Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

THE GREEN BELT OF BANGALORE: PLANNING AND THE SOCIO-ECONOMIC CONTEXT

Meghana ESWAR
School of Research Methodology, Tata Institute of Social Sciences, Mumbai, India
meghana.eswar@gmail.com

Abstract
The green belt concept of planning that is intrinsically linked to designing urban spaces, has transformed over the years following global debates on its ineffectiveness. Such a critical examination is lacking in the Indian context, where neither peri-urban land use studies nor planning studies have given it significant attention. This research 1) traces the idea of the green belt in Bangalore and related flexibility measures 2) examines existing land use in the green belt of south Bangalore and 3) captures the role of changing socio-economic context and farmers perception in shaping these spaces. To do so, the study examines plan documents of Bangalore to identify the changing concept of the green belt; and captures the socio-economic aspects from field conversations with government officials, farmers, and other residents of the green belt. The study region depicts only certain conforming and large-scale non-conforming land use practices; rendering the green belt ineffective in curtailing urban growth as well as in sustaining agriculture. The study argues that planning needs to factor in the socio-economic context and to ensure fair development practices flexibility measures need to be accompanied by institutional changes that move towards a more local and dialogical approach. It contributes to a latent Indian debate but a larger global debate on the objectives and beneficiaries of a green belt.
Keywords: green belt; urban planning; Bangalore; peri-urban agriculture; land use changes.

1. INTRODUCTION

The recent report by London & Partners declared Bangalore[1] as the fastest-growing tech-hub since 2016, followed by London ("Bengaluru World's Fastest-Growing" 2021). Its Chief Representative of India is quoted as "Our two great cities share mutual strengths in entrepreneurship and innovation – creating lots of opportunities for tech investors and companies to do business across both regions." ("Bengaluru World's Fastest-Growing" 2021). But Bangalore and London have more in common than just being Silicon Valleys; such as the green belt concept that shapes the peri-urban landscape of these two cities.

The concept of a green belt originated in Britain during the early 1900s, specifically to contain urban growth and to provide recreational spaces for urban workers (Bishop et al., 2020; Munton, 1983). This idea was propagated by Abercrombie[2] post-second world war and between 1950 and 1970 other

[1] Officially known as Bengaluru since 2014.
[2] Abercrombie was one of the key British planners who was influenced by Ebenezer Howards' Garden City concept (Heitzman, 2004).

nations such as Japan, Australia, and New Zealand adopted this concept (Amati, 2008). But the purpose of the green belt has been increasingly questioned in Britain, due to the emergence of non-conforming residential and commercial land uses; and negligence of conforming agricultural land uses (Bishop et al., 2020; Bryant et al., 1982; Munton, 1983). Likewise, other nations[3] have also reviewed this concept and have either abandoned it during the initial phase (Japan and Korea till 1970), or deregulated it with neo-liberal adoption in 1990 (Australia), or have taken to new forms of 'green spaces'[4] (Amati, 2008; Bishop et al., 2020). Concerns are also raised about the implications of such measures on the general survival strategies of farmers such as the sale of land (Robbins, 2012). However, there is no direct reference to the green belt concept in Indian studies, and to examine the Indian experience one needs to understand the larger context of planning including its institutions and debates around it.

India being a colonised nation, was influenced by the British idea of planning cities for 'orderly growth' by the late 1800s itself. The Bombay Town Planning Act of 1915 was the first legislation on land use regulation in India, enacted in response to the plague of 1896 (Spodek, 2013). Post-independence (1945) many states institutionalised planning by implementing legislations and constituting town planning departments (Spodek, 2013). Karnataka institutionalised planning with the Karnataka Town and Country Planning Act enacted in 1961. This resulted in the creation of planning authorities that were entitled to prepare master plans for local planning areas (LPAs). These planning areas usually extend into the peripheries of a city. In India, only 32% of urban agglomerations (UAs) have a master plan, while in Karnataka 27% of UAs have a master plan (Nair, 2007).

Though it is widely accepted that planning in India has origins in pre-independence British laws (Dossal, 2005; Menon, 1997; Nallathiga, 2009; Spodek, 2013), only certain ideas such as the green belt were borrowed. Neither its discretionary nature nor its institutional setup reflects in the Indian planning system. Britain started with a discretionary system in the 1940s (which allows development that may not align with the plan documents) and moved to a positive regulatory mechanism by 1991 (Booth, 1995; Grant, 1992). It remains a highly centralised system (Grant, 1992) even though local administration prepares detailed local plans by following structure plans (i.e. strategic policy documents) prepared by regional offices (Booth, 1995; Grant, 1992). These plans however have a weak legal obligation (Grant, 1992). India on the other hand, adopted a regulatory system of planning which requires one to adhere to the plan

[3] Sweden did not adopt the green belt concept popular during the 1930s, due to differences in perception of leisure (Qviström, 2010). The British concept of the green belt was associated with leisure, but leisure in Sweden was associated with nature such as forest and coast. Agriculture landscapes around cities were not perceived as leisure spaces, and hence the green belt concept seemed unsuitable for Sweden (Qviström, 2010).
[4] Such as protected parklands at the edge of a city and buffer zones (Bishop et al., 2020).

Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

documents; and has legal obligations. Its institutions of planning have largely remained central/regional, despite legislations that require planning to be done at the local level.

Such a regulatory system that has legal connotations, has increased focus on deviations from planning. Deviations are reported in cities of Bangalore (Nair, 2007; Sudarshan, 2011; Sundaresan, 2019), Delhi (Chatterjee, 1984; Tewari, 2011), Vasai-Virar in Mumbai (Kewalramani, 2011), Jaipur (Sharma & Mishra, 2011), and Durgapur in West Bengal (Jagannathan, 1987). Such deviations are generally used as an indicator of the effectiveness of planning, and hence there persists a notion that planning is largely ineffective. Certain government bodies such as the ministry of urban development (Mahendra et al., 2010) and the 11th five-year plan (volume III, p. 396 as in Rout 2017) have also raised similar concerns in planning.

But deviations are in fact manifestations of a regulatory planning system, a system that rests on the premise that development is predictable and hence land uses can be determined in advance. Regulatory planning thus becomes un-accommodative of any deviations in land use that may arise due to change in contextual factors such as infrastructure development (Ravindra, 1996), change in nature of economy (Ravindra, 1996), development of neighbouring cities (Brook & Davila, 2000), adoption of technology, and introduction of new laws (Sharma & Mishra, 2011). It also fails to recognise the informality of livelihoods and settlements that are associated with urban growth (Roy, 2005, Sharma & Mishra, 2011, Jagannathan, 1987), including the informality of settlements associated with the middle and rich class (Roy, 2005), usually referred to as 'revenue layouts'[5] (Pellissery et al., 2016).

Arguments are thus made for a more accommodating planning system that recognises deviations or informalities (Jagannathan, 1987; Roy, 2005). The Delhi master plan, for instance, recognises spaces with unclear property titles as 'urban villages', and these spaces are not subject to any building regulation or land use regulation (Narayanan & Véron, 2018). In Karnataka, amendments to the existing Act (Sundaresan, 2019) and other legislation on 'regularisation' frequently resort to 'legalising' unauthorised settlements (Pellissery et al., 2016); have enabled dilution of adherence to planning. Such a recourse by the government, are in fact flexibility measures (Booth, 1995) undertaken to accommodate deviations. More such measures, be it amendments or changes in planning tools, need to be identified and debated by examining plan documents; an aspect that has received little attention in India (Krishnankutty, 2018).

There also exists a clear disconnect in studies that examine planning, and those that examine land use and livelihoods in the peripheries. While most of the deviations mentioned in planning literature manifest in the peripheries of a city, specifically that of 'revenue layouts' (Pellissery et al., 2016; Roy, 2005), studies

[5] This refers to housing formed on agricultural land that does not have legal sanction for such conversion.

that examine land use in the peripheries do not refer to the influence of land regulation. Land use studies rather depict land use as a function of distance from the city centre (Gowda et al., 2012; Patil et al., 2018; World Bank, 2013) attributing any irregularities to factors such as - transport available and time taken to travel, presence of other large towns and defence establishments, presence of natural barriers such as a river (Halkatti et al., 2003; Lal, 1987; Rao & Tewari, 1979; Simon et al., 2004; Sinha, 1980).

Likewise, on the aspect of livelihoods, concerns are expressed on the implications of planning on the marginalised (Narayanan & Véron, 2018; Roy, 2005, 2009; Sridhar, 2010), but few (see Jagannathan, 1987) refer to its implication on agriculture practices in the peripheries. The few studies that link land use regulation to agriculture practices perceive planning as a tool to boost agriculture – either in the form of earmarking spaces for agro-business (Patil et al., 2018) or in the declaration of green belt to help retain agriculture practices (World Bank, 2013). The green belt of Bangalore as referred to in the World Bank Report (2013) pg 44:

Green areas comprise protected land zones, restricted development areas, and agricultural zones. This is another indication of the awareness of the city towards its agriculture sector.

This perception of a green belt as spaces that sustain agriculture practices is completely contrary to debates on the ineffectiveness of planning. A critical examination of planning measures such as the green belt is thus required for the Indian context; one that cuts across themes of planning, land use, and livelihoods. Few studies do so in the context of Britain (see Bryant et al., 1982; Munton, 1983), but in India, the green belt just finds mention in the panel discussion on Delhi's master plan, where it is seen as spaces that serve an ecological purpose and also as spaces for future urban growth (Chatterjee, 1984).

This study thus attempts to bridge the gap in understanding land regulations and their impact on land use and livelihoods in the peripheries, by taking the case of Bangalore. The city spans across 700 sq km with about one crore population, and its urban agglomeration witnessed high exponential growth rates of 3.22 and 4.02 between 1991-2001 and 2001-2011 respectively (Eswar & Roy, 2018). Such an expansion has significant implications on the land use and livelihoods of people living in its peripheries. This pressure of urbanisation acts alongside land regulatory measures such as the green belt, resulting in peculiar peri-urban dynamics. Hence, this study 1) traces the idea of the green belt in Bangalore and related flexibility measures 2) examines existing land use in the green belt of south Bangalore, and 3) captures the role of changing socio-economic context and farmers perception in shaping these spaces.

Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

2. MATERIAL AND METHODS

Secondary literature, plan documents and interviews, were the main sources of information collected between September 2019 – March 2020, to understand the emergence of the green belt and its implications on the peripheries. Secondary literature on the growth and planning of Bangalore by Nair (2007), Sudarshan (2011), Ravindra (1996), and Heitzman (2004) provided information on planning authorities, plan documents, and related legislation. Plan documents of Bangalore for the years 1972, 1984, 1995, 2007, and 2031[6] were obtained from a library, the planning department, and from the internet. All these documents were analysed for changing concerns and concepts of the green belt; to identify flexibility measures introduced over the years.

Villages to the south of Bangalore and in particular one village with a major portion of its land under the green belt was examined for resource change and livelihoods. The region which was predominantly dry land has witnessed a decline in agriculture with persistent dairy practices and vast areas under plantations. Simultaneously, non-agriculture occupations and migrants have increased after industries were established in the vicinity since 1990. Interviews of planning and local governing officials, as well as residents such as farmers, real estate agents, and other key informants, captured the changing land use, livelihoods, and perceptions of the green belt. The following analysis presents the changing concept of the green belt, the nature of land use in the peripheries, and how socio-economic context and farmers' perception influence these practices.

3. EMERGENCE AND SUBSEQUENT FLEXIBILITY OF THE GREEN BELT

The global city of Bangalore, otherwise referred to as the Silicon Valley of India, was also known as the 'garden city'. The name 'garden city' originates from 'garden spaces' that were located within the city that supplied fruits and vegetables to its residents (Nair, 2007). The Bangalore Development Committee (BDC) had identified 17.15 sq km (out of 66.2 sq km of city corporation area) of such green spaces[7] in its 1952 report (Nair, 2007). While the BDC had also referred to a green belt around the city (Heitzman, 2004), it was only after the enactment of The Karnataka Town and Country Planning (KTCP) Act of 1961, that a 'green belt around a city' materialised. The 1972 plan (Refer Table 1) reports a green belt spanning 11.90 sq km (2.38%) of the planning area (500 sq km). In 1984, due to increased urban growth in the previous decade and concerns about developments in the peripheries, the planning authorities

[6] The latest RMP 2031 received provisional approval on 22-11-2017 but was withdrawn in July 2020 ("Govt Withdraws Provisional Approval" 2020). Yet, it is included in the analysis as it provides significant insight into perceptions of the green belt and land use changes of Bangalore.
[7] Over time, there was infilling and these garden spaces got converted to urban spaces (Nair, 2007).

substantially increased the planning area of Bangalore from 500 sq km to 1279 sq km spanning 543 villages. Accordingly, the green belt area was increased to 839.72 sq km (65.65%), assuming that an expanded green belt will result in better climatic conditions for Bangalore. It also provided for large scale tree plantation and recreational spaces in the green belt. The study village too was declared as a green belt during this period.

TABLE 1 - GREEN BELT AREA AND CHANGING STRATEGIES SINCE 1972

Plans	ODP 1972	CDP 1984	RCDP 1995	RMP 2007	RMP 2031
Approved Date	22-5-1972	12-10-1984	5-1-1995	25.6.2007	Withdrawn
Plan Period	1961-1976	(1984) - 2001	2011	(2005) - 2015	2031
Land Use Survey (Year)	1961, 1972	1983	1990	2003	2015
Plan Area	500 sq km 166 villages	1279 sq km 543 villages	1279 sq km	1219.50 sq km	1206.97 sq km 538 villages
Green Belt	11.90 sq kms (2.38%)		(714.35 sq kms) (55.85%)	649.24 sq kms.* (49.67%)	300.95 sq kms. (24.93%)
Proposed Green Belt	10.54 sq kms. (2.11%)	839.72 sq kms (65.65%)	682 sq kms. (53.32%)	419.50 sq kms.# (34.40%)	322.66 sq kms. (26.73%)
Plan Strategy (Towards Deregulation)	Shift industries outside city. Retain cultivation, afforestation inside city.	More green belt for better climate.	Spotted development in green belt.	Structured continuity – open north-west to south-east of green belt; inner area renewal.	Differential scenario – decongest core with periphery growth and open green belt.
Zonal regulations in green belt (other than agriculture use)	Expansion of gramthana – 100 mtrs for population < 1000 and 200 mtrs for population > 1000.	Special permission for: parks and other public and semi-public recreational spaces not conducted for profit.	Special permission for: worship, school, hospital, sports, club, 100 mtrs of gramthana area (G+1).	Burial grounds, education and health institutions, sports grounds, water and solid waste plants, golf course. 250 mtrs of gramthana area.	Stadiums, Religious, Education and Health Facilities, EWS housing, waste management plants, solar; 250 mtrs of gramthana. Special permission – government land, brick kiln, golf course, truck terminals.

Source: Various plan documents of Bangalore
Note: * includes BMICAPA; # excludes BMICAPA (Area under BMIC Planning Authority)

However, since 1995, flexibility measures such as deregulating the green belt and relaxing its zonal regulations have been increasingly adopted to accommodate the auxiliary needs of an expanding city. The initial deregulation in 1995 allowed spotted development around four industrial areas - Electronic City, White Field, Mysore Road (Kumbalgud), and Old Madras Road (Bhattarahalli, Avalahalli). This was

Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

a 'correction' to the misclassification of the green belt in 1984 when already existing developments such as these industrial areas were categorised under the green belt. By 1997, non-conforming land uses including 336 layouts, 13 resorts, and 42 crushers were reported in the green belt[8] (Nair, 2007). Hence, subsequent plans further deregulated the green belt. The 2007 plan following a structured continuity approach, suggested opening up the north-west to the south-east (clockwise) part of the green belt but to retain the west and south under the green zone as these were water-rich areas. The 2031 plan was also in favour of more development in the green belt.

In addition to deregulation, zonal regulations in the green belt were also relaxed (Refer Table 1). This relaxation facilitated different forms of urban growth around the gramthana[9] and on agricultural land. In the 1972 plan, only certain areas around gramthanas - 100 mtr for a population less than 1000 and 200 mtr for a population more than 1000 - were permitted to develop while the 'rural tract' was to retain cultivation of fruits, vegetables, and afforestation. The radius was however increased to 250 mtr in the 2007 plan, which remains the same even to this day.

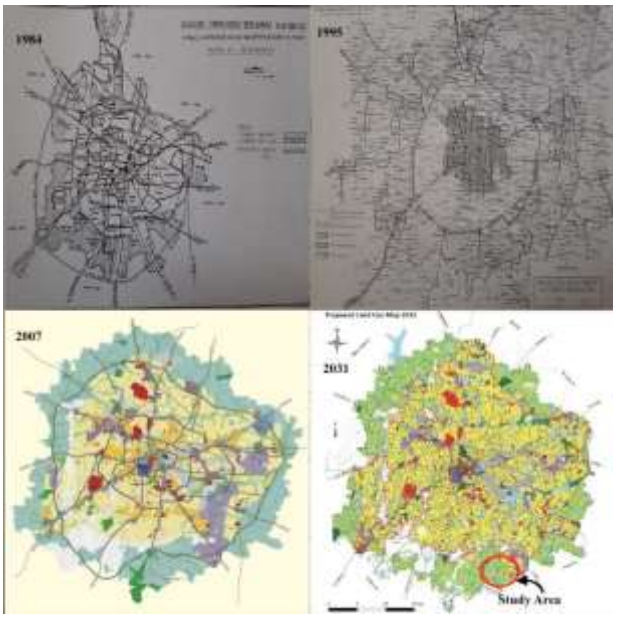

FIGURE 1- PROPOSED GREEN BELT IN VARIOUS PLANS OF BANGALORE
Note: Plans of 1984 (top left), 1995 (top right), 2007 (bottom left), 2031 (bottom right) depicting proposed green belt areas (these are obscured in early plan documents). These have now given way to accommodate the auxiliary needs of an expanding city. Study area encircled in the 2031 plan – bottom right.

Other than increasing buffer zones around the gramthana, urban developments were also permitted in the green belt. In 1984, special permission was required to develop parks, public spaces, and recreational

[8] Out of 392 villages in the green belt, 120 remained free from real estate development in 1997 (Nair, 2007).
[9] Village land is broadly categorised as a settlement area and agricultural land. *Gramthana* refers to the area where settlements (houses) are present, and revenue land refers to all other lands where agriculture is practiced.

spaces only for 'non-profit'. By 1995, the plan allowed more developments under special permission such as places of worship, school, hospitals, and sports clubs. The non-profit clause was entirely removed. In 2007, special permission was no longer required for schools, hospitals, etc. Additional land uses such as burial grounds, water treatment plants, solid waste management units, and golf courses were permitted. In RMP 2031, the special permission clause was reintroduced only for developments that were allotted government land, and for golf courses, brick kilns, and truck terminals. Additional uses such as EWS (economically weaker section) housing, solar parks, and stadiums were permitted. The green belt thus increasingly opened up to spaces that largely cater to the urban population - recreational spaces, schools and hospitals, sports centres and golf courses, waste treatment plants, and energy plants.

A shift in the objective of green belts, from providing food for the city to providing 'environmental service' to the city, and finally as a space to accommodate associated urban developments, has resulted in the reduction of area under the green belt. Ever since its expanded declaration in 1984, subsequent plans have always proposed a smaller green belt than that existing (Refer Table 1 and Figure 1) – partly as a response to unauthorised development and also to facilitate more growth. The green belt area has thus consistently reduced to 714.35 sq km (55.85%) in 1990, to 649.24 sq km (49.67%) in 2003, and 300.95 sq km (24.93%) in 2015.

4. IMPLICATIONS OF PLANNING ON LAND USE IN THE STUDY REGION

The declaration of a green belt in 1984, brought the study region under the jurisdiction of the Bangalore planning authority i.e. the BDA (Bangalore Development Authority). Its land was subject to regulation, which restricted the emergence of urban forms. This region nevertheless remained largely agricultural until 2000, after which urban land uses emerged when software industries were located in Electronic City towards the south of Bangalore. The relaxation of zonal regulations post-1995, combined with a change of land zones near the study region in 2007, facilitated urban-oriented land use; the case of six villages depicted in Table 2.

Contrary to the notion of the ineffectiveness of planning, land use in the study region shows that planning is influential in facilitating certain forms of development – be it in the developable zone or in the green belt. Villages that fall under the developable zone (village A, B, and part of village C) depict more development than those declared as a green belt (Village D, E, and F). In particular, approved (or authorised) residential spaces such as layouts formed by the government and apartments built by private builders, are present only in areas earmarked for growth (Refer Table 2). The main study village, which has its gramthana and a major part of its revenue land under the green zone, also depicts a similar influence (Refer Figure 2). Only the small part of its revenue land (closer to industrial areas) and the 250

Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

mtr of gramthana buffer zone that are 'legally' allowed to develop have three apartments (established in 2009) and four layouts respectively.

TABLE 2 - LAND ZONE AND LAND DEVELOPMENTS IN SIX VILLAGES

	Village A	Village B	Village C (Study Village)	Village D	Village E	Village F
Planning Authority*	BDA	APA$	BDA	BDA	BDA	BDA
Proposed Land Use for 2015*	High Tech (Industrial) with little residential		Agriculture with very little residential	Agriculture	Agriculture	Agriculture
Existing Land Use in 2015*	Vacant Spaces with some residential, agriculture spaces		Mainly Agriculture with little industrial, public/semi-public spaces	Mainly Agriculture with little industrial, public/semi-public spaces	Mainly Agriculture	Mainly Agriculture
Proposed Land Use for 2031*	Residential	Residential	Agriculture with little residential, industrial	Agriculture	Agriculture	Agriculture
Major Educational Institutes**	1	2	4	2	-	-
Approved Layouts/Apartments (2019)***	11 (Apartments)	4 (Govt Layouts)	3 (Apartments)	-	-	-
Local Sites#	No Data	No Data	42	7 to 8	No Data	No Data
2019_Price of Agriculture Land per acre (in lakhs) * **	112	73	95	85	88	64
Crops	No Crops	Ragi, Eucalyptus	Ragi, Eucalyptus	Vegetables, Lawn, Ragi, Eucalyptus	Vegetables, Ragi, Eucalyptus	Lawn, Ragi, Eucalyptus

Sources: *Various plan documents of Bangalore; ** Bharat Maps, Google Maps, institutes websites, and other websites; *** CVC (Central Valuation Committee); # Field visit and google maps (for 2 villages only).
Note: Village names are only indicative to retain the confidentiality of key informants who have shared certain sensitive information.
$: APA is Anekal Planning Authority, whose jurisdiction lies adjacent to BDA.

Even within the green belt, many land uses align with the relaxed regulations implemented post-1995. Urban forms such as KEB substation (in 2018) and educational institutes (since 2008) such as schools, research institutes, and hostels are present closer to the developable/yellow zone (Refer Picture 2). Dotting the landscape across the green zone are developments such as – recreational spaces of badminton courts, resorts, cafes, and health centres; petty shops along the many radial roads that lead to the village; industrial spaces mainly consists of stone crushing units established since 2016; two water filtering units – one set up seven years back, and another set up three years back, a food processing unit

and a dyeing unit. Waste management units10 are also present in the interiors of the village and along lake beds, since 2013. Thus, urban utilities dot the peri-urban green belt.

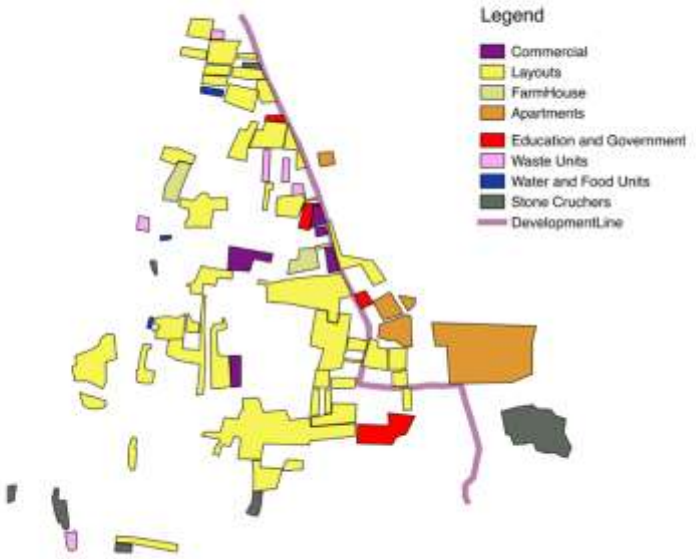

FIGURE 2 - URBAN ORIENTED LAND USE IN THE STUDY VILLAGE
Source: Land developments identified from field visits and Google Maps. Map generated using QGIS.

Note: 'Yellow zone' to the right of the 'development line' proposed for 2031, has apartments and few layouts. Education centres and commercial units are present close to the yellow zone. Stone crushers, waste management units, water, and food units are present across the village. Emerging layouts take the shape of agriculture plots and are spread across revenue lands.

Unplanned Growth In The Green Belt. Land developments in the study region indicate that land regulation facilitates land uses such as urban utilities, education institutes, and authorised residential spaces in the peripheries. However, deviations of the type under-development and unplanned development are also present in the study region; the former present to a lesser extent. Under-development is seen particularly in the case of village A (Refer Table 2), where land earmarked as industrial use for 2015 did not develop as required, due to which the subsequent plan earmarked the same region for residential use for 2031.

But it is unplanned development that is prominent in the green belt; the bulk of it constituting unauthorised residential layouts. According to the 2015 land use survey of RMP 2031, 16 percent of the agriculture zone of Bangalore had transformed to informal layouts. Likewise, forty-two layouts were identified in the

[10] Identified with the help of google maps, these units are covered with tin sheets on all sides. Dry waste from nearby hostels, apartments, and companies are processed here.

Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

study village, spanning 238 acres - the smallest layout starting from one acre, and the largest being thirty-seven acres[11]. There is a lack of clarity on the legal status of these layouts since all details are shrouded in secrecy. Most of these layouts present towards the 'urban' side of the village since 2000, were formed on land that was previously dry or had eucalyptus plantations.

Layouts take the shape of individual agriculture fields (which are small plots of land) and slowly expand to adjacent fields. Boundary walls are either partially present or completely absent to allow for the expansion of these layouts. Further, to ensure contiguous roads when the region develops, roads in emerging layouts are planned by taking into cognisance future conversion of adjacent agriculture plots. Yet, many of these layouts remain underdeveloped, since these are located in the green belt. Layouts formed in 2000 have only 50% built-up space that emerged post-2013.

Land transactions in the green belt have high risks associated with them, both to the landowner as well as the individual customers. Developers can short-change the landowner (generally farmers) by refusing to pay upfront for the land, or the landowner (farmer) can short-change the customer by declining to have sold any land. These layouts also lack basic amenities and customers have to often resort to corruptive practices with local authorities to ensure the same. Despite the financial risk and lack of amenities associated with these layouts, both the middle and poor class find these 'illegal' spaces 'affordable' for housing. While a local land market and land speculation sustain these practices, other flexibility measures such as 'regularisation' of unauthorised layouts[12], practiced since the 1950s (Nair, 2007) and way into 2020 (Pellissery et al., 2016), facilitate the proliferation of such layouts.

Further, the role of multiple governing bodies such as the BDA (Bangalore Development Authority) at the regional level and the panchayat[13] and revenue department at the local level cannot be neglected in this process. Statutory provisions allow the panchayat to prepare plans for the village under the 74th constitutional amendment act of 1992. It also allows for rural plans and urban plans to be integrated under the MPC (Metropolitan Planning Committee). But such a committee has not yet taken concrete shape, and authorities such as the BDA formed in 1976 continue planning for the peripheries. Contestations exist between these central and local authorities, where each refuses to acknowledge that the other has the power to plan.

[11] Information about a few layouts was provided by certain key informants. Keeping this as the base, other layouts were identified in google earth pro. Each layout was marked as a polygon, and the following noted - the year when roads were formed, presence of boundary, and details of when houses initially appeared and increased. A kml format of this file was processed in QGIS for further analysis such as computation of plot area.
[12] Such large flexibility measures are discussed elsewhere (see Nair, 2007, Pellissery et al., