

Sustainable Infrastructure Facilities and Regional Transformations: An Urban Resilience Tool

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1. Abstract

“Nothing can survive in isolation and urban resilience opportunity exists in regional sustainability and sustainable infrastructure facilities.” Planning is must to transform the region to the climate change and it is high time to move ahead for sustainable Infrastructure. The issues that are coming up because of climate change like drought, glacier shrunk, temperature rise, global warming, etc. Sustainability is need of the hour. Infrastructure being the chord along which the development happen in cities. The paper is based on literature review of various aspects that relate urban resilience in context of sustainable infrastructure facilities and regional transformations and its importance. Hence, the plausible recommendations are identified to achieve the same.

Keywords : Sustainability, Infrastructure facilities, Regional transformation, Planning.

2. Introduction

Cities with rapid expansion of urban population due to unbridled migration and urban region's responses to climate changes can be viewed as hubs of intensive resource demand, environmental degradation and greenhouse gas emissions [1]. With rapid pace of urbanism and industrial development in the towns, progressive mechanization of the farm, disintegration of the joint family system, and an increasing demand for men and material in commercial enterprises and public utility services, the migration of rural population in to urban areas, in search of food and shelter, is expected to continue unabated [2]. Looking at Urban population, number of cities and percentage of urban population growth, anyone will be able to analyze that in next two decades almost half the world will live in urban areas - from small towns to huge megacities [3].

Transformation of a rural or sub urban area in urban occurs if the full or partial dependence of a settlement on land and agriculture is altered and the economies of these areas are made dependent on trade, commerce and industry. During transformation, the amenities and facilities of life, the way of livelihood and the culture of these areas are changed to the one that prevails in urban areas. The transformation in the output composition of employment sector in developing countries is creating pressure on urban infrastructure facilities through migration [4]. Transformations can be easily reflected by social factors, architectural styles and quality of spaces, economic, land-use changes and cultural aspects along with various problems associated with urbanism. The transformation of village in urban settlement is a comprehensive and gradual changing social, economic, architectural and cultural process. Various urban problems also follow gradual rise adding to

discomfort due to change in climatic conditions. The labour intensive industries and other low-level social services earnings don't enable the economic poor section competent of getting housed. The flourish of slums in form of shrink architectural spaces in city and abutting areas meets the demand for cheaper houses and add burden on existing infrastructure facilities.

Architectural space requirements shrink and slums overcome the existing urban villages and suburb rural settlements. Most of the urban water supply infrastructure always fails during summers; water logging problems during monsoon is common in all cities. Electricity shortages in searing hot season; roaring rentals at urban centres are also universal. Artificial air conditioned spaces in day and urban heat island during nights is a familiar phenomenon in every urban centre globally in regions of hot and dry, hot and humid and composite climates. Urban infrastructure, may it be water, power, transportation, and sanitation and storm water management, fails in most sought-after point in time shows lack of planning leading to unsustainable living. In the highly industrialized economies, sustainability as a notion emerged in response to the environmental dilapidation and overconsumption of resources [5]. With the climate changes and increasing pressure on urban infrastructure facilities at an alarming rate we have to find some solution for urban problems.

Resilience capacity is directly dependent on infrastructure facilities. Improving the efficiency of the existing infrastructure facilities and developing new infrastructure both offer a tremendous opportunity to build sustainable and resilient cities using less energy and water. Choices in housing, energy and public transport could reap massive local and global benefits over decades: the right choices will save water, energy and carbon, and improve health and quality of life [6]. Generation of new hybrid rural urban centres will act as a resilience tool for existing urban settlements.

The urbanisation process creates pressure on existing urban infrastructure facilities and rural land [7]. There are negative social, economic, land use, architecture and cultural changes that took place due to unplanned transformations which could have been avoided. The urban resilience solutions to already existing problems and climate posed urban challenges can be searched in sustainable transformations by targeting the root of the problem.

