Sustainable peri-village in a potential peri-urban area

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***Abstract*— With the increasing urbanization, there's an intense concern about land consumption, especially, urban expansion onto rural land. Such kind of growth addressed as peri-urbanization and to manage these areas becomes one critical issue in the spatial planning. Literature reading is carried out to understand the peri-urban areas and its challenges. The works of literature referred are based on the land use planning, rural spatial planning, suburban morphology, its dynamics, and typology. To achieve sustainable development, one shall apply integrated planning approach, micro level planning in rural land, zoning, village development plan and other such corrective planning theories.**

Keywords—land-use planning, Peri-urbanization, peri-urban morphology, typology of peri-urban, sustainable development.

I. INTRODUCTION

The urbanization rate in India is likely to go up from 27.8% in 2001 to 38.2% in 2026 [1]. Since ages, the population is increasing, and by every next step of human intervention, the urban area is becoming a center of attraction. Being the center of attraction makes it a clogged one. Urbanization in simple terms means an increase in population and the amount of industrialization. Thus urbanization is a big irony; limited urbanization leads to progress and extreme leads to deterioration of cities.

The city limits extend from core central region to the inner fringe and then to the outer edge. The villages located on the fringe are likely to be developed as the city limit expands. The fringe villages draw a large number of people into the urban-rural interface, mostly because of internal and external factors such as economic activities and access to basic needs. The rapid urban expansion process has authorized some of the lands to state urban development authority and other areas to the villagers. The villagers tend to convert the agricultural land for urban use, which has led to the haphazard development of land without prior planning according to the land use. The random coming up of buildings hinder the pace of growth, and thus it becomes difficult to provide infrastructural facilities and amenities.

The purpose of current literature study is to understand the urban areas are expanding significantly towards its fringe areas and the more and more peripheral area of villages accommodates rapidly over a period which leads to the issues of urban communities regarding the haphazard physical development and infrastructure services which finally leads to the decrease in quality of life. The "Urban Villages" gradually shift towards area under stress due to the remarkable growth of population, built structures and increasing demand for the land. Better management perceived at an institutional level. It is critical to study the appropriate method of planning and management to solve the problems which can lead these villages to have a better quality of life. The next section is the critical review of the literature studied in various subsections followed by the conclusions drawn from the survey.

II. CRITICAL LITERATURE REVIEW

Following literature are thoroughly referred relating to the peri-urbanization, land use planning, rural spatial planning, peri-urban morphology, sustainable planning of peri-urban areas, its dynamics and typology. Hence, the literature divided into several topics.

A. Peri – Urbanization

It can be described as the land interface between the city and village, or also as a transition zone of urban and rural where the urban and rural uses mixes and often spar.

Peri-urban development has been a complex phenomenon, characterized by the transformation of landscapes formed previously by rural life into the city [2]. The conversion changes in the way people use their environment, consequently to the spatial structure of the landscape, rapid population growth and migration [2].

Peri-urbanization defined as the process in which the rural or the village area becomes urbaner regarding physical, economical and social aspects.

Straka Jakub et al. (2016) illustrated various criteria to measure the rural development such as social, economic, cultural or environmental in the Czech Republic. The two primary deficits eliminated in this paper are first which factors and indicators to be selected and secondly what level of the region is appropriate for rural development assessing. Here 307 articles were chosen and then finally only 21 have been selected, out of which ten articles are such which focuses on the Czech Republic, and other 11 focused on European countries. All these 21 articles studied in depth, and the different factors of rural development identified. They found out different local, demographic, economic, social and cultural factors of rural development but theses alone cannot determine the rural development as the approach is very comprehensive in nature. Also, it suggests that use both objective and subjective data in the process of examining rural development. Finally, on studying the

European countries and the Czech Republic, the researcher has identified 14 indicators [3].

Dinesh Singh et al. (2015) carried out a study in the peri-urban area of Indore Indore city located in Madhya Pradesh state. As Urbanization increases, the fringe's productive agricultural land gets converted to urban uses. Also in villages, there is a lack of proper guidelines and monitoring system so the conflict of development goes on and hence unorganized growth takes place. The findings of the paper suggest that there is no development plan for the region and nor the authority is following the guidelines. The outcome of the study suggests that the agricultural land wasted upon in random development. Few recommendations by the researcher are given to have a planned framework for the peri-urban villages [4].

