



Research Paper

Pandemic Resilience Planning

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ABSTRACT

The spread of the COVID-19 pandemic throughout the world has shone a spotlight on the resilience of mankind and on the systems and infrastructure that we rely upon in cities for our physical, mental and economic wellbeing. The need indicates that policies to increase disaster resilience should also focus on achieving resilience in planning process including the anticipated impacts of health emergencies such as pandemics. The study aims at assessing the impact of pandemic on individual and community and suggests suitable recommendations for pandemic resilient planning. The study analyses government guidelines and policies for the management of pandemic like situations by understanding the nature and context of the COVID-19 Pandemic in Pune city. Analysis described in this study indicates that most people are best off during a disaster living in a walkable urban neighborhood with convenient access to common services and activities, and social connections that provide security and support. The study considers the short-term measures adopted by the government bodies to curb the effects of the pandemic and attempts to assess the impact of such measures on community. It looks through the recommendations for pandemic resilient planning for achieving preparedness of the community and infrastructure to sustain such future shocks and stresses. The study analyses that more than anything, the key to true resilience means putting the community at the core of planning, communicating, and governing.

KEYWORDS: Pandemic, COVID-19, resilience, resilient planning, healthy cities.

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I. INTRODUCTION

The global spread of the COVID-19 epidemic has highlighted humanity's resiliency, as well as the systems and infrastructure that we rely on in cities for our bodily, emotional, and economic well-being. As the awfulness of the pandemic has shown us, our capacity to stay strong – to beat stuns and focuses, to adapt to vulnerability and to be ready for whatever challenges the future brings – has been woefully tried. (Prahraj and Vaidya 2020)

Most cities across the world have invested significant time and effort improving their resilience to a variety of threats and vulnerabilities, including climate change, extreme weather events, and rising sea levels. However, until today, the potentially destructive effects of a pandemic have not played a significant part in collective thought about planning, designing, building, and operating urban spaces. As the globe grapples with the aftermath of the COVID-19 pandemic, numerous concerns arise about what it means to "build back better."

UN-Habitat focuses on four pillars in the COVID-19 response long term and short term. The study mainly addresses these pillars through an urban planning perspective.

- Rethinking the state, reorganising local governance mechanisms
- Addressing the increase of poverty and the exacerbation of inequalities in cities
- Rethinking urban morphology, creating new evidence on density and compactness
- Reducing the risk of failure of the current urban economic business model

II. NEED OF THE STUDY

Infectious diseases constitute a significant threat. They have the potential to kill millions of people and incur enormous economic costs. As shown to the right, increased hygiene, immunizations, healthcare, and other public health efforts have significantly lowered their mortality rates. Pandemics currently kill significantly fewer individuals and result in considerably fewer years of potential life lost than other health concerns like cardiovascular disease, cancers, and accidents. The COVID-19 pandemic, on the other hand, presented a number

of challenges, including the need to reduce contagion risks, especially for disadvantaged groups, provide basic access and delivery services during quarantines and lockdowns, support physical and mental health during lockdowns, and provide affordable mobility for low-income households.

According to the findings of this study, most people are better off during a crisis if they live in a walkable urban neighborhood with easy access to common amenities and can activities, and social connections that provide security and support. Policies to improve disaster resilience should also help achieve other community goals such as affordability, economic opportunity, and environmental protection, according to the need of the hour.

III. AIM AND OBJECTIVES

To assess the impact of pandemic on individual and community and suggest suitable recommendations for pandemic resilient planning.

Objectives-

The major objectives of the study are:

1. To understand the nature and extent of Pandemic.
2. To analyse the Present Policies and Guidelines for Pandemic control.
3. To analyzethe notifications and circulars issued by the government.
4. To assess the impact of the pandemic on Individual and community level.
5. To give recommendations for pandemic resilient planning.

IV. METHODOLOGY

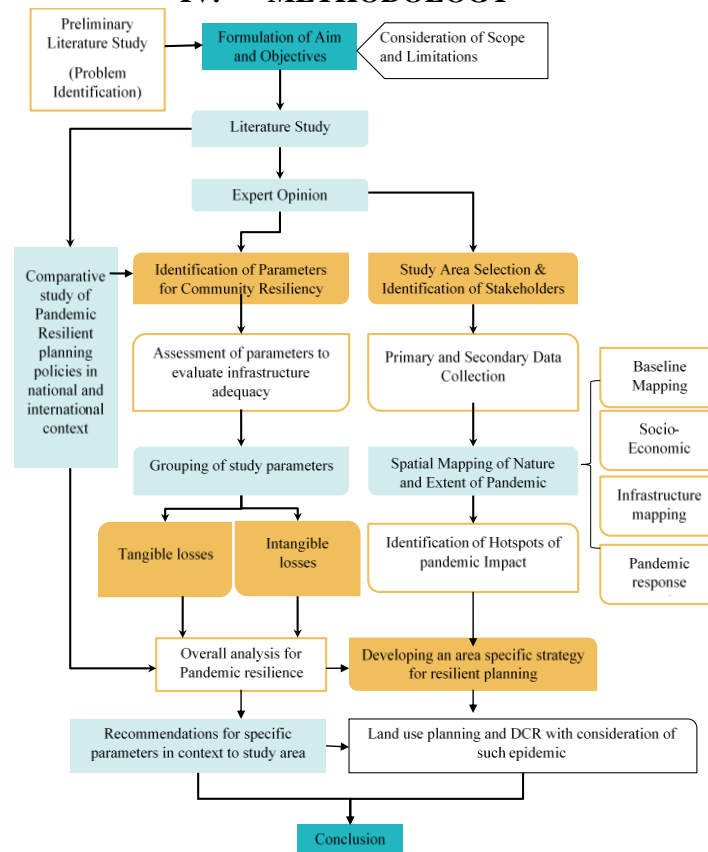


Figure 1 Methodology Framework

The figure above shows the methodological framework formulated to analyze the provisions for pandemic in various government policies and regulations, short term regulations imposed by the state and the local government and to collect data through primary and secondary sources to analyze and give suitable recommendations.

4.1 Study Area

Pune is the second largest city in Maharashtra, a western coastal state in India. With an estimated population of 6.6 million in 2020. Pune city has seen health crisis in past as well such as Swine Flu in 2010 and

then in 2019 as well. Pune is also a city under 100 resilient cities under Rockefeller foundation, which is an opportunity for the scope of the study.

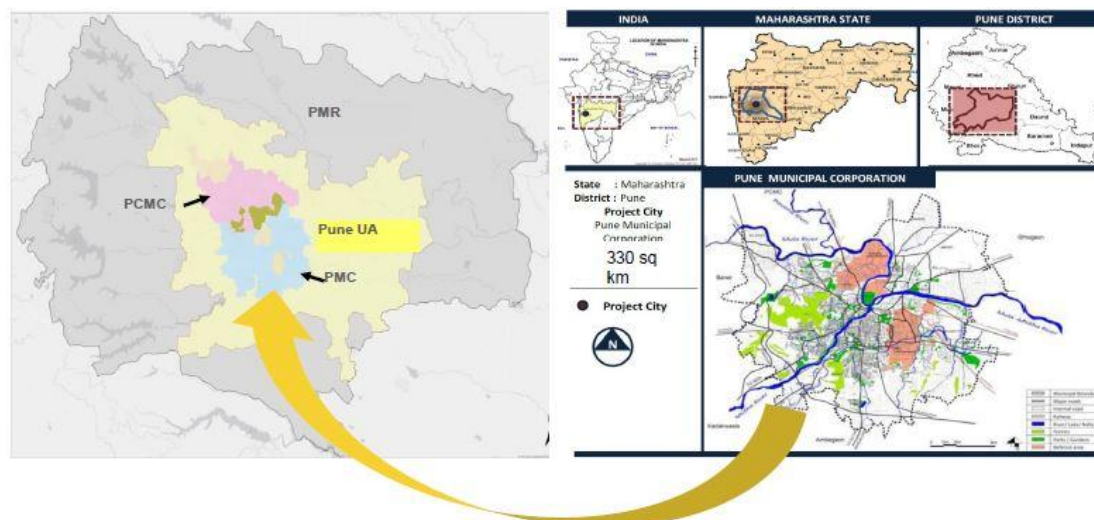


Figure 2 - Location of the study area

The first case of COVID-19 was detected in Pune on 9th March 2020. The city created a COVID-19 response team and a 106-bed isolation facility. Meetings were held with department heads, government hospitals and public representatives to devise a preparedness plan.

After the detection of the first case, it took 48 days for Pune to cross 1000 cases but only 11 more days to cross 20002. A decision was taken to identify and focus on hotspots within the city to control community spread. The city government identified five wards with the highest number of cases and created the Action Plan for Hotspot Areas to address the root causes of COVID-19 spread in these areas³. The highest density of cases was reported from informal slum settlements within these wards. It was understood that the lack of space within these settlements made it a challenge to implement proper social distancing within them, as was the case in places like Dharavi—Asia’s largest slum, located in Mumbai, the city with the most COVID-19 cases in India—which witnessed an early spread.

4.2 Questionnaire development for Primary survey

The structured questionnaire has been designed based on the identified variables listed in previous section. In order to arrive at realistic decision framework for pandemic resilient planning, the questionnaire has been designed to collect the data related to impacts of pandemic on people in various aspects of their lives. Sample size was distributed proportionally among all the areas around the study area. This has been done to reflect all the wards population and area characteristics in the analysis.

4.3 Expert Opinion Survey

The expert opinion Survey was carried out from 62 experts from different fields representing various levels of government employees. This survey majorly focused on understanding the changing priorities in planning process due to COVID-19 outbreak from the experts. This Survey also used Likert scale for understanding the level of agreement of experts with changing planning priorities.

Out of all experts, there were 64.5% of male respondents and 35.5% of female respondents. As seen the slide, around 47% of respondents belong to age group of 24-35 years and around 45% of people belong to 15-24 years.

4.4 Analysis Nature and Extent of Pandemic in the study area

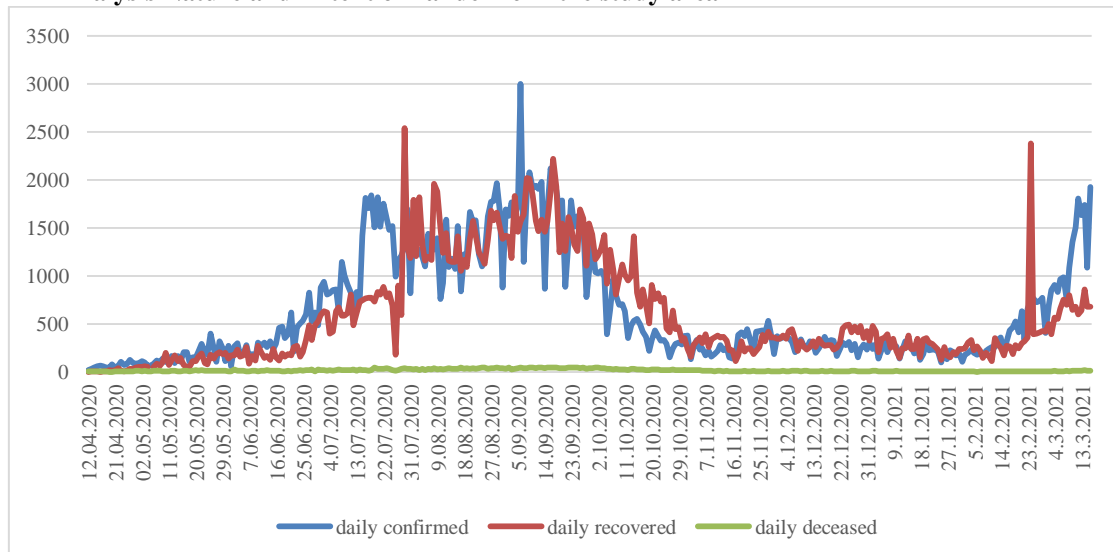


Figure 2 - Caseload statistics of COVID-19 Pandemic in Pune

The secondary data collected included the information about active cases of COVID 19 in are under jurisdiction of Pune Municipal Corporation. The graph shows trend of daily confirmed cases, daily recovered and daily deceased. The information collected clearly shows the rise in cases in July, August and September 2020 and then overall decline till February 2021.

4.5 Strategic focus areas for recommendations

Level 1 - Prevent

The population, economy, and environment will all play a role in a city's health resilience. Promoting and preserving accessible green areas, secure and attractive public transportation networks, decent air quality, and reliable basic services are all part of planning for healthy communities. Individually, healthy residents will be more resistant to disease, and a pandemic will spread more slowly across a city's population as a whole, allowing for more time to adjust and less strain on the healthcare system.

Level 2 - Protect

During a pandemic, such as COVID-19, individual protection methods include lockdowns at various levels (from homes to cities, regions, and countries), social separation, handwashing, and wearing face masks. This has implications for urban infrastructure such as transportation (how to transport as many people as possible while maintaining social distance?), pedestrian areas (how to route groups of people through narrow streets?), and water infrastructure (how to provide all people in informal settlements with access to water and soap for handwashing?).

Level 3 - Prepare and Adapt

A pandemic frequently necessitates the construction of additional or different healthcare facilities. This level focuses on modifying and expanding healthcare facilities such as hospitals, quarantine, and rehab centres. Non-medical building transformations, both permanent and temporary, require a focused management strategy. In the next paragraphs we discuss long-term recommendations for all urban planning issues relevant to pandemic resilience.

4.6 Regional level proposals

1. Medical facilities at hierarchical level – Tehsil, sub regional and regional Development of Primary Health Centers in 2 stages:

a) Short- term measure –

One primary health centre - for a 40,000 population. (2 doctors, 1 nurse, 4 PHN, four midwives, four trained dais, two SI, two HA, one pharmacist and 15 class IV employees.) Secondary health centre provide support, coordinate and supervise PHC. Each PHC not to serve more that 40000 population.

b) A long- term programme -

Primary health units with 75 bedded hospitals for each 10,000 to 20,000 population and secondary units with 650 bedded hospital, again regionalized around district hospitals with 2500 beds.

Community Health Centre (CHC)
 A 30 bedded Hospital/ Referral unit for 4 no. of PHCs with specialized Health Services

Primary Health Centre (PHC)
 A Referral unit for 4-6 Subcentres; 4-6 bedded manned with a Medical Officer in-charge and 14 subordinate paramedical staff no. of PHCs with specialized Health Services

Sub Centre (SC)
 Most peripheral contact point of community with Primary Health Care system; manned with one MPW(M) and MPW(F)

2. **Multipurpose ground** at hierarchical level – for using them for various purposes in pandemic such as Isolation camp, setting up of emergency medical facilities, Housing the migrant people, housing the houseless people
3. **Balanced regional development** - Employment issue, Migrant’s issue
4. **Housing for all and affordable housing** to avoid forceful eviction
5. **Slum improvement** on priority basis

	Urban Areas	Rural Areas
Special Risks	<ul style="list-style-type: none"> • Crowded buildings and sidewalks • Access to Elevators • Public transit • Homelessness and inadequate housing 	<ul style="list-style-type: none"> • Vulnerable (old, poor, chronic illness, etc.) populations • Limited public health resources • Physical and social isolation • Poor access to medical facilities • Inadequate housing • Poverty and limited employment options
Preliminary Solutions	<ul style="list-style-type: none"> • Targeted cleaning • Promote hygiene rules • Promote social distancing • Improve walking and bicycling • Eliminate homelessness and improve housing quality 	<ul style="list-style-type: none"> • Improve public health services • Targeted outreach to isolated households • Improve access to essential services • High speed internet access and e-services • Financial assistance to poor and unemployed • Improve housing quality

4.7 Governance

4.7.1 Recommendation for central government

1. There is a need to amend the constitution to bring urban development into the concurrent list. So, the substantial regular budget allocation can be made to state and cities. List service of 100 smart cities is effective, but it will be not adequate for a country of around 7000 cities and town.
2. Prepare national urbanization policy and provide guidelines for the state.
3. The minimum standards for a house should be increase from 29.0 sq.m. to 50.0 sq.m. to avoid congestion and extreme density in the built form.
4. Promote central housing for the urban poor in the big way. Bring legislation and work through involvement of employees as well.

4.7.2 Recommendation for state government

1. Prepare a state urbanization policy to create a proper settlement hierarchy and avoid creating mega cities.

2. To amend Maharashtra Regional and Town Planning Act 1966 to provide for larger deduction of land up to 60% in a Town Planning Scheme, in order to provide for public space, roads and amenities that reflects in URDPFI guidelines also to amend section 14, 22 of the said acts.
3. To amend UDCPR to provide 20% of land as common open space instead of current 10%. Relax FSI norms for terrace and balcony areas, and upper-level open spaces such as in apartment and commercial complex.
4. Provide guidelines and regulations to promote Urban development strategy. This should be not only the regulation at plot level but should address an area level approach.
5. Promote delineation of metropolitan region for the large urban area and prepare integrating rural with urban to create better living environment for the people.
6. Allocation of 6-8 %of urban land to accommodate housing for the poor. This land should allow low-cost affordable incremental housing for urban poor.

4.7.3 Neighborhood level Proposals

Indicator	Proposal / Recommendation
Physical Distancing between users in public spaces	<ul style="list-style-type: none"> • Wider width of pedestrian paths • Increased no. of One way Paths • Dedicate road section for cycle routes • Dimensions of parking area to be adjusted based on predictable no. of users and including movement space
Flexibility and Equitability of spaces to be used for Temporary activities	<ul style="list-style-type: none"> • Decentralization of food courts and Markets • Number and size of balconies, terraces and flat roofs recovered for use • Equitable spaces in each society for quarantine facilities
Exposure of users to air and sunlight to increase immune defense	<ul style="list-style-type: none"> • More number and dimension of Green spaces • Distancing measures followed in local facilities

4.7.4 Recommendation for cities and towns

1. Delineate the urban area boundary to accommodate rural urban integrations.
2. Promote urban agriculture, urban forestry and landscape terraces in built forms.
3. Substantially add large city level parks, maidans and regional parks in master plan.
4. Promote medium density development and expand the city to facilitate adequate provision of open spaces and amenities.
5. Prepare zonal plan to ensure large urban open spaces and proper road network with integration of public transport system before preparing detailed town planning scheme.
6. Design of street to provide substantial space for pedestrians, green spaces, plantations and street furniture.
7. Promote pedestrian streets and bicycle network with climate protection.
8. Create pedestrian and public transport friendly commercial areas and Central Business District.
9. Prepare proper urban design guidelines to create better public spaces and also suitably accommodate informal activities.

V. CONCLUSION AND FUTURE SCOPE

A city's resilience is dependent on its residents just as much as it is on its infrastructure, institutions, or governing structures. We saw the need for our communities to become more robust to future pandemic outbreaks during the epidemic, as well as the inventiveness and adaptation of many communities around the world. This study has aimed to understand healthy pandemic resilient cities and provide recommendations for the mid and long term.

The case studies show how to avoid and regulate viral transmission, which can help to reduce infection and save lives. The critical role of societal resilience in the recovery from COVID-19 is a call to action to put community resilience at the heart of urban resilience. It is critical to strengthen collaborative ties with all stakeholders in the community when it comes to urban planning and development. Cities are only as resilient as their weakest residents. As a result, all vulnerable groups should be included in the broader development agenda. Increasing the number of people who are registered and documented, such as migratory workers and refugees, is a crucial step toward inclusion.

Citizens' general health can be improved by urban design, which helps a city's health resilience. The endeavour to meet fundamental requirements must be maintained, strengthened, and prioritised. One of the primary concerns for existing informal settlements and disaster relief centres is the provision of adequate water, sanitation, and hygiene (WASH) materials (toilets, soap and hand sanitizer, showers, cleanwater, etc.). Solid waste management, food distribution, and electricity supply are among key challenges that affect health in informal settlements. Green spaces, high air quality, a safe transportation system, and infrastructure that supports several modes of mobility all improve physical and mental health. Finally, architecture can improve

ventilation in buildings and neighbourhoods, which is an important role in avoiding and reducing disease spread.

A pandemic must be included in Disaster Management Plans in order to plan for robust and adaptable interventions for pandemic resilience, including additional healthcare facilities such as hospitals, quarantine, and recovery shelters for the vulnerable population with the goal of providing access to nutrition and hygiene. During pandemic lockdowns, the plans and programmes should also focus on the economic support system, particularly for people who cannot work remotely or are reliant on daily wage earnings, and offer safe mobility for necessary services. Cities that use smart technology can learn and adjust more quickly, increasing pandemic resiliency. Digitalization expands the instruments available to capture the value of data and improves a city's ability to plan for pandemic resilience and respond effectively in the event of a pandemic. Identifying transmission hot regions, healthcare availability, and managing contact tracing using GIS mapping tools and big data. Tracking the movements of (vulnerable) groups in the community can help predict the spread of disease and alter infrastructure use to reduce transportation costs. Above all, true resilience requires putting the community at the centre of planning, communication, and governance.

Except for financial and administrative concerns, the study looked into other significant factors of pandemic resilience. Incorporating these factors will result in a complete and more comprehensive scenario for pandemic preparedness planning, as well as more effective suggestions.

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