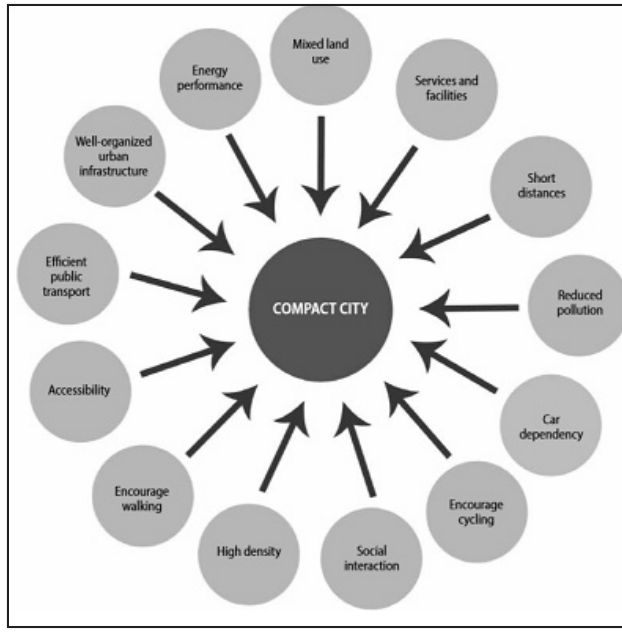
Aurangabad

Aurangabad is a historic city located on the banks of river Kham, around 19.53°N and 75.20°E in the Indian state of Maharashtra. It has an average elevation of 458 metres from the mean sea level. It is a multi-linguistic, multi-culture, mechanical industries centre. The population of the city was 11.75 lakh in 2011[21]. The city is 139 sq. km. in the area and density of the city is 8453 person per sq. km[22]. The city is the capital of the Marathwada region as well as the district headquarter and connected by air, rail, and road. It is well known for the world famous historical monuments in and around the city.

Literature Review

Planning policies in India are primarily influenced by Europe and especially the English, Dutch, French, Portuguese, who had their colonial presence in the past. In Europe, mixed-use and dense urban development are promoted by European Communities[23]. The Commission of the European Communities in 1999, promoted the policies related to the increase in residential densities in its member countries[24]. National Urban Development Policy is a guiding document for the strategic development of the urban system. The National Urban Policy framework by the United Nations promotes cities which are integrated, connected and compact. The planning in this pattern can promote sustainable and climate resilient cities[25]. In the city of Copenhagen, compact development was promoted to ensure the safety of the green belt and limit the sprawling growth by promoting integration land-use and transport modes[26]. The German solar city of Freiburg developed a vertical mix of uses including medical offices, schools, churches, children's play area, and encompass shops[27]. HafenCity in Hamburg used a mix of use as a principal development objective and promoted it as a structural concept for development. It also used density as a planning consideration to promote social inclusion, which is one of the important determinants of the compact city[28].

Fig. 1: Major Elements of Compact City

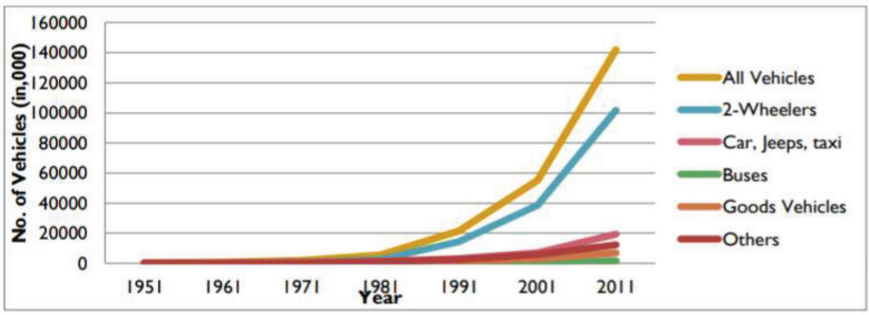


Source: ROGATKA, 2015.

