

Dynamics of Peri Urban areas of Indian Cities

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Abstract: With the increasing urbanization, cities are continuously sprawling outward with expanding urban boundaries. This over spill of population is accommodated within the peri-urban interface of cities. Peri-urban is characterized as having a transformative nature, attributed to a lot of physical, social and environmental changes occurring in those areas and also the fact that what is peri urban today would be urban tomorrow which makes it significant when it comes to spatial planning. This paper helps in understanding the definitions of peri urban areas, its relevance to planning, explaining why it is important to understand peri urban areas, what are the various changes that it undergoes, jurisdiction and governance. Apart from various features which define and characterize peri urbanization, this paper also sheds light on how peri urban areas have been demarcated in Indian cities and what approaches have been adopted for the same. The various issues and challenges of peri urban areas have also been discussed in the paper following various concern areas of the peri urban interface.

Keyword: Peri urbanization, sprawl, dynamism, fringe, transformation, indicators, ecological sensitivity

I. INTRODUCTION

The urban population increased at a higher rate than the rural population first time in 2008. The estimation for 2050 suggests that two-third of the population of the world would be settled in cities or urban settlements. The UN estimates that most of this growth would occur in the developing and under developed countries in the world. To facilitate the accommodation of these increased populations, cities are expanding. This overspill of cities to their fringe areas and subsequently to the rural areas leads to what is known as peri urbanization. The phenomenon of peri-urbanization refers to a process which is dynamic in nature wherein the rural areas in the hinterland of the urban settlement, gradually become more urban (Douglas Webster, 2009).

II. PERI URBAN

The terminology of the Peri- Urban has originated from the word 'peripheral' (Janakarajan, 2010). Peri urban areas are a transitional phase in an area during which it is between rural and urban, i.e. it possesses the features of both rural and urban character. Peri-urban area is perceived to be larger than a fringe or boundary separating the urban settlement from the non-urban settlement but a transitional zone which is a zone multi-functional attribute (Joe Ravetz, 2013). They are, in many cases identified, by a continuous

exchange of people, production, finance, workforce and other utilities moving outwards from the urban area and travelling inwards into the city. Peri urbanization is often confused with urban sprawl: Urban Sprawl is a phenomenon and peri urbanization is the manifestation of it, it is the result of sprawl that rural areas get converted into urban areas. The peri urban pertains a nature inheriting dynamism and transformation, which is attributed to the progress of a rural area to a developed urban area, meaning that peri urban of the present, is bound to transform or manifest in the urban of future.

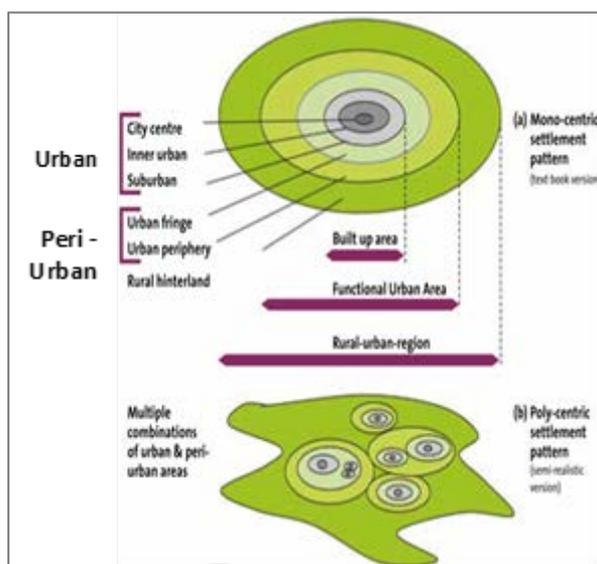


Figure 1 An emerging trend of peri urban sprawl

*Source: Publisher University of Copenhagen / Academic Books Life Sciences, Editor: Annette Piorr, Joe Ravetz, Ivan Tosics
ISBN: 978- 87-7903-534-8*

Within the same context following focus areas are identified for this paper: Delineation of the boundaries of peri urban areas, how to identify from where and till where an area becomes the zone of transition and on what basis should the definitions be selected, influence of the city: since there is a strong link between urban and rural, it becomes important to study these relationships and their impacts, Issues of peri urban areas: fringe areas face challenges which should be addressed after careful examination.