Lai Yani et al. (2014) pinpointed the constraints in land development in urban villages of China considering two cases in Shenzhen. This study provides a perspective from property rights to understand the development of urban communities, with particular attention to industrial land development. This approach develops a conceptual framework to understand the role of land property rights in land development. A set of research questions prepared and comparative analysis was conducted based on two cases in Shenzhen, one Dongfang-tantou industrial area, and another Bagualing Industrial area. After the comparative perspective, it is noted that the Dongfang-tantou area has suffered from a lack of infrastructure, the road system is weak, and lack of other facilities makes it a less competitive area as compared to Bagualing area. Thus there is a demand to upgrade the Dongfang-tantou area to fetch safe investments and enterprise. The reasons for such lagging behind performance are because of land exploration risk, and the standard property transaction is forbidden and not covered in by the state land management system. Therefore, more efficient and equitable land reforms are to be incorporated, and property right needs formalization over common areas in urban villages in China [5].

Pengjun Zhao (2013) analyzed the new trends in the peri-urban area after 2000 in China using the empirical analysis method. The reasons identified are Dynamics of peri-urban, population growth change in land use and social inequalities peri-urban villages have resulted in congestion. The planning responses towards urban-rural integration are village communitywise management and redevelopment of urban villages. The innovations include arrangements of power, public resources, rights and legitimacy in the planning system [6].

Goel Neha (2011) studied about the urban fringe of Faridabad city of India, where the random development has taken place in the form of Ribbon Development all along the transport corridors and lack of infrastructure facilities and shelter. This kind of churning growth has led to unmanaged land development. Here the authority has planned the area but the agency working actually on the field doesn't seem to follow planning norms, and eventually, it will lead to loss of visual quality of space. So every sector is growing in isolation without integrating the growth with other nearby centers, and thus mixed land use is practiced which will lead to the haphazard development and unorganized infrastructural facilities result in depletion of natural resources. Thus concluding this paper, the outcome is that as planners it is the prime duty to plan these most neglected areas to have integrated development [7].

Hao Pu et al. (2011) critically explored that the urban villages in Shenzhen face a problem of neglected planning by the policymakers and later face the aggressive demolition – redevelopment programs to replace them with the formal neighborhoods. The development and re-development programs are explored by the researcher in this paper. They collected data from three fieldworks in 2006, 2008 and 2009 where 46 villages of six districts observed. Also, interviews with 15 leaders of urban villages were taken. They also identified characteristics of urban communities such as physical characteristics, political system, economic activities and socio-economic aspects. Thus there is a need to have balanced, integrated perspective on urban development which considers the two important aspects of sustainability, social equity, and environment as well as economic growth [8].

Rauws W. S. et al. (2011) highlighted the concept of transition between the urban and rural areas and thus take into account the peri-urban areas, drawing on four case studies in European urban regions. The motto behind this paper is to explore the mechanism behind the non-linear and discontinuous nature of spatial developments in the peri-urban areas. To identify the characteristics of transitional change the city regions of The Hague, Leipzig, Montpellier and Warsaw were selected. The methodology included interviews of 10-14 experts and then analyzing each. Studying all the four regions, two important conclusions drawn are: one is predictability of peri-urban development paths, and other is about mechanisms managing the peri-urban change. The suburban transitions are driven more by push and pull factors and that these drivers are partly path dependent and emerge from contextual changes. A more adaptive approach to planning is necessary [9].

Halkatti Meera et al. (2003) observed the factors that enhance or hinder the process of Participatory Action Planning Project (PAPP) in five peri-urban villages of Hubli-Dharwad twin city region of India. For selecting the village, few features like proximity to the city, the degree of influence by the city, rural values and character, industrial development, commercialization and so on considered. The selected villages are Mungad, Channapur, Gabbur, Kotur and Kel Geri. Under PAPP, tools used were rapport building with the community, meeting with stakeholders, Participatory rural appraisal (PRA) exercise, iterative planning, working groups were to create an action plan together, field visits and workshops. Problems and issues identified and major learning extracted about the government interaction and the implication of peri-urban characteristics on planning and community mobilization [10].