In the post-1991, economic reforms, car-driven settlement planning was promoted in the cities of India, Fig. 2 shows the increase in car ownership after the 1991 economic reforms. Gatos in the name of developing elite apartments promoted car ownership in cities. This phenomenon was also observed in Ireland, as declining residential densities in the core city and increase in the densities in the urban fringe is the determinant of the world's advanced capitalist societies[29]. This indirectly facilitated sprawl, leapfrog development and decreased the possibility of developing public transport in the Indian cities[30]. Research is conducted in various elements indicated in Fig. 2, it shows that the use of compact city policy can promote a reduction in vehicular ownership and thereby results in the development of climate-resilient and sustainable cities by a reduction in Greenhouse Gas (GHG) emissions primarily in the transport sector.

The optimal urban size determination should be given more emphasis on the promotion of energy efficient cities[31]. The research in compact city policy primarily emphasises on cities which are less car-dependent and reduction of losses of valuable land resource in the urban system[32,33]. Social inclusion is possible by making the cities compact, with the effective formulation of sustainable policies.[34]

Fig. 2: Category-wise registered vehicle ownership in India



Source: Centre for Study of Science, Technology and Policy, New Delhi

Policies in the planning of Sustainable Compact cities in Maharashtra

The compact city is a broadly defined set of objectives rather than a single outcome. High density, mix of use and social inclusion are the objectives[15]. We have analysed the statutory policy documents of the cities with similar size and characteristics, in the Indian state of Maharashtra . The policies related to the planning of sustainable compact city are accounted for this work.

Sustainable Compact City Policy in Solapur

In the Solapur city, high-density squatter settlements are growing. The city is characterised by medium rise and high-density housing in the core city and low rise sparse housing in the extended areas. The unplanned density increase is related to the increase in noise pollution in the city, as per studies conducted by Maharashtra Pollution Control Board, Solapur subdivision. The heat island effect is observed in the high-density core city areas and is relatively low in the city peripheries. Transit-oriented Development(TOD) is proposed in order to promote the smooth flow of traffic in the city.

Solapur is among a few cities in the Indian state of Maharashtra, which promote and harvest the potential of mix use development by employing TOD in the city. In 1994, the area under mix use was 0.65 per cent of the total city area, which was proposed to be increased to 6.67 per cent in the year 2017. In the core city, a mixed development existing in the form of residential and commercial use is observed. In the eastern part of city mixed development is developed in the form of small scale industry like cigarette or *Beedi* factory and residential use. Density pattern in the city varies, due to changes in the city limit from time- to- time, as shown in Table 1.

TABLE 1: TEMPORAL CHANGE IN URBAN DENSITY IN SOLAPUR

Year	*Population*	*Area (sq. km)*	*Gross Density (persons / sq. km)*	*Persons per hectare*
1971	3,98,361	23.23	17149	171
1981	5,14,660	25.53	20159	202
1991	6,04,215	33.03	18293	182
2001	8,72,424	178.57	4886	49
2011	9,51,558	178.57	5329	53

Source: Census of India and Solapur Municipal Corporation.

The city has a long tradition of religious harmony and is reflected through various activities organised by different religions, with the involvement of people from diverse religions in the celebrations organised in the city. Solapur is a multi-linguistic city. People speak various languages including Marathi, Hindi, Telugu, Kannada, Sindhi, and Gujarati. The culture of people in Solapur is influenced by the two states predominantly, Kannada and Marathi. In the recent past, the city was affected by communal riots and raised serious questions on the inclusive way of living of the people[35].

The environment quality of the city is getting deteriorated. Studies conducted by the Municipal Corporation and Maharashtra Pollution Control Board (MPCB) show that there is an increase in the pollution due to lack of treatment of water[36], increase in traffic congestion, noise generated during festivals, etc. The Environment Sector Plan is proposed in the Development Plan of the city. The goals like making the major lakes in the city as places of recreation, increasing the green cover of the city, maintaining the Respirable Suspended Particulate Matter (RSPM) level within the prescribed standards. These goals can help in making the recreational facilities accessible and keeping the city compact.

