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Social and Environmental Transformation in the Indian Peri-Urban Interface – Emerging Questions

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Social and Environmental Transformation in the Indian Peri-Urban Interface – Emerging Questions

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Urban spaces emerging as nodes and drivers of global capital are recognized as centres of economic growth; while the rest of the geography is consigned to the residual category commonly referred to as 'rural'. Diversity and increasing numbers of urban centres do not seem to alter this dichotomous perception of urban-rural landscapes and this dichotomy extends to policies and institutions. Nevertheless, the diversity in expansion and extraction pattern of the urban core is reflected in the way it transforms and interacts with its peripheries, fostering types of interfaces that depict urban and rural characteristics and processes to various extents.

Even though the literature on the Peri-Urban Interfaces (PUI) of India does not imply a simplistic unidirectional rural-urban gradient, neither the dynamic inter-linkages within these peripheries nor their diversity have been analyzed with their inherent complexity. Literature on Indian PUIs explores ecological, social, institutional and livelihood transformations in PUIs with scant attention to governance and institutional aspects. This leads to generating policy blind-spots and a governance vacuum in the PUIs. The asymmetric attention given to the 'urban' and the 'rural' compared to the 'PUI', thus extends to the physical and social transformations vis a vis governance of the PUI. This blind-spot could potentially accentuate social disparities, so vivid in times of rapid global change which is more or less urban in character. This fear is reinforced by the fact that a less extractive and less exploitative urbanisation process, less damaging if not beneficial to its peripheries, is increasingly rare to find. As urbanisation in various forms is here to stay and since Indian PUIs will continue to grow in numbers, this fear appears legitimate. This paper looks at selected literature on PUI of the global south, to identify diverse urbanisation processes in order to arrive at a typology of PUIs, their roles and the missing attention to them.

Keywords: peri-urban interface; peri-urban typology; urbanisation; urban periphery, peri-urban governance

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The United Nations estimates that 61 and 40 percent respectively of population around the world and in India, will live in cities by 2025. The expansion in the number and size of cities creates many push and pull factors accelerating the movement of people from rural to urban and its peripheries. Cities historically formed around centers of trading (Ellis 2007), later on emerging as nodes of global capital that thrived on the natural and human resources of their fringes and of the hinterlands. Economic forces that drive rapid changes in the social-ecological systems of the peripheries rarely recognize their own stakes in and dependence on the sustainability of peri-urban interfaces (PUI). Recognition of PUIs as crucial for societal welfare is abysmal compared to our recognition of completely natural and heavily human-modified systems. The predominant focus of academic literature and policy discourses still hovers around any of the following systems - production, heavily modified or entirely natural. The spaces falling in between any two of these relatively homogenous landscapes are mostly overlooked, in spite of their burgeoning presence.

Expanding large cities inflict externalities on the peripheries through fast growing, changing and exotic consumption patterns and lifestyles of their dwellers and through economic activities. The urban fringes are thus dynamically transforming social, economic and ecological backyards of the emerging 'urban cores' of power, policies and money. This constitutes the peri-urban socio-ecological subject that appears to fall through the cracks between polarized rural versus urban or protected versus production area approaches in policy making, governance and scholarship. In conceptualizing the peripheral locales where new socio-economic and ecological interactions coalesce, conventional bi-polarities have to give way to thinking of the rural to urban as a continuum with the idea of the 'peri-urban' in between.

I Evolution of PUI in academic literature

It was early land-use models and spatial analysis (University of Nottingham; University of Liverpool 1999) that first visualised the rapidly expanding urban spaces that were slowly penetrating into rural demography, creating a somewhat delicate interface between the two. Later on, limitations of these models in terms of oversimplified economic, social and cultural complexities gave rise to the realisation that the dynamism within peri-urban areas needed to be explored by social, natural and economic sciences.

Attempts to define the Peri-urban Interface (PUI) had began much earlier - as a 'zone of spatial contact between town and country' in Mortimore and Wilson (1965)¹. In the 1980s, the Office of Rural and Institutional Development (ORID) in the United Kingdom and the OECD (1979) started extensive usage of the term 'peri-urban' in the context of prioritising areas for aid activities. Following this, PUI literature experienced a long vacuum before the next significant work, notable for depicting ecological footprint as 'appropriated carrying capacity' of modern urban economies, by Rees (2006). Subsequently, new labels started emerging for PUI - 'suburban extension', 'satellite town', 'urban-rural fringe', 'urban transition zone', 'semi-urban' and 'rurban'. Currently these are used interchangeably with 'peri-urban'.

At this stage, literature on the peri-urban phenomenon can be broadly classified into four:

1. literature deliberating the idea of PUI,
2. that which discusses linkages of PUI with other landscapes,
3. literature that delves deep into the influences and impacts on PUI, and
4. literature concerning institutional and governance status in PUI.

While studies on the notion of PUI and the character of PUI in India emerged in the early years (Brush 1977; Brush 1968), linkages of PUIs with cities was explored later (Ramchandran 1989; Fazal 2013) as also the influences and impacts of cities on the peri-urban (e.g. Tacoli 1998; Kundu et al. 2002). The latter got close attention from the academic as well as policy literature, though there is no clear chronological pattern observed in the emergence of the last two categories mentioned above. Policy recommendations, institutional intricacies, social inequalities as well as an in-depth analysis of livelihood issues are uncommon in the literature on PUI (McGregor et al., 2006).

The first two categories of literature adopted a positivist approach aiming at new research fields of policy and planning of infrastructure and governance in PUI, while the third category featured arguments both for and against urbanisation. Pro-urbanisation literature highlights the potential of PUI to generate new employment (Mycoo 2006), to reduce rural poverty and to trigger pro-poor economic growth (Allen et al. 2006; Parkinson and Taylor 2003; Venugopal 2012; Tacoli 2003).

¹ Though the term is used in earlier literature, a discussion on the concept or definition of PUI has been missing.

Anti-urbanisation literature on the other hand highlights over-exploitation of natural resources, social impacts of waste-disposal and water-pollution from expanding urban cores, and threat to food production (noted in Freidberg 2001). Largely failing to take a comprehensive and balanced approach to the complexity of the PUI, this polarity in studies, reports and policies in tandem with the conventional and convenient dichotomy of 'rural' and 'urban' that generally pervades socio-economic and ecological thinking, probably contributes to a lack of clarity and solutions in PUI writings.

II PUI of the global south

In emerging economies, development in the outskirts of metros where urban and rural development processes meet, mix and interact is a continuous process rather than the end-result of urbanisation. As cities continue to grow and peri-urban areas move outwards in ripples, waves of impact could be of geographic expanse and/or socio-economic composition. This dual ripple effect has been most rapid in the global south, than in the north (United Nations 2014). While global growth rate in urbanisation has been 4.5 per cent per annum, growth of the urban south has been seven times that of the north.

In India, urbanisation is evident in nearly 431 Class I cities², many of which are spreading their wings laterally (Pandey et al. 2013) into the rural. Estimated population growth rate in the PUI of India's major cities has been more than that of their respective city core (Sivaramakrishna et al. 2005). Among the 53 metropolitan cities of India, three mega cities (Delhi, Mumbai and Kolkata) show more significant lateral growth than in-filling of existing city space. The latter is still observed in smaller metros (World Bank 2013) of the country, nearly 50 in number. Wherever growth is more rapid in the periphery than the core of the city itself, the dynamics and the outcome are often referred to as 'urban agglomeration' (Census of India 2011).

Despite the scale of prevalence and importance, a rigorous conceptual framing of Indian PUIs is difficult, though case studies are many (e.g. McGregor et al. 2006; Banerjee-Guha 2010; Nautiyal 2011). While empirical studies cover a wide array of themes from environment to institutions, others still deliberate definitions and distinctions (Marshall et al. 2009; Narain and Nischal 2007) woven around the concept of PUI.

Analysing literature on patterns of transformation in PUI, this paper identifies crucial pointers towards PUI governance. The next two sections characterize and classify the PUIs. Governance and institutional gaps are identified in section V. Empirical observations on socio-environmental transformations are discussed in section VI, before drawing out pointers for PUI governance in section VII.

² The Census of India categorises cities in accordance with their population into six categories (Class I to Class VI). Class I cities are cities with a population of one lakh or more.

III Characterizing the PUI

PUI can be characterized either as a space, a concept, a process or as a combination of any two or all these. As a place, it can refer to rural fringe areas surrounding the urban. As a concept, peri-urban could be seen as an interface of rural and urban activities and institutions. As a process, it could be perceived as two-way flow of goods and services, a transitional phase between the rural and the urban or as the moving periphery of large metros. PUI in any of these forms remains alien to many, mainly because it still remains as an open question – is PUI a mixture of rural and urban features or is it a zone of gradual transition from rural hinterlands to urban core?

Early definitions (debates in Mortimore and Wilson 1965; McGee 2005) view PUI more as a spatial location while later studies look at it as changing social structures or institutional landscapes (Allen 2003). Department of International Development (DFID) uses a bi-zonal definition (University of Nottingham; University of Liverpool 1999), while Simon et al. (2003) sees it as an ‘approximate continuum’. Douglas (2006) depicts PUI as a multifunctional area experiencing direct and indirect impacts of urban sprawl like rapid change in land use and quality of natural resources, resembling a transitional phase (Narain and Nischal 2007) which in turn is close to a ‘Rurban’ character (Gupta, 2015).

Taken together, definitions of PUI encapsulate the spatial, functional and process typologies. They reflect a transitioning phase from rural or urban origins; co-existence of residential, industrial and agricultural land uses as well as habitation by mixed groups of poor and rich. Being the confluence of problems and prospects of both the rural and the urban, and consisting of diverse communities and land use, PUI is difficult to be assigned to any single box, except for its geographic closeness to the city core. Diversity in definitions of this dynamic and multi-dimensional social-scape implies that no single definition can characterize it meaningfully, unless couched in functional terms or discrete spatial boundaries. Although the above mentioned range of dimensions and components portray conspicuous features of PUI, not all PUIs are comparable; making it essential to differentiate various types of PUIs.

IV Peripheries of old, new and the subaltern urban

Urban peripheries appear to be significantly differing in the impacts driven by their neighboring urban core. While metros drive the emergence of a clear PUI around them, the peripheries of towns urbanized by indigenous forces retain most of their characteristic land use and social structure. Taking PUI as part of urban agglomeration where major changes take place over space and time, Iaquina and Drescher (2000) identify five types - village, diffuse, chain, in-place, and absorbed PUI. Village peri-urban areas are rural areas with urban consciousness, with socio-psychological transformation akin to that of urban core than to its geography and size³. Diffuse peri-urban areas

³ e.g. rural Kerala and *malnad* districts of Karnataka.

on the other hand are close to the city, formed by settled migrants from different locations⁴. Chain peri-urban areas refer to fringes close to the city that undergo settlement based on chain migration⁵. In-place peri-urban areas are also close to the city, but resulting from *in situ* urbanisation – an indigenous process triggered by local development supplemented by in-migration⁶. Absorbed peri-urban areas could be either proximate areas or in-place or chain peri-urban areas, absorbed by the city-core over a course of time⁷.