The expansion of cities creates many push and pull factors encouraging people to migrate from rural to urban and the hinterland. Since this area falls right in the middle of two very distinctive character spaces (urban and rural), peri urban, by the virtue of its dual character, faces the challenges of its adjacent urban areas and rural areas. However, the same character of not being either completely urban or rural, often leads to peri urban areas being overlooked.

It is evident through various case studies that there exists a strong interrelationship between the urban and what is known as the peri-urban, due to their close proximity. These links are as follow:

- a) Urban areas are at a constant pressure for space for various urban activities, with a even more evident scarcity of resources including that of land. This space is provided in the peri urban area, creating a link of resource scarcity in one and availability in the other.

- b) The urban area in return is a zone of opportunity and facilities, which becomes an attraction center for the residents of the transitional areas and the rural areas.

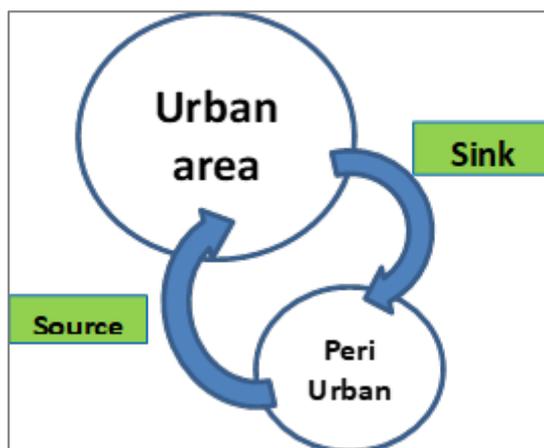


Figure 2 Urban to Peri-Urban Links
Source: Author

III. DRIVERS OF PERI URBANIZATION

To develop an understanding of the character of transitional interface, it is pertinent to first study various causes of the development in the peripheries, i.e the factors which trigger the growth. Multiple correlated and interdepend factors contribute to the development of these areas:

- Physical expansion of the city limits (urban sprawl):* the physical expansion of city to provide for the increasing population leads to the development in periphery.
- Migration of people from rural to urban:* Migration is another driver which contributes to the development. Farmers often migrate from rural settlements to urban areas in search of better job opportunities, however due to increasing living costs in the city, they have no choice but to settle in the less expensive fringe areas.
- Establishment of new economic activities:* Establishing a new industry creates job opportunities in the region attracting people from rural areas.
- Development of city services in the outskirts:* Planning of activities which are generally not provided inside the city, like airports, educational institutions, it hubs etc also become the trigger factors in the growth of the periphery.

Table 1 Drivers of peri urbanization in Indian Cities

<i>Growth</i>	<i>Chennai</i>	<i>Ahmedabad</i>	<i>Chandigarh</i>	<i>Patna</i>	<i>Guwahati</i>
Direction	Southward expansion.	Along transport routes	expansion towards Mohali, Panchkula	Growth and reorganization of internal space	More pronounced on the southern side

Drivers of growth	Growing as an IT corridor engulfing several fishing and agricultural villages and hamlets	Construction along transport routes lucrative for real estate developers. New industrialization along the roads.	Development of information technology park and the Himalayan express-way.	People of the rural poor, migrating to the area and the slum dwellers being resettled from the city.	Construction of institutions, apartments, industries
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Source: Author

In Indian cities, all these drivers can be seen in action, Chennai for instance is having peri urban growth in the southward direction of the city due to the development of a IT corridor, engulfing several fishing and agricultural villages. Ahmedabad, peri urban interface is witnessing growth around the transportation corridors. Construction along transport routes is very lucrative for real estate developers, also new industrialization along the peri urban roads along with several residential complexes coming up leading to the peri urban growth in Ahmedabad. While Chennai and Ahmedabad have experienced peri urban growths due development of IT corridors and real estate boom, Patna on the other had witness's growth in peri urban areas due to migration of people. Guwahati also has peri urban development due to constructions of institutions, apartments and industries in the fringe areas. Chandigarh, much like Chennai has development due to the IT Park and also due to the construction of the Himalayan express-way (Vishal Narain, 2004).



Figure 3 Causes of Peri Urban Growth

Source: Author

IV. TRANSFORMATIONS

The areas in context are characterized by their transformative character. Various parameters are identified in this paper to establish the changes that occur and thereby define the peri urban boundary.