The problems of rural urban fringe and urban villages cannot be resolved within the existing administrative framework. The fringe under these bodies is treated as the city's dumping ground. The interests of these zones are not likely to be served by the city based planning bodies. "A fresh look at the administrative framework for the city and city region planning in is necessary [8]."

The sustainable transformations will lead to smaller cities with sustainable infrastructure facilities which will optimise the urban resilience process.

3. Aim of the study

The aim is to analyse role of Infrastructure Facilities and rural to urban transformations and suggest methods and policies to achieve sustainability in infrastructure provision and the transformation process.

4. Objectives of the study

To analyse the nexus of sustainable transformations and urban resilience;

To analyse role of sustainable infrastructure facilities in strengthening urban resilience;

To suggest policies and implementation methods with reference to sustainable infrastructure services and transformations to achieve urban resilience preparedness for different shocks and stresses of climate change.

5. Methodology

Table 1

Problem identification – Rural Urban Transformation		
Literature Review	Study about different types of transformation in settlements and policies adopted across world. Study of integration of sustainable policies in infrastructure facilities for existing urban fabric.	Analysis of the literature study
Suggestions	Suggestions of policies and methods to be adopted in context to the city referencing infrastructure facilities and sustainable transformations. Trend projection for sustainable transformation and sustainable infrastructure incorporation in any existing city. Future scope of study will be defined.	Plausible recommendations

6. Literature Study

Moerbeek [9] has explained the evolution of cities and the formation stage of various settlements from historical context with emergence of various problems throughout the evolution process. Cities must become resilient to a wider range of shocks and stresses of climate change and must promote urban development and sustainability to foster climate change resilience [10]. Traditional definitions of urban and rural transformations fail to capture the complexity of the land uses changes and their connection. Economic and social conditions in slums and peri-urban areas can be improved through targeted intervention aimed at the linkages and interactions of infrastructure facilities within regions for the development of urban resilience. For that to happen, however, it is important for planners and policy makers to develop strategies based on the realities contextual to various spaces [11]. Various researchers have done identification of the variables for rural to urban transformations [12], and proposed that government must step up the economic development at

least to be able to make the rate of urbanization sustainable [13]. The focus of most of the urban resilience strategies focus on mitigation rather than adaptation [14]. Godschalk [15] has pointed out that current hazard mitigation policy, practice, and knowledge fail to deal with the unique aspects of cities under stress and proposed expanded urban systems research, education and training, and increased collaboration among professional groups involved in city building and hazard mitigation as resilience strategies.

7. Discussion

The framework of urban resilience is the action of multiple disciplines of the stakeholders. There is a necessity to bridge the gap between the rural and urban infrastructure that helps us to control the migration. Community participation and collaborative planning which emphasizes the integration of regional transformation on the path of development is the need for sustainability and resilience. Urbanization and environment are directly linked with society and together develop the need for infrastructure based on socio-economic characteristics of the region.

The impact of the actions of actors are the actions and outcomes of the socio-economic interface they carry. The social problems and require help in framing the characteristics of the nature of the project and the growth of the region. The optimized use of the non-renewable resources with the fusion of actions of actors makes the need to infrastructure more towards sustainability which heads the direction of resilience. Governance that includes the implementation, monitoring and legal framework too needs to work with collaboration adaptation of the transformations with time. Vulnerability is another milestone for the same context and needs to be prolonged in policies with great concern and requirements of infrastructure indulge the key aspects to meet the desires. The adaptation of the people-centered approach is more rewarding in all the above-mentioned aspects to drive towards the aim.

8. Conclusion

The study concludes with the identification of the need for sustainable infrastructure and regional transformations for urban resilience. The authors identify the importance of role and actors and recommend the collaborative and community planning to achieve the future bright pursuit of the growth in the time ahead. The resource utilization is suggested to be optimum. The development is stated to be concerning socio-economic profile and hence, the choice of development of infrastructure having a hand with technology and technique to achieve sustainability shall be endured with the regional transformation with the participatory approach and uniting the actors leading to resilience.

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