Close to the in-place PUI in Iaquina and Drescher (2000) is what Denis et al., (2012) call ‘subaltern urban’ – an urban area distinct from large metros, mostly towns urbanized by indigenous forces. As a process, subaltern urbanisation is less driven by distant external drivers, and exhibits relatively beneficial backward linkages with the rural, compared to metropolitan urban cores (example from Uttar Pradesh, India in Himanshu et al. 2011). Roy (2011) points towards two prominent themes in subaltern urbanism - economies of entrepreneurialism and political agency that paves it very differently from the almost spontaneously mushroomed PUI of a sprawling metro city. Here Dupont (2007) reminds us that while conceptualizing the diversity of PUIs, we need to reckon that forces other than the urban sprawl could form and influence the peripheries as a result of a mix of planned operations and unplanned and/or uncontrolled processes. Peri-urban areas of large metros also (complementing the five-fold classification of PUIs in general by Iaquina and Drescher (2000)) can be classified further into two categories based on history and the underlying performance of primary and secondary sectors. This classification distinguishes ‘neo-peri-urban’ from the ‘old-peri-urban’ based on features like time, extent and pace of conversion of agricultural land (more rapid and rampant in the neo-peri-urban) in favor of real estate, industries and/or infrastructure. Agricultural practices carried out in pockets of both these PUIs include exotic and modern crops demanded by the city, though PUIs of the old urban continue to cultivate traditional food crops to some extent. In short, PUIs of the newly urbanised areas reflect transformation that is triggered mostly by neo-liberal policies and infrastructural development, whereas old-peri-urban areas emerged in the pre-liberalization era (pre-1990s) generally as residential areas for expanding population employed in the secondary sector (both public and private) located in the then large towns.

Peripheries of metro cities, and towns urbanized by proximate drivers differ in terms of their distinct urban linkage, such as - a) expansion of residential areas (of the poor, middle class or the elite) and of industries, often characterized as suburbs or satellites of a centralized locale of economic activity where secondary and tertiary sectors proliferate; b) production areas of perishable food commodities for the city (e.g. milk and vegetables); c) dumping sites for the waste generated in the urban core; and d) extraction areas of construction materials (e.g. granite, bricks and sand).

⁴ e.g. suburbs of Kolkata.

⁵ e.g. shanties of rag-pickers from different states of India in the outskirts of Bangalore and Reddy camps of people from Andhra Pradesh cultivating paddy in irrigated areas around Yadgir town.

⁶ e.g. Anekal at the southern border of Electronics City in Bangalore with Tamil Nadu.

⁷ e.g. Yelahanka, in the north of Bangalore city.

PUI as 'source and sink' of the urban core

Is PUI a refuge of the poor from both the urban and the rural? If migration to the urban core is regulated by an inbuilt screening for the relatively well-off or the skilled (Kundu and Ray 2012), this could be true. Urban sprawl selecting the relatively better-off and confining others to the fringes, translates into utilization of the peripheries as a source and sink of human resources for activities in the core. As socio-economic class becomes the new caste (Mann 2012) in urban society, PUIs become the refuge of the manual workforce employed in the urban core, marginalized by urban land grab for infrastructure and housing. Often, the unskilled urban poor generally employed in industries or in the urban informal sector located in the city fringes (Sharan 2004) 'illegally' settle in low quality spaces in the vicinity of city sewage lines. Rural poor, the conventional migrants, often end up in the same fringe areas, due to unaffordable central spaces and congested inner-city settlements leaving no space for newcomers. Otherwise these seasonal migrants set up temporary settlements within the core city too.

In the fringes of large cities, where the urban better-off also move in search of larger and greener spaces (Dupont 2007; Schenk and Dewit 2001), the PUI bifurcates into two, segregating the rich PUI from that of the poor. The core areas of smaller towns generally possess housing projects for the low and middle income groups as also islands of poorer slums. Ramchandran (1989) observes PUI dynamism in four significant interrelated but sequential stages: socio-economic changes, land-use changes, changes in social life of people living in the fringes and, emergence of new residents.

Thus, the complexity of the PUI is attributable to multiple stakeholders in a very dynamic time and space that provides contrasting outcomes to the poor in terms of opportunities for employment, access to infrastructure; and in terms of uncertainty, debts, and polluted environment. In all the processes above, more and more poor (than elite)- urban as well as rural- go through the process of segregation, degeneration and exclusion within the urban fringes of rapidly growing cities, which tend to expand - and gradually nurture - only urban activities. Such a process involving the new, clean and somewhat planned urban city and degenerated and excluded urban periphery is said to be the making of a 'political time bomb' (Kundu et al. 2002; Verma 2002). This implies that drawing a clear framework to formulate and analyze governance measures for the PUI may be a challenge, but undoubtedly a crucial step towards socio-ecological sustainability of emerging economies.

V Governance and institutional gaps in Indian PUI

As mentioned in the beginning, over time, the drivers and patterns of urban growth have been changing from trade centric to service sector driven neo-liberal growth. The conventional urbanisation pattern of over-crowding resulting from concentration of trade and services has transitioned to spatial expansion and extension of city limits into laterally sprawling metropolitan areas. This changing process, though conspicuous in India, does not get reflected in governance structures. This increasingly complicates the reciprocal relation and executive boundaries between the urban

and the urbanizing rural in its peripheries. Though they host land uses and population size of the urban, and are organically linked to both the urban and the rural, PUIs in India have been governed for a long time by rural administrative units called *panchayats*⁸. This has taken functions like sanitation and garbage disposal outside the purview of PUI administration. Moreover, a preoccupation with urban land use planning has had many social-ecological repercussions spanning the rural and the PUI.

Figure 1 below picturizes how various urban entities locate themselves with respect to each other and interact. There are urban areas without a PUI (e.g. MY₁ and MY₂); with a larger shared or overlapping PUI (e.g. C₁, C₂, C₃ and C₅) which could be outgrowths of a larger city (e.g. C₃) along the intercity corridors. Often urban areas driven by indigenous economic forces evolve into subaltern urban (described in section IV) with a low intensity peri-urban (e.g. C₄). Figure 1 also helps imagine the transitional urban entities of Town Panchayats that may be part of a large PUI (TP₁ and TP₂), or an independent entity (TP₃), as also typical Metro (M₁, M₂) and Mega cities (MG₁) along with their PUIs (PUI₁, PUI₂, PUI₃).

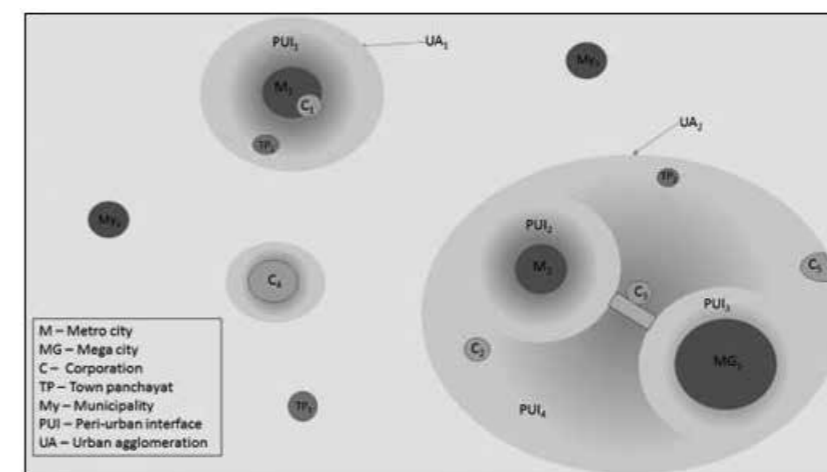


Figure 1: Visualising the urban and peri-urban spaces

V.1. Defining urban spaces for administration and governance

Categorization and nomenclature of urban spaces differ between census, statutory and constitutional typologies. Urban spaces identified by Census of India are administratively defined and described by the respective State Governments following the guidelines provided in the Constitution of India. The remaining geographies by default fall into the rural (Sita and Bhagat (2005) discuss the implications and consequences of this casual definition of the 'rural') and are categorized based on administrative jurisdictions. This includes administrative revenue classes known as panchayats (rural self-government) at various levels: village panchayat (defined by the statutory authority of

⁸ Almost in cities, but still "villages" (Bageshree 2014).

the province), intermediary classes (nagar panchayat / block panchayat / others) and then, the district panchayat.

While generating population data, Census of India identifies urban spaces according to the following criteria: a) population exceeding five thousand b) population density of four hundred and more and c) at least seventy-five percent of the male working population engaged in non-agricultural pursuits. These are then called 'Census Towns'. Each State is free to determine its own criteria to further qualify these urban areas or to declare areas outside census towns as urban statutory bodies. Thus the totality of urban spaces consists of statutory towns and census towns.

With the 74th Constitutional Amendment (Article 243), from 1992 onwards the constitutional classification of spaces as 'urban' and 'rural' in India, also includes transitional zones⁹ like 'Nagar Panchayat' for areas in transition from rural to urban. This classification of any space as a 'transitional area' or 'nagar panchayat' again varies from State to State. The categorization of transitional spaces holds significance for their agricultural and non-agricultural linkages and rural/urban processes.

State governments' classification of urban (and semi urban) spaces include categories like municipality, corporation, nagar panchayats, industrial towns and cantonment areas, clubbed together into a class known as statutory towns. Each State (province) defines the qualifying criteria for categorizing a space as any of the above. The criteria and thresholds¹⁰ being State specific, a space that may fall in a particular category in a particular State, may fall in a different category in another State, generally reflecting the terrain and urbanization history of the region.

Transitional areas are represented not only by Nagar Panchayats but also by what is known as 'out growths' – another category created by the Census of India. Out Growth is a village / hamlet / enumeration block lying contiguous with a Statutory Town, but outside its limits, and has urban features like infrastructure. Each such Statutory Town together with its out growth(s) is treated as an integrated urban area and is designated in the census as an 'urban agglomeration'. In the decade between 2001 and 2011, Indian urban landscapes showed a near three-fold increase in the number of Census Towns and substantial increase in the number of Urban Agglomerations and metros, as shown in Table 1.

⁹ Constitution of India - Article 243Q (1) (a).

¹⁰ Specification for population range for any given category could differ among the states. E.g. 'municipal council' may be formed in Karnataka with a population between 20,000 and 300,000; in Himachal Pradesh between 5,000 and 50,000; and in Haryana between 50,000 and 300,000.

Table 1. Growing dominance of census towns in India

Classification	2001	2011	Percent change (%)
Statutory Town*	3799	4041	6
Census Towns**	1362	3894	186
Urban Agglomeration**	384	475	24
Out Growths**	962	981	2
Metropolitan areas*	35	53	51

Categories defined by * Constitution of India and relevant statutes; ** Census of India
Sources: Census of India (2011), Ministry of Urban Development (2013)

The definitions of urban spaces in the Census and by the State authority mentioned above are primarily based on demographics and to an extent also on the economic character of such spaces. Researchers and academics on the other hand take into account the historicity, nature of processes and other social and cultural factors of the place (e.g. PUI typology in Iaquina and Drescher 2000, 'Subaltern Urban' in Denis et al. 2012). Both statutory and academic classification of urban spaces also take note of the varied pace at which the process takes place in different locations.

V.2. Prescription and implementation of 'transition area' governance

Even though the 74th Constitutional amendment created the category of 'Nagar Panchayats' to deal with an increasing number of emerging PUIs of the country, most states have not been able to designate significant number of eligible areas as Nagar Panchayats and /or provide them with the organizational and institutional support mandated and necessary¹¹. Thus the growth in number of Nagar Panchayats (in Table 2) does not reflect the dominance of Census Towns in Table 1. Tamil Nadu was the first state to constitute 'Town Panchayats' (in 1993) as transition areas between the rural and the urban¹².

Table 2. Local Administrative and Governing Bodies

	1998	2005-10	2010-15
Municipal Corporations	96	109	139
Municipalities	1494	1432	1595
Nagar Panchayats	2092	2182	2108
Village Level Panchayats	232278	236350	239432

Source: Finance Commission Reports (1998, 2010 and 2015)

¹¹ Shaw (2005) highlights the varying status of designated transitional areas in different states of India.

¹² Tamil Nadu had 'Town Panchayats' under the District Municipalities Act (1920) to govern division/ taluk headquarters, tourist spots, pilgrim centers and commercial/ industrial towns, along with City Municipal Corporations and Municipalities to govern other towns.

This gap between constitutional prescription in designating 'Nagar Panchayats', and actual governance change in PUI is apparently due to the following reasons: a) they fall in a 'land of misplaced policies' –being either municipality (urban local body) or panchayat (rural self-government) in formal definitions and often end up without any protagonists; b) vested interests in keeping the land use conversion and building rules ambiguous enough to exploit land value escalations and mining potential; c) as it is the state government's prerogative to define the criteria and bring in governance changes, they often do not take transition areas seriously, deterred by the fear of not getting enough development or poverty reduction funds from the central pool, once transition to urban is shown to be high; and d) the fact that rural areas would not have to pay for basic amenities for which the Urban Local Bodies charge their occupants.

Hence, though PUI like their urban counterparts are in need of governance and management of housing, solid waste and sewage, sanitation, biodiversity and water supply, the above reasons give rise to a tendency not to designate population-wise de-facto PUIs as town panchayats. Thus negligent monitoring and implementation of pollution and other environmental safeguards give way to extensive mining, degradation of water bodies and conversion of rural land use, as transition areas remain governed by rural governing bodies that are not empowered to provide basic civic amenities that are more urban in nature. A resultant under serving of these economically important areas make them free-for-all zones (Pradhan 2013). A lack of recognition of the coalescing interfaces of the urban and peri-urban in a composite urban agglomeration and the consequent fractured governance result in under-service to the inhabitants at best and denial of necessary amenities at worst (McGranaham 2006).

Thus, even though urban in terms of population, but occupationally mostly still in the primary sector, PUIs envisage a hybrid governance. They need to be better equipped and mandated to provide various civic amenities and basic services as in urban local bodies, while ensuring sustainability of primary sector activities as in Gram Panchayats. Evolution of urban agglomerations and metropolitan areas is supposed to take cognizance of such nascent dynamics in the rural-urban interface and processes. Constitutionally envisaged 'metropolitan committees' exist more as paper-tigers or non-starters. Lack of such hybrid institutions for PUIs can lead to fragmented implementation and chaos not just in PUI but even within the jurisdictional boundaries of respective adjacent urban cores in an urban agglomeration (Lama-Rewal and Zérah 2011).

The above-discussed strategic oversight resulting in a governance vacuum in PUI also translates into a legal pluralism that breeds ambiguity and imparts immunity to illegal land conversions, mining etc. This is despite some evidence where line agencies of the government effectively loop-in non-governmental agencies in managing natural resources and solid waste generated in town panchayats (for local initiatives in Indian mega cities see Shaw (2005)).

The currently prevailing Master Plan approach to urban planning heavily relies on spatially explicit models in land use planning and structural systems, while omitting social-ecological realities (discussed in section VI.2) and potential impacts of expanding peripheries. These and other management issues in urban-peri-urban governance suggest a shift from the Master Plan approach, to an 'Action Research approach' (Harris 2014) to foster strategic and inclusive environmental governance at the grass roots.

VI Why think differently about governing the peri-urban?

Following the discussion on an institutional/ governance void in PUI, this section elaborates on some of its repercussions.

Providing a framework for examining the complex and dynamic world of PUIs based on strategic, participatory and indigenous principles, Allen (2003, pp.146) suggests that PUI is a type of support system where the 'value of configuration is much more than the sum of its components'. Taking into account this fact as well as the diversity of PUIs, we need case studies on specific aspects to provide insights into bridging the governance gaps. Empirical studies on issues related to social, economic, institutional or governance aspects and ecology of peri-urban areas started appearing in peer reviewed literature from 1990 onwards. Most of them discuss the impact of expanding habitation and increasing urban demand for natural as well as human resources, touching on issues of environment, livelihood, land conversion and acquisition. Here we group empirical observations from such PUI literature into broad overlapping categories related to: environment, socio-economic changes, agriculture, and migration.

VI.1. *Environmental concerns in the peri-urban*

PUIs provide food, water, construction materials etc. for the city populace as well as house some manufacturing industries. They also act as a sink for cities' sewage, household, medical and other kinds of waste. Concerns about environmental contamination and its effects on populations living in the margins of cities and peripheries started to be voiced since industrialization. Discussions about the impact of the twin indicators of development – industrialization and infrastructure - on soil, water, biodiversity as well as on farm produce and human health appear in academic research on PUIs. They however rarely figure in policy discussions.

Attention was drawn by Freidberg (2001) to the political-ecological issues of peri-urban Africa in the form of community resistance to the expansion of cities on the grounds of ecology and livelihoods. Environmental hazards in the PUIs across Asia - in Manila, Dhaka and Chennai - are well recorded (Davis 2004; Dahiya 2003; Ruet et al. 2006). A study conducted in the peri-urban locations of the holy city of Varanasi identified severe loss in yield of wheat, mustard, green gram and leafy vegetables due to air pollution (Agrawal et al. 2003). Plenty of studies demonstrate linkages between water contamination and human health hazards in peri-urban areas (Afrane et al. (2004)

in Ghana; Birley and Lock (1998) in India; Nabulo et al. (2012) in Uganda). Water seems to be the most important issue in PUIs across the world (Mehta and Canal 2004; Marshall et al. 2009) as poor peri-urban families end up spending most of their income on potable water or health care and/or else succumb to water borne diseases. Higher levels of morbidity, especially female morbidity was observed by Srinivasan and Ratna Reddy (2009) in the villages downstream of Musi River in peri-urban Hyderabad, leading to significant economic loss borne by small and marginal farmers.