- a) Changes in the demography
- b) Changes in socio economic parameters
- c) Changes in the physical and infrastructural aspects
- d) Changes in the environmental conditions.

These are the prominent changes that are seen in Indian cities. Though various attempts have been made in establishing a range for various indicators, through the literature review and case studies, it is found that the indicator range or limit is purely contextual based depending on the urban area to which the peri urban has to be identified. Following are the transformations in the peri urban areas in the socio-economic sector, physical sector and the environmental sector respectively.

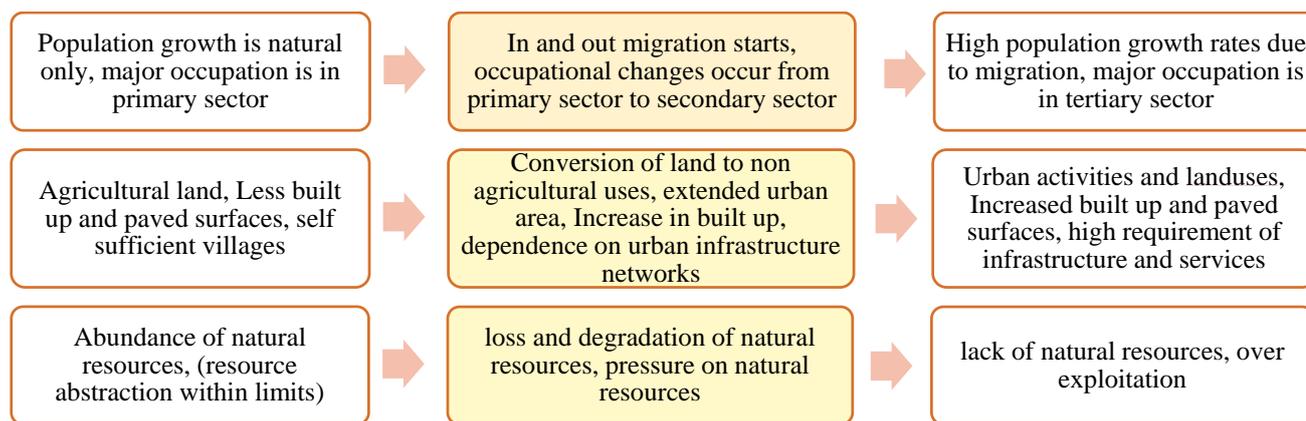


Figure 4 Stages of Transformation

Source: Author

According to (Shaw, 2005), peri urban areas undergo a change in land use, change is occupational patterns and change in the demand for infrastructure. The most obvious and perhaps the first change which is observed in most Indian cities is that of the land cover change. Given below are the land cover changes in the case study cities for two decades. It is observed that built up in all the cities has increased significantly and water bodies, vegetation or forest land and agriculture land has decreased in almost all case study cities.

Table 2 Landuse changes in Indian Cities for two decades

Landuse	Chennai	Ahmadabad	Patna	Guwahati	Chandigarh
Builtup	41%	+173%	+97%	+40%	+14.5%
Water bodies	-13%	+167%	-51%	-	+0.37%
Fallow land	-0.5%	-50%	-77%	-	+25.84%
Vegetation/forest	-15%	-32%	-64%	-10%	+0.03%
Agriculture	-3%	-86%	-40%	-10%	-24.5%

Source: Compiled by author

V. GOVERNANCE OF PERI-URBAN AREAS

The growth and development in the Peri-urban area is subjected to multiple institutions and organizations including the Nagar Panchayats, Panchayats, Town & Country planning department of state government District administration, MPC's, DPC's, Development authorities as per the 73rd amendment of the constitution.

The panchayats, are the local self-governing body which is responsible for the development decisions of the rural settlements. In the peri urban, however there is an amalgamation of the rural and the urban contexts, where the panchayat falls short while dealing with the urban character. This can be attributed to the lack of financial resources and the autonomy in the mobilization of the same, capacity to manage the dynamics of the area, and the expertise to guide the land use transformation and urbanization issues. The roles and responsibilities of various authorities and local bodies are not clear and distinguished which creates an ambiguity in the functioning of the area. Also due to no clear differentiation of roles,

there are many overlaps which further increases the mis management and lack of coordination in these areas. The lack of efficient governance in these areas is due to the negligence of authorities towards peri urban interface. This is also the reason why there is often a reluctance in accepting peri urban areas as an urban entity or zone in its totality. (Sharma, 2015).

VI. LINKAGES OF CHANGES AND IMPACTS

The peri urban areas, which are identified by changes, undergo many impacts due to the very nature of change. Various changes such as land use change, demographic and socio-economic changes lead to multiple impacts which trigger more changes.

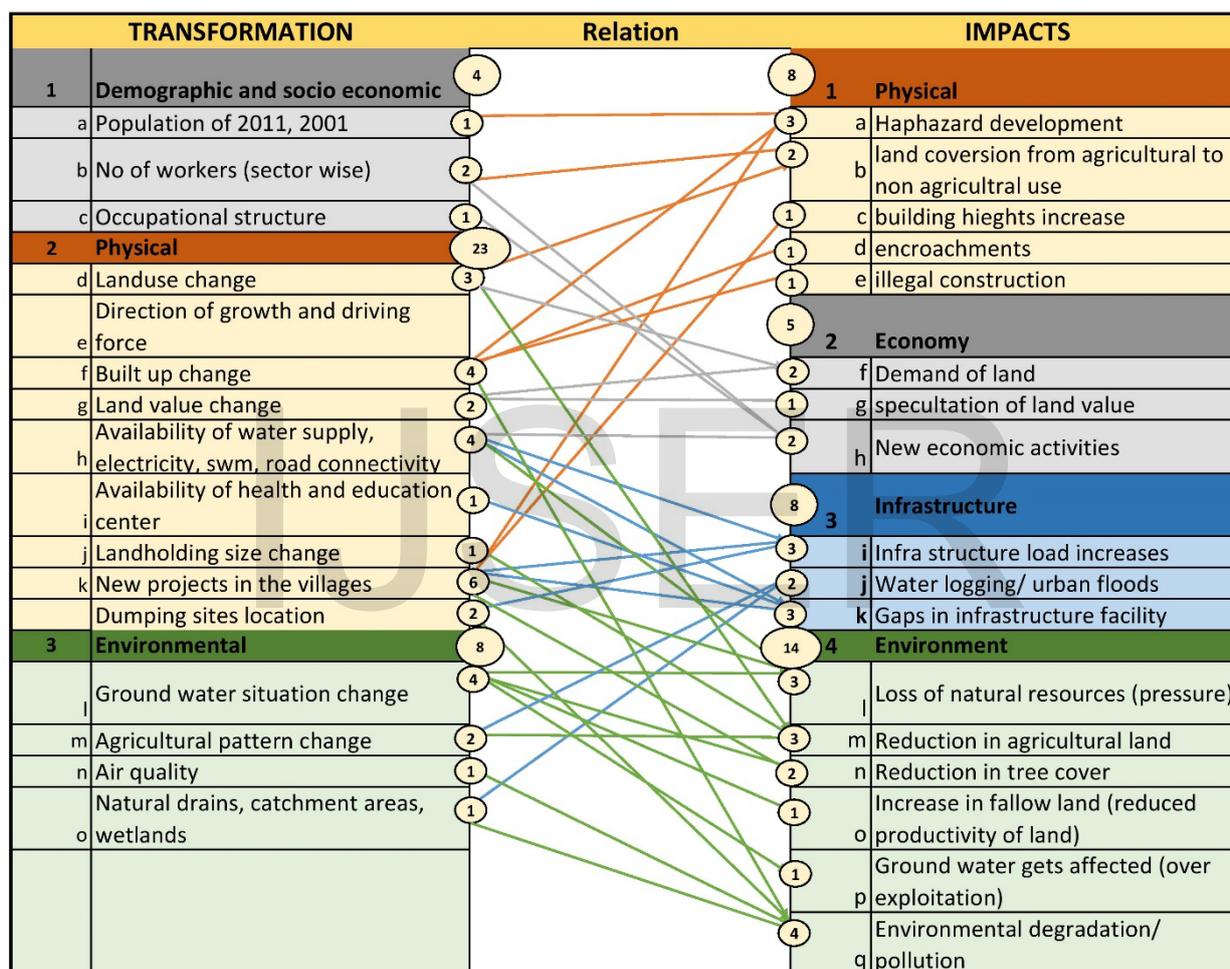


Figure 5 Relation between transformation and impacts in peri urban areas

Source: Author

The above figure is an attempt to establish the relationship between the various changes or transformations that occur in the peri urban part of a city and the various impacts that these changes might have. Demographic and socio-economic transformations have in total four impacts, physical changes such as land use change, built up change, infrastructure changes etc. have a total of 23 impacts, and environmental changes have 8 impacts. It is evident that the transformations in the physical and infrastructural parameters are the most critical while considering what changes are the most critical in peri urban areas.

Studying the impacts of these changes, the above figure suggests that there are 8 impacts in the physical aspect, 5 impacts on the economy, 8 in the infrastructure sector and a total of 14 impacts in the environmental sector. Thus, it is clear that environmental conditions are the most critical while trying to analyze the impacts of the transformations of various aspects in a peri urban area.

VII. ISSUES AND CHALLENGES OF PERI URBAN AREAS

The peri urban growth depends largely in its interrelationship with the urban on one side and rural on the other side. However, this interrelationship, if not comprehended and perceived, can lead to failure of adequate planning measures of these areas. The complexity of these settlements with an inherent duality to them, makes them areas of special critical challenges which are not observed in the adjacent rural or urban settlements.

Peri urban areas of Chennai face a challenge of solid waste mismanagement, there are open drains in the area. A fall in water tables and salinity intrusion has been observed in the region. Urban flooding has increased due to encroachment on the wetlands in peri urban areas.

In Ahmedabad wasteland areas are temporarily resided by the people. There is a constant competition for water resources in the periphery. Also observed are environmental challenges such as air and ground water pollution due to industries in peri urban areas affecting the agriculture of the region.

In Patna, it is seen that the waste of the city is dumped in the low-lying areas in the periphery. There is no provision of sewerage treatment in the peri urban areas leading to an issue of pollution of the ground water.

Guwahati, has a different type of natural setting and thus faces different types of issues such as: ecologically sensitive areas such as the cropped lands and water bodies have been encroached upon by high rise apartment buildings. Thus, the decreasing area of the wetlands, forests and cultivable areas is a major concern along with the displacement of the tribal populations residing in the same as one of the challenges along with the impact of the diminishing flora and the fauna of the region. The increasing construction on these lands have also affected the local economy of the villagers in the periphery. Also observed are more urban floods in the city, due to decrease in the wetlands. The increasing population have also caused over exploitation of the grown water in the region.