Sustainable Compact City Policy in Nashik

In the city of Nashik, the zoning proposed in the Development Plan is effective to promote compact city development. It is also projected to have effective mass transportation system by promoting Transit-Oriented Development (TOD). In the plan, the industrial zones are extended by adding the adjacent land as per the consent of landowners in order to promote compact city development in the city.

One of the major objectives of the plan is to increase the density of population along the transport corridors. The plan aims in creating an integration of urban density and transport by means of TODin the city but the Development Plan resists the promotion of mix use development in the city. The Plan expresses concern about social welfare in the goal formulation stage but ultimately lacks in promotion of social inclusion in the plan preparation stage. It is important to note that the social infrastructure proposed in the city, can be a medium to promote social upliftment.

The city is rich in biodiversity due to the presence of four rivers namely Godavari, Darna, Nasardi, and Valdevi. One of the main objectives of the city Development Plan is to redevelop the core city areas which are important for the city. In order to protect the environment, green belt of 18 m for Godavari river and 15m for Nasardi, Valdevi and Darna river are provided along the banks. The green spaces are proposed to have recreation features like cycle tracks, tree plantation in order to maintain the environment of the area. The issue of social inclusion is unaddressed in the City Development Plan.

Sustainable Compact City Policy in Aurangabad

In the case of Aurangabad Development Plan optimising the land resource is one of the main objectives. The density of 230 pph is proposed. The Plan promotes the involvement of various NGO's to

promote environmental conservation in the city. Town Planning (TP) Schemes are proposed to maintain desired density in the city and a desirable quality of life.

The city is an important primate city in the Marathwada region of the Indian state of Maharashtra. It is observed that the city possesses a possibility to develop as a compact city due to following characteristics: a) Social Exclusion is observed and documented by various researchers in the case of Aurangabad[37]. The exclusion in terms of economic status and religious basis is expected to be a prime concern for city planners and policymakers. In the city, the areas dominated by one religion is resulting in a ghetto culture, facilitating the social exclusion in the city. Social inclusion is one of the prime determinants for the creation of a compact city. It is important for city planners to work and formulate in a way that social inclusion is promoted in the city of Aurangabad. b) High Density: Aurangabad is a comparatively high-density urban settlement, the reason behind this is the ghetto which is created in the city. The density is higher but that fails to assure the sustainability feature in the planning of the sustainable compact city. It is important for the city, to formulate a plan which can assure sustainability along with an adequate degree of city compaction. The ribbon development along the road transit routes in the city is a major threat for the promotion of sustainable compact city in the city of Aurangabad. c) Mix use: This is another feature of compact city planning but is absent in the Development Plan (DP) in the city of Aurangabad. The mix of use is proven to promote security in the neighbourhoods of the city. In the case of Aurangabad, the DP does not include mix use as a land use category, which is a challenge the city needs to take in order to create a sustainable compact city.

Indicators of Measuring Compact City

In this section, the indicators related to the measuring of the compact in the developing countries are discussed. In the case of developed countries like the United Kingdom, researchers used three types of indicators namely, density indicators, mix use indicators, intensification indicators. The density indicator was measured using variables of the density of population, the density of built form, the density of subcentres, and density of housing. The mix-of-use indicators were measured using variables of the provision of facilities, a horizontal mix of uses, and vertical mix of uses. The intensification indicator was measured using variables of increase in population, increase in development, increase in density of new development, and increase in density of subcentres[38].

In Indonesia, the compact city is measured by accounting the influence of Information and Communications Technology (ICT). In this approach, Yogyakarta city is considered as a case. The compact city attributes employed in this work are population densification, activity concentration, public transport intensification, city size and access consideration, and social economic welfare target. In the case of population densification attribute ICT related indicators like mobile internet users, and computer users in the city were considered. Activity concentration was measured using indicators like Information Technology (IT) related industry located in the city, and online shopping activities in the city were considered. Public transport intensification attribute was measured by using the indicator rate of a resident using internet-based transport service per total population and rate of residents using GPS or geo-location. The city size and access consideration were measured using the indicators like the number of telecommunication antenna in the area, and the number of hotspot or wi-fi in the city. The socio-economic target attribute was measured using the indicators like rate of elderly persons using gadgets per total population, and the rate of facilities which were served online or phone per total population[39].