Other case studies like Parkinson and Taylor (2003) discuss decentralized wastewater management systems in peri-urban areas of India, Pakistan, Bangladesh, Senegal and Indonesia. Implications for environmental management in the PUI have been discussed in William et al. (1999) looking at the impact of rapid urbanisation on land cover and land use, changes in physical and residential environment and challenges in managing these changes in peri-urban Accra. This study recommends sharing of responsibilities by national as well as local agencies with effective co-ordination between departments and capacity enhancement of districts in planning, developing and provisioning of environmental services, particularly in the case of waste disposal. Land use analysis combining spatial and quantitative models by Ramachandra et al. (2014) for the period between 1977 and 2010 found more than 638 percent increase of built-up area in and around the city of Delhi and recommended strong and conservative urban planning that takes into account natural resources and people's livelihoods.

Environmental issues of the PUI also appear in discussions on land conversion (in Gurgaon, Delhi: Narain, 2009), land acquisition and their implications (in Nigeria: Binns and Maconachie 2006). Across the developing economies of Asia and Africa, identified impacts that cities inflict on the peripheries include resource degradation and depletion as well as waste dumping. Tacoli (2003) talks about these around the twin cities of Hubli-Dharwad, Caracas, Hanoi, Bamako and Ouagadougou; while Losada et al. (2006) discuss this for the cities in Mexico. Studies looking at the effects of land use change and the fragmented mosaic of social, spatial, political and administrative aspects affecting sustainability of the peri-urban zone in Nigeria and Mexico city (Binns and Maconachie 2006 and Diaz-Chavez 2006 respectively) conclude that competition for land (fueled by land hunger and insecure land tenure), loss in soil fertility and water pollution have led to severe environmental degradation that make traditional agrarian livelihoods a difficult proposition in the PUI.

In the above discussions on the cusp geographies of PUI, if the social inequality question is rarely found, the role of the governance vacuum is conspicuous by mere absence.

VI. 2. *Socio-economic issues in the peri-urban*

Socio-economic issues of PUI are exemplified in migration, loss of (and change in) livelihood options and land conflicts. These are often studied empirically to understand the impacts on livelihood security as well as on the social fabric of the locality (Shindhe 2006) whose landscape gets altered too much and too suddenly. Income per acre of land, health expenses, herd size of livestock as well as dairy intensification are found to increase towards the urban (from rural) (Ramalingegowda et al. (2012) for peri-urban Bangalore, Brook et al. (2006) for areas around the twin cities of Hubli and Dharwad in Karnataka), while biodiversity is reportedly improving in the opposite direction i.e. urban to rural (Nautiyal 2011 - around Bangalore). Land conversion, land acquisition and their societal implications also appear in recent social science literature on PUI (in Gurgaon, Delhi: Narain 2009; in Nigeria: Binns and Maconachie 2006).

Issues (other than land conversion) around new highways connecting the rapidly growing cities like Chennai, Bangalore, Bombay and Pune that extends the PUI of these connected cities along the highway is a case in point¹³. Evidence suggests that diversification of rural livelihoods to non-farm jobs is rapid when there is consumption growth in neighbouring urban centers. The paradox is that, this association is apparently stronger if the urban center is a smaller town than if it is a large city. Himanshu et al. (2011) talks about this paradox in the context of Palanpur in UP, India, lying in the outskirts of the city of Moradabad. Denis et al. (2012) is another study pinpointing the fact that the net impact of metros on their PUIs turns out to be less beneficial compared to that of indigenously driven and slower urbanisation around smaller cities.

Some recent studies concerning livelihoods explore the actual impact of new livelihood options for the PUI residents. Mycoo (2006) reveals the opportunities, complexities and unintended or unforeseen outcomes that came with promotion of 'heritage tourism' in the PUI of St. Louis. In fact, tourism can be seen as an after-effect of urbanisation since urbanites want and can afford occasional getaways from their concrete jungles and hence tend to frequent natural forests, farmlands or plantations. Again this acts both as a livelihood opportunity and a threat (in China: Yang et al. 2010¹⁴) in terms of land and water grabbing, cultural intrusion and pollution.

Cities merely using the PUI for oiling a huge and growing economy ignoring the socio-ecological shadows they create are likely to be driven by external drivers (distant markets and imported human resource). The 'source and sink' treatment meted out to PUIs by the urban core is aided by the mismatch of governance structures and institutions as mentioned in section V. The intricate linkages of PUIs with both the rural and the urban make a case for policies, governance mechanisms and infrastructure to reap this potential to diminish disparity (between rural and the urban, as

¹³ Belt (2008) gives examples of perils and prosperities linked with the Golden Quadrilateral highway project in India.

¹⁴ For a brief on how tourism cannot do without a damaging footprint see 'Tourist does leave a footprint' (Phalkey and Purushothaman 2010)

well as between rich and the poor), a common by-product of capital-driven economic growth and growth-driven urbanisation. Can we envision active integration of PUIs into the urban economy for inclusive growth, reducing the above mentioned unfair footprint of urbanisation?

Echoed in RUrbanism (Revi et al. 2006) is this integration in imagining ruralized cities (in terms of quality natural resources and minimal negative externalities) and urbanized countryside (in terms of roads, education and health care) that are possibilities if we can transform the bi-polarity of a completely remote 'rural' versus completely 'urban' in societal thinking, policy making, governance, institutions and lifestyles (Gupta 2015).

VI.3. *Agriculture and Gender in the peri-urban*

Peri-urban farms unlike their rural counterparts are known to entirely focus on feeding the city's capitalist economy, becoming an instrument of urbanisation as well as acting as the city's sink and source in many ways (as mentioned in VI.1 and VI.2 in the context of socio-economic and environmental issues). Here farms are more or less always commercial in crop choice, make intensive use of synthetic inputs and exploit ground water (Nautiyal 2011 – for a case study around Bangalore). This often lends the impression of an empowering agrarian change around cities but its long term welfare implications are less explored though the repercussions of receding ground water table and mounting debt in sinking many borewells are easy to observe. A ranking of different cropping systems according to economic profitability (Vagneron 2007) reveals highly polluting systems like shrimp and fish farming as most rewarding compared to relatively less polluting vegetable and rice cultivation in the PUIs of Bangkok. Does it mean that the ecological and livelihood shocks and indebtedness are an inevitability for PUI farmers? It need not always be the case, if health conscious urbanites can trigger a significant demand for safe food¹⁵.

Urbanisation and resulting peri-urbanisation have also been cited as causes of agricultural feminisation, described as a relative rise in women's participation in the labour force as well as decision making; taking on traditional male bastions. Agricultural feminisation in the PUI need not be a 'distress-driven phenomenon' unlike feminisation of rural agriculture (Chand and Srivastava 2014). Most PUIs experience and promote new agrarian economies of one form or the other¹⁶. The peri-urban livelihoods can generate both farm and non-farm employment opportunities, where both men and women earn, unlike in rural contexts. At the same time, there are contrasting cases observed in some PUIs: Gordon (1993) asserts that capitalistic forms of agriculture in peri-urban areas resulted in an adverse predicament leaving peri-urban women of South Africa in poverty and insecurity.

¹⁵ Organic farmers' groups around the city of Bangalore feeding retail outlets of organic agricultural products (Devakumar and Shankar 2014).

¹⁶ Agricultural livelihoods in the peri-urban are described (FAO 2007 and Marshall et al. 2009) as farm units close to town, which operate intensive semi-or fully commercial farms to grow vegetables and other horticulture, raise chickens and other livestock, and produce milk and eggs, enlisting potential agricultural jobs and incomes as opportunities emanating from urban and peri-urban spaces.

Infrastructural expansion of the urban core has been known to make rural women working in the fields near highways more vulnerable (Sharma 2013). PUIs are also characterised by large numbers of women commuting for work in factories and other establishments in the outskirts of cities. Women from PUIs working in the garment and food processing industries around Indian cities travel much more for work than their counterparts working as domestic helps or as housekeepers in the city core; or their rural counterparts engaged in agricultural work. It appears that the gender dimension of impact varies considerably and is determined by the availability of commuting facilities, employment options at the place of residence, land ownership, family size and skills at hand.

A study on peri-urban areas of the city of Aligarh highlights the increasing urban demand for dairy products. Households in the peri-urban areas increasingly undertook dairying activities with women of the household contributing more than men (Banu 2012)¹⁷. However, a study around the city of Hyderabad finds that women prefer to cultivate leafy vegetables and fodder compared to dairying (Devi and Buechler 2009), attributable to factors like land owners' preference for women tenants and prevalence of differential wage rates in vegetable production. Though PUI women are considered more reliable to lend land to, as in rural areas generally men are the land title-holders in PUIs too, which assumes significance on many counts, including but not limited to access to credit and membership and participation in various formal and informal associations (Devi and Buechler 2009). Another study on the small industry of canning (packaging) of fruits in the peri-urban area of Mexico notes that even though women are integral to such activities, they do not vie for large credit, operate with less capital and confine their marketing to local networks (Buechler 2009).

VI.4. *Governing a transitioning rural-urban interface hosting migrants*

Migration plays a crucial role in enabling PUIs in performing the 'source' and 'sink' functions for the urban core in terms of human resource. This role of PUIs varies between cities - significantly driven by external factors around metros. While neo-liberal urbanisation processes driven by distant factors and agents attract large numbers of skilled and white collar labour (e.g. IT industry in Bangalore); subaltern processes of urbanisation generally do not showcase snowballing migration of the skilled. It may not even attract large numbers of the unskilled but may instead support their primary rural livelihoods, providing sustained demand as marketing hubs or small scale industries. The PUI will be less distinct and extensive in such a process of urbanization where the economy is mostly driven by labour intensive small to medium scale industries. This does not attract huge numbers of migrants from various places and would not leave a significant transitional area between the city and the rural but rather could be an extended landscape dotted with small industries and townships that facilitate intra-state pendular migration. The townships of the subaltern urban may leave some externalities at their fringes, the scale of which is distinctly smaller than the extensive

¹⁷ The study reveals that 87 per cent of the working population of women in the peri-urban areas of Aligarh engage in dairying activities.

externalities in the PUI of a cosmopolitan city. Chandrasekhar and Sharma (2015) emphasize policy formulation to convert these into vibrant alternative fulcrums of urbanisation.

A caricature of such an economy is drawn here for clarity. Mandya town in Southern Karnataka has its economy traditionally depending on sugar factories, jaggery units, silk worm rearing units, and rice mills. These are fed by local farm produce like mulberry leaves (fed to silk-worms), paddy (for rice mills) and sugar cane¹⁸. This historical advantage of established and significant links between local agro-ecological products, community skills and distant markets gives rise to a kind of urbanisation that is more dynamically connected to rural production landscapes, while augmenting existing skills like weaving and sugarcane processing.

Declining occurrence of such *in-situ* drivers of urbanisation in general should have meant a burgeoning peri-urban population around major cities - much larger than it is now. Sharma (2013) observes that though several bodies, including the UN, predicted huge population growth in major cities of India, the actual rise in urban population growth did not match the estimate, as there emerged an alternative pattern - commuting to the urban core for work by migrants settled in peri-urban areas (Chandrasekhar and Sharma 2015). The outgrowth of metros into peri-urban areas (see section V.1), made the number of individuals (especially men) who would commute daily to the urban core areas increase more than expected. Compared to villages in the periphery of the urban core, remote rural areas would see migration to urban core in search of temporary casual wage employment. When these migrants over a period of time decide to stay back as hands building and maintaining the city's economy, abandoning (temporarily or for good) their rural hamlet and agricultural occupation, they choose peri-urban settlements to live in. This forms part of the process outlined earlier in the paper by which the PUI acts as a source and sink for human resources for the urban core.

Another layer added to the temporary and permanent migration to the core or periphery from the rural would be of skill levels and skill set. If the skill sets in rural areas (especially those with less productive farm lands) suit the requirement in the core, permanent migration to the urban informal sector becomes more probable. Driving, plumbing, electrical and automobile mechanics, carpentry and such-like skills provide the migration aspirant with an added edge over marginal farmers who end up as an 'unskilled' informal work-force in construction, security firms, fruit and vegetable vending etc. (Keshari and Bhagat 2012). Seasonal and temporary migration would also relate to the landholding size, though small holding size may not always mean greater vulnerability to migration. Factors like non-farm rural income, members employed outside the village, etc. influence the decision to migrate by individuals and/or families.

¹⁸ Mandya also receives some ripples of impacts from infrastructure and tourism along the Bangalore-Mysore corridor, though livelihood options in this case confine to highway-side eateries and tourist resorts.

In sum, we see two types of migration feeding the economy of the expanding urban core of a metropolitan city - temporary migration of the unskilled and permanent migration of the skilled and semi-skilled, either working and/or living in the city core or in the PUI. Are the present and proposed administrative classes of the PUI equipped to address this socio-ecological flux generated by such diverse communities of migrants to our metros?

VII Emerging pointers

The paper attempts to disentangle and illuminate the complex idea of Peri-Urban Interface (PUI) by reviewing the thematic, sectoral and conceptual discussions about PUIs in the literature. The thematic coverage of PUIs in the literature ranges from purely conceptual, societal or production related, to environmental. Even with such diverse coverage found in PUI studies, the paper finds that the inter-linkages and interactions between different dimensions, characteristic of any PUI, are missing. This leaves them incapable of informing a discourse on effective governance regimes for PUI. Though not exhaustive, the list below (Table 3) brings out this gap, depicting the pattern of issues addressed in a matrix of 47 studies. While conceptual discussion leads the tally both in single focus and multifocal studies, governance and institutional aspects are poorly addressed both as exclusive foci as also in combination with other dimensions of PUI.

Table 3. Issues addressed in PUI studies

(figures along the diagonal from top left (9, 3, 8 and 2) show the number of studies with single exclusive focus)

		Primary focus			
		Conceptual aspects	Environmental impacts	Socio-economic issues	Governance and institutional dimensions
Supplementary focus	Conceptual aspects	9	0	2	0
	Environmental impacts	3	3	4	1
	Socio-economic issues	4	5	8	1
	Governance and institutional dimensions	2	1	2	2

Empirical studies on Indian PUI do not imply a clear direction or a gradient from rural to urban in any indicators except in terms of environmental externalities. The underlying pull and push factors, forward and backward linkages and source *vis-a-vis* sink functions vary from one PUI to another, reiterating the need to recognize diversity of sustainability issues in the PUIs. Socio-political writings on PUI imply that there are not only different types of migration and migrants from peri-urban areas, but also varying causes and effects. Similarly, inter-linkages between gender and migration in PUIs are of a varied nature that needs to be explored for its simultaneously empowering and debilitating impacts on women.

Waning social institutions of rural origin are unprepared and insufficient to face the above challenges. Urban regulations and governance mechanisms on the other hand, are not sensitive to the complexity of issues including the need to target social-ecological sustainability in the PUI. These two gaps together lead to an inadequacy and mismatch of institutions for PUIs. Persistent oversight in setting up appropriate governance structures in PUIs could be a potential recipe for a 'tragedy of transition' in social and ecological terms. The governance gaps and legal ambiguity (on whether a place is exclusively urban, peri-urban of some kind or entirely rural) play into the hands of a growing greed for natural resources, making these cusp geographies vulnerable to rent seeking. Such multiple vulnerabilities make PUIs a hub of negative externalities both in terms of 'source' and 'sink' functions across environmental and human resources. Though there appears to be constitutional and popular recognition that peri-urban areas are to be governed on their own rather than getting annexed to the silos of urban or rural (in practice segregated by a free-for-all zone in between), real attempts to co-ordinate and integrate rural-urban planning and governance in such landscapes leave a lot to be desired.

Given the trend in Indian urbanisation, the potential of the PUI to act as a synergetic pro-poor interface between agricultural production and urban enterprise needs to be taken into cognizance. While the discussion here highlights the prevailing complexity of multiple and diverse characteristics (sans any clear gradient in each) and varied urbanization processes - village, diffuse, chain, new, old or subaltern- it prioritizes PUIs of metros in seeking governance solutions. This is not entirely attributable to the potential of using metros in evolving blueprints of governance regimes towards inclusive social change around other expanding cities, but is also as a result of taking into account widespread social movements in peri-urban landscapes of metro cities. This attention appears inevitable also because a less conflicting and less displacing kind of urban process is yet to gather momentum in planning and policy processes. Most importantly, this review justifies a relook at the proclaimed larger social benefits of the cycle of economic growth-urbanisation-development towards seriously pursuing subaltern drivers of development that refrain from casting large socio-ecological shadows in the peripheries.

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