Chandigarh, although is a developed city, has a distinct peri urban growth, with similar issues such as: Loss in agricultural land, vegetation cover which has reduced by 50% affecting the ecosystem. Increasing deforestation has increased the sediment load of the lake significantly.

Peri urban areas of Kolkata faces similar issues such as: loss of 53% of its peri-urban wetlands. Heavy siltation in peri-urban wetlands and land-use changes has decreased the flood-resilience efficacy of the wetlands by 65% Abstraction of groundwater: high in the periphery Dumping of heavy industrial wastage on the surface water bodies has degraded some significant water sources. Contamination of the aquifer is a common problem in the region. Increase in the number of shallow tube wells has caused high abstraction and rapid seasonal drawdown of water levels

Table 3 summarises the issues and challenges observed in various case studies in Indian cities.

Table 3 Issues and challenges of peri urban areas

Aspect	<ul style="list-style-type: none"> • Issue based on case studies
Definition	<ul style="list-style-type: none"> • The peri-urban can only be examined by understanding the development process in the city and the rural areas. • There is no single definition or distinction between the activities of the peri urban • Different approaches for different cities to define their peri urban areas
Physical	<ul style="list-style-type: none"> • Haphazard Development • Variations in development • Loss of open spaces • Development on sensitive areas like flood plains, wetlands • Land use conversion to non-agricultural uses. • Poor accessibility, Absence of a rationalized traffic & transportation network • Irrational/ non- conforming land use pattern
Environment	<ul style="list-style-type: none"> • Peri urban environmental challenges are not confined in the same limits. • Lack of environment sensitive planning of the areas • Fall in ground water table • Urban flooding due to development on wetlands • Increase in the environmental pollution due to increasing industrial development in these areas • Lack of waste management leading to adverse impacts of health of people and the ecosystems.
Governance	<ul style="list-style-type: none"> • Policy formulation specific to the extent and direction of sprawl of the city are not there in cities. • Proper Planning framework and institutional approach is also needed for these areas. • There is a gap between plans and their implementation • Multiplicity of the authorities and the boundaries with no clear responsibilities
Infrastructure	<ul style="list-style-type: none"> • Inadequate Provision of Infrastructure • Variation in pricing of the resources • Competition with the urban areas for the same resource • lack solid waste management • Open drains or no drains at all.