In the case of Iraq, the researchers have used various indices to measure the compactness and sprawl relation in the case of Nasiriyah city. Development clustering is measured using Global Moran's coefficient, Centrality was measured using Gini and Lorenz co-efficient, proximity by using compactness index, diversity by Simpson Index and fishnet 1 km., and percentage of blocks to space using porosity index[40].

Researchers in India employed and developed a set of indicators to measure a compact city. Density, density distribution or dispersion, transportation network, accessibility, shape, and mix use land composition were some of the key urban form characteristics employed for measuring the compact city. The indicators used for density characteristics are gross population density, average (built-up area) density, land use spilled up, and average land consumption per person. Density profile, density gradient, and population by distance to the centre of gravity or CBD were employed for measuring density distribution. Mode share, average trip length, road network density, congestion index, and walkability index were used to understand the transportation network in the city. Accessibility was measured by using service accessibility and public transport accessibility. Dispersion index was used for understanding the shape of the city. Mixed use land composition was measured by land use split up, the ratio of residential to non-residential use, and the ratio of built to open area.

DISCUSSION AND CONCLUSION

In this work, we reviewed the cities in Maharashtra, namely Solapur, Nashik, and Aurangabad. It is observed that the development plans of these cities are approaching towards the planning of a sustainable compact city. The aspects like making green spaces, making social infrastructure available, creating economic units like industrial areas for employment can lead to social, economic and environmental sustainability. Increase in density and implementation of transit-oriented development strategies are used to make these cities compact. It is important to note and understand the social exclusion which exists in Indian cities, due to language, religion, culture and the caste system. The development plans fail to address social exclusion in the cities of Aurangabad, Nashik, and Solapur. Social inclusion is one of the important components of a compact city which is absent in the plans. It interesting to learn from the study that the accessibility is given lesser importance and availability of infrastructure is given more importance in the plan.

The latter part of the paper discussed the various approaches adopted in developed and developing countries to measure a compact city. It is observed that density and urban form related indicators are given more importance than the parameters related to mix use and social inclusion in the studies conducted. In the Indian context, the social inclusion and mix use which are major prospects of planning compact cities would have to be given more importance.

It could be concluded that the holistic consideration of compact city characteristics is required to make Indian cities compact and sustainable. In the cities under consideration, social inclusion should be given more importance along with accessibility rather than purely developing compact city concept with high-density development.

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BOOK REVIEW

Managing Urbanization, Climate Change and Disasters in South Asia (2020) by Ravindra Kumar Srivastava, Singapore, Springer, p. 469, Hardcover, Rs.14,041.00

Urbanization is the process through which cities grow. In this process large number of people migrate from rural areas and concentrate in relatively small areas, forming cities. It has been on a surge since industrialization in early 1800s. As per a UN estimate, 54 per cent of the people lived in urban areas in 2016. While this trend is considered good for growth, it introduces risks and hazards which are more severe than before. This haphazard urbanization continues to add heat trapping greenhouse gases to the atmosphere causing climate change. This gives rise to disasters. The effect of climate change can be seen across the world. Some parts of the globe are more ravaged by climate change than others, such as Southern Asia, South America and Australia. Thus, the issue of impact of urbanisation on the climate, deserves serious attention.

Against this backdrop, the author in this book has attempted to deal with the potential risks due to catastrophic events emerging in the urban landscapes of South Asia. He highlights major physiographical, topographical, demographic and geological indicators that are responsible for changing the pattern and trend of urbanization in South Asia. The book presents different aspects of disaster management in South Asia. It also presents effects and impacts of climate change in the region and various urban setups under climate change induced risks. Further, it addresses the issues of risk reduction and mitigation of governance at local level and suggests some noteworthy proposals at the end of the volume. The author of the book is a former civil servant of Indian Administrative Service and has dealt with complex areas of governance, disaster management, environmental and forest management, during his service. His insights are reflected in the book.