Joe Ravetz et al. (2013) elaborated in this chapter about peri-urbanization and its effect in global and European context. The nature of peri-urban, theoretically, its geographic definitions and related Metropolis and Megalopolis along with dynamics of peri-urban regarding physical, socio-economic and political manner. Also, a

framework for understanding different levels of change in the peri-urban system mentioned. Methods and results about European studies and trends discussed along with implications and conclusions. The peri-urban area is not well defined as a result of transitions and different driving forces at various scales. Also to get into the deep study of peri-urban area i.e. models and tools do not exist, and one needs to find a solution to it [11].

German Adell (2007) examined the various theories and models of Peri-Urban Interface (PUI) and accordingly Growth Pole Theory, Urban Bias Critique and Secondary Cities and Urban Diffusion Theory with its implications and values assessed. These old concepts are modernized by new theoretical elements such as Urban-Rural Linkages and Flows, The Expanding City, Globalization and Extended Metropolitan Regions, The Desakota Model, The Networked Model and The Territoriality of the Rural-Urban Interaction. From the three case studies here of Bangkok, Jakarta, and Southeastern Coastal of China the theories explained well. Nevertheless, it may be advantageously balanced, if not replaced, by more recent thoughts regarding research or policy-making conditions, as long as the final coherence of the discourse is assured by internal rules as well as an adequate challenge from real-world situations [12].

B. Peri – Urban Morphology

Cobbinah et al. (2015) showed how indigenes of Feyiase, a peri-urban area of Kumasi, Ghana, area adapted to the effects of fast growing transformation of the peri-urban agriculture land into residential and other uses. The methods adopted include interviews, household surveys and agency consultations. The main aim of the paper is to analyze the nature and extent of physical development, its effect on peri-urban livelihood and the coping strategies of peri-urban indigenes. From the findings, it can be noted that the resident has come up with main three coping strategies. They are: changing primary livelihood source, migration and dependence on remittances [13].

Amoateng Paul et al. (2013) observed the nature and extent of physical development in peri-urban areas of Abuakwa in Kumasi, Ghana and to identify the factors contributing such rapid and scramble growth which has altered the peri-urban morphology. The primary and secondary data acquired from the government institutions of Kumasi Metropolitan Assembly (KMA) and Atwima Nwabiagya District Assembly (ANDA) along with an interview from the village dwellers. The data collected were analyzed using SPSS and then validated also. The existing land use was examined, and then the new land use was proposed for residential, commercial, industrial, open space, education, civic and culture, sanitation and circulation. Due to an interaction between such factors, the ill effects are a loss of agricultural land, lack of access to utilities, unregulated conversion of land, chances of flooding, poor internal circulation and traffic congestion. Thus, it recommends strengthened planning institutions with adequate planning actions to promote orderly physical development in urban fringes and create livable peri-urban areas [14].

Peri – Urban Typology

Budiyantini Yanti et al. (2016) identifies various typologies of peri-urban areas in the Metropolitan Bandung of Indonesia by 17 cluster analysis of 255 villages and 18 variables, based on physical, social and economic characteristics. The three types identified are Predominantly Urban, Semi-Urban, and Potential Urban. Thus it can be noted that the mostly urban areas are located quite nearer to the core Bandung area while the Semi-urban located in between and the potential urban is far away from the core. The closer the region near to Bandung is likely to have more urban nature while the once located far away explained as the leapfrog process of sprawl [2].

Iaquinta David et al. (2000) proposed a definition of peri-urban (PU) and elaborated on a conceptual peri-urban typology, comprising its relationships to rural and urban forms. Primarily, it identifies five peri-urban types: village PU, diffuse PU, chain PU, in-place PU and absorbed PU. The typology derives from underlying socio-demographic processes, especially migration. The new definition helps to identify the institutional framework and relevant networks in the different peri-urban areas. As an example, the institutional framework is applied to the areas of land tenure/inheritance rules, and to population aging. The article finishes with the identification of some of the unresolved issues and constraints [15].

C. Rural Spatial Planning

Tietjen Anne et al. (2016) explained about an emerging strategic planning approach at the local level by using the concept of wicked problems, Actor – Network Theory and strategic planning approach. The case study of Thisted rural municipality is discussed here in relation with the rural shrinkage. The primary purpose of this paper is to provide a solution to this wicked problem through strategic planning approach both empirically and theoretically. The theoretical approach is composed of three components, firstly shifting from wicked problems to a communicative rationality, secondly placed based and learning oriented strategic planning and lastly strategic planning as a translation process. So to create a better quality of life to the village people, the framework was set up for settlement and tourism. The outcome of the study shows the real role of planners, the effect of collaborative decision making and also the local physical projects played a significant role in sustainable adoption to rural shrinkage [16].

Poerwoningsih Dina et al. (2016) presented the results of research using the visibility analysis in the countryside Bumiaji, Batu, where the characteristics of the rural mountains feared to change. The research aimed at villages with the criteria of the major issues that are assumed to carry an adverse change to the development of rural areas. These problems are Urbanization, Land use, Environmental degradation and the threat of water and energy crisis, Low economic level, and Areas include in Indonesian economic corridors in MP3EI. This paper organized into two main sections. The first section describes the function of the visibility and analysis capabilities. The second part presents the methods and results of the implementation of the profile analysis and its implications on rural area spatial planning in the study area. Such kind of analysis can be used to facilitate stakeholder in better understanding the complexity of rural

space in the stage of rural resource information inventory and also in the stage of further planning analysis [17].

Scott A. J. et al. (2013) identified the scope, nature, and reasons behind the disintegrated development of Rural-Urban Fringe. Particular attention is given to the ecosystem approach and spatial planning framework which reflects the naturally built environment. Three bridging concepts were identified as time, connections and values. The study is carried out in two cities i.e. Hampton and North Worcestershire. The methodology adopted included interviews, workshops, and Rufopoly. The outcome of the research provides a conceptual bridge to enable spatial planners to Victor further crossings that are essential for planning's future development and success [18].

D. Land Use Planning in Peri – Urban Areas

Peri – urban area: The Organization for Economic Co-operation and Development (OECD) in its report on peri-urban agriculture states as follows: "The term peri-urban area cannot be easily defined or delimited through unambiguous criteria. It is a name given to the gray area which is not completely urban nor essentially rural in the usual sense; it is at most the partially urbanized rural area. Whatever definition may be given to it, it cannot eliminate some degree of arbitrariness [1]."

Peri – Village area: The land surrounding the gamtal of a village within the administrative boundary shall be termed as a peri-village area.

K. Malarvizhi et al. (2016) prepared the land-use map using the free Google Earth images instead of downloading the expensive images which may not be accessible at all times due to security reasons. So here the researcher uses Google images, then mosaic and clipped to facilitate on-screen digitizing GIS software. These pictures were used to detect the urban change by utilizing the images of 2007 and 2014. This study was carried out for Vellore in Tamilnadu where a tremendous urban growth has been experienced in recent decades. The methodology adopted is very simple starting from collecting the topo sheets from Survey of India then scanned and geo-referenced using GCPs, the boundary of Vellore is then converted from ArcGIS shapefile format to Google Earth compatible format, the Google Earth images extracted by using Elshayal Smart. Total 340 images were collected and digitized using UTM projection in ArcGIS 10. Finally, onscreen scanning of various land use classes was performed to prepare land use map [19].

McFarland Paul et al. (2015) concluded that the peri-urban areas require a more mature approach to land use planning taking the case studies of Melbourne and Sydney, Australia. The researcher has identified a tangle of law, science, and economics in the current approach to planning peri-urban areas. The consumption of non-urban land continues for public use in spite of many attempts, it cannot be stopped, but the pace reduces. Considering all the facts, the consumption of peri-urban land must be controlled and well organized in a balance land use planning [20].

Zivanovic-Miljkovic Jelena et al. (2012) studied the problem of land-use planning in the peri-urban zones of Serbia which call for sustainable development, where employment opportunities created at the cost of natural resources. The main issue here is the overlapping of different land uses as a result of competing interests. After analyzing the situation in Serbia, it was found necessary to re-establish a relationship between the agriculture and urban, spatial and economic dynamics. Individual more recommendations were given considering the farming and agricultural land and the greenery [21].