Source: Author

VIII. CONCLUSION

From the paper it is evident that both the core city and the urban center witness growth at high rates. Since the land prices in the peripheries are very low, peri urban areas attract real estate; development becomes lucrative on these areas, contributing to the growth of the peri urban areas. Also development of transport networks, it hubs, industries and real estate projects become the drivers of growth, which

lead to enhancing the dynamic nature of the peri urban growth. These transforming areas present both opportunities and challenges, which are of significance in order to plan for these critical areas.

Table 4 SWOC of peri urban areas

STRENGTHS (+)		
High growth potential for urban and industrial development	Existence of large number of godowns & wholesale markets	Easier availability of large quantum of land at cheaper rates
Existence of growth triggers- large industrial/institutional units, major road/rail network	Better options for cheaper, spacious and affordable housing.	Comparatively low cost of living. Absence of any toll, taxes, levies, fees etc.
WEAKNESSES (-)		
absence of a well-defined legal framework for planning, development & management.	Large scale conversion of agricultural land into non-agricultural uses due to easy procedures/absence of any legal framework.	non- conforming land use pattern, Dispersed pattern of development with absence of basic infrastructure and services
Unauthorized and haphazard sub-division of agricultural land into small parcels	High degree of land speculation due to comparatively lower land values and simple procedures of land conversion.	High degree of environmental pollution/ Degraded Environment
OPPORTUNITIES (+)		
Creating large affordable housing stock in close vicinity to the mother city	Creating large opportunities for employment and economic activities	Creating a pattern of development which is affordable and economical
Minimizing growth of slums in the mother city	Creating balance between rural and urban development	Integrating effectively development and service network of urban and Peri-Urban areas
CHALLENGES (-)		
Continued large scale conversion of agricultural land into non-agricultural uses	High degree of environmental pollution/ Degraded Environment	Poor accessibility, Absence of a rationalized traffic & transportation network
Existence of slums/ low quality housing	Absence of basic infrastructure and services	Continued Irrational/ non- conforming land use pattern

Source: Author

Thus, peri urban area may be best studied in the context the various drivers of development, which affects the extent and nature of development. Peri urbanization concept thus becomes contextual, which varies according to the direction and drivers of growth in the peri-urban areas. The peri-urban areas accommodate expanding population i.e. the spillover population due to the sprawl: this population triggers several challenges on the peri urban areas such as natural resource depletion, environment, social and ecological challenge. However, careful analysis and case studies show that these highly dynamic areas have potential for a holistic planned intervention to not only decongest the urban core but also create a more symbiotic rural urban linkage. Challenges pertaining to urban, such as the global issue of degraded city environments, also can find a solution in the peri urban interface whereby development has only commenced and control is still within the possibility and scope of the authorities. Establishment of context specific, evidence-based framework for development and setting up of green byelaws for these areas in the initial stages of transformations can lead to not just abating degradation but also can prove to be beneficial in regenerating the balance of the ecosystem of urban

areas. Therefore, there is an immediate need to examine the behavior of these areas in terms of the activities, the development and the environmental resources when cities grow and urban expansion occurs. Thus, sensitivity should be there towards planning for the dynamic ecosystem of the peri-urban areas by initiating in the early development stages, a holistic, environment sensitive planning approach.

ACKNOWLEDGMENT

The research has been completed under the guidance of Prof. Sanjukta Bhaduri, Prof. Nilanjana Dasgupta Sur, and Prof. Kavas Kapadia. I am extremely thankful to my mother for her support during the entire course of this paper. Late Shri Dr. P.D Tiwari, my father is the inspiration and the motivation behind the work for which I would be grateful forever.

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