This book consists of eight chapters. The first chapter discusses the risk profiles in the context of urbanization in South Asia. The second chapter characterizes the risk types in South Asian Region (SAR) in a detailed manner, with the help of some interesting tables, pictorial representations (using bar graphs, pie charts and spatial maps, e.g. Flood Risk maps, Forest Cover change maps, etc.) Third chapter focuses on managing disasters in South Asia. Fourth, Fifth and Sixth chapters give detailed descriptions about the effects of climate change in South Asia and the neo-urban risks introduced due to it. Chapter Seven gives a detailed insight into the organizational framework of DRR (Disaster Risk Reduction), CCA (Climate Change Adaptation) and the municipalities.

It consists of detailed organograms and tables describing the functions of each of the departments in these local governments. Eighth chapter highlights the issues faced while managing these risks and proposes some strategy changes in the framework of the same, in terms of financial management and administrative accountability.

At the very beginning of the book, the author is being persuasive about the fact that we, human beings are continuously running after money/or some other forms of assets, without taking a moment to realize the consequences of our actions. To highlight the level of ignorance of common masses, he quotes Noam Chomsky: "The general population doesn't know what's happening and it doesn't even know that it doesn't know." The author also depicts his nostalgic feelings about his home town, Varanasi. As known to many, sturdy increase in urbanization gives rise to neo-urban risks and consequent disasters of worst order. Above all, non-coordination, mismanagement and confusion among different verticals of ministries pose much greater risk in disaster management. This pursues the author to come up with this book, a third initiative in writing for Disaster Management in India.

In the subsequent section, urbanization rates alongside demographic profiles for SAR countries are discussed. A number of varied problems arising out of increased urbanization are briefed, e.g. insufficient and inefficient sewerage, waste management, unmanageable growth of slums, incidents of acute poverty, depleting groundwater and degradation of urban ecosystems. The author has given a brief geographical profile, including the climate profile in SAR. He has explained how anthropogenic global warming has triggered the negative impacts of the disasters occurring in this region, explaining how urban areas at the coastlines are at stake. He emphasised as to why disaster management/preparedness is a pressing need nowadays especially for the SAR and how the book is relevant in this particular matter. Chapter seven starts with elaboration of SAR's Disaster Management Mechanism. It consists of methodologies such as DRR and CCA, as mentioned by the author. He has penned down the organisational setup, institutional arrangements, administrative framework of these mechanisms and the existing urban governance context in SAR countries, i.e. Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. He has explained how the municipalities work in these SAR countries, with respect to urban governance setup. He has also criticised the municipalities for their budget mismatch (mismatch between own revenue and expenditure). In his study, he has picked holes in the working of the higher order 'urban managers', who according to him are ignorant about developing an understanding for Climate Change

and the new risks associated with haphazard urbanization. The author, therefore, emphasising the need for developing a strategy for dealing in risk resilient urban infrastructure. At the end of the book, the author has suggested measures for integrating climate change and urban adaption with state's planning processes, and puts forward a Risk Alleviation Platform (RAP) to bring the risk managers working in different fields together and bridge the gap between these institutional frameworks of DRR, CCA and the working of municipalities.

However, the author could have added some real life incidents as case studies to support his claims about the existing status, negligence and non-coordination of municipalities, DRR and CCAs. The RAP concept given by him, to be introduced in local governance is a unique idea. However, its detailed working strategy could have been more useful. One of his proposals includes a balance to be achieved by introducing fiscal reforms in local governments.

The book is useful for students, researchers, teachers, urban planners and policy makers. It puts together several facts about urbanization, climate change and disasters in South Asia, in a comprehensive manner. Besides it puts forward the shortfalls in the administrative structures at the local level in SAR, which if improved, can reduce the degree of catastrophe. The book has been quite engaging, especially in its later parts, where it explains the urban governance at local level, in various countries. The author deserves kudos for taking up an ambitious task of presenting the details of disaster mitigation techniques in several countries. This book is recommended for institutions dealing with disaster management, climate change and urban governance.

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