Lestrelin Guillaume et al. (2011) compared the situation before and after the changes made by the government of Lao in the Land Use Planning and Land Allocation program (LUPLA) to measure the level of participation in the planning of village land-use. The two principal questions 1) to what extent has the evolution of Village Land Use Planning (LUP) approaches resulted in increased local participation? And 2) to what extent does it influence the livelihood and land uses? To answer these questions, six villages namely, Soptia, Phadeng, Paklao, Nambo, Phakhok and Phnoukhong were selected as research sites. The simple quantitative approach was adopted, and four key indicators were derived from the sample questionnaire survey of 15-30 individuals in each study village. The indicators are presence, voice, the level of understanding and overall participation level. By using correlation coefficient matrix, it was found that there is a small influence of LUPLA on the livelihoods and land use patterns. Limited local participation in decision making and non-elites remain largely excluded from the planning process. They consider LUP just as a means to delineate the village boundary and allocation land to village households. Later on, Participatory Land Use Planning which addresses the matter was also found having limited influence on participation [22].

Shabane Ikopoleng et al. (2011) discussed the case of Botswana, in context to South Africa, where problems of squatters in the peri-urban area were solved by regularization of individual residential plots after paying a monetary fine. To evaluate the impact of this regularization is the main aim of the paper. The data were collected from the interview, mapping of peri-urban areas using ArcGIS and observations from the field work. The major impacts are the need to adjust the plan and difficulty in implementing the customized plans, unfair and unequal land distribution and finally views and preferences of the villagers. Out of the three alternatives proposed since 1992 i.e. regularization, litigation and eviction, the regularization of plots paying the penalty were found to be the most appropriate solution [23].

Hessel Rudi et al. (2009) explored the linkage between the participatory and GIS-based Land use planning at village level involving local as well as development workers in the approach. The main aim of the paper is to describe the method used for the village workshop and to evaluate the added value of the use of GIS for the same. For this research three villages in southeastern Burkina Faso situated in Gourma province in Africa. The method adopted is based on the socio-economic and gender analysis approach (SEAGA) in two phases: (i) diagnosis and (ii) participatory land use planning. From the results obtained it can be noted that the local people are aware of the driving forces behind the soil degradation, and they do take actions to resolve it but have concrete ideas to resolve it. The use of GIS proved its importance in integrating the land use planning. The maps

produced facilitate discussions among community members, researchers and government officers at the regional level, both regarding the current land use and the alternative option given by the local people [24].

Nidumolu U. et al. (2006) reviewed the Integrated Mission for Sustainable Development (IMSD) land use planning procedure through soft system methodology (SSM) and discusses ways in which this and similar land use planning programmes can be more useful for adoption by farmers, conservation of soil and water resources and impact on poverty alleviation in rural areas. The review has been carried out over seven stages, starting from the problem situation to the root definition of a conceptual model to comparison of the real world with the theoretical model and finally action to solve the problem. Many practical approaches of SSM are explained, and individual studies are prepared as separate publications. Concluding the paper, the current approach is seen to have more of biophysical components with low priority to socio-economic factors and thus to increase the acceptance of plans by local people, it is necessary to include the social and economic factors wherein all stakeholders participate in making the plan is required [25].

III. Summary and Conclusion

Based on the Literature review the following conclusions are drawn:

1. The only way to control these activities is to ensure planned development through the involvement of all the stakeholders starting from the villagers to the development Authority of the district.
2. A well balanced land-use plan must be prepared for each village to regularize the random development and consumption of peri-urban land.
3. The change of agricultural land into urban use must be controlled.
4. The potential villages must be identified, and works of development shall begin soon to upgrade and fetch good investments
5. Need for a conceptual bridge to enable spatial planners to Victor further crossings those are necessary for planning future development.
6. There is a need to have balanced, integrated perspective on urban development which considers the two important aspects of sustainability, social equity, and environment as well as economic growth.

Thus, it recommends active planning institutions with adequate planning actions to promote orderly physical development in peri-urban areas and to create a high quality of life for the dwellers. Also, being a planner, it is the prime duty to plan these most neglected areas to have integrated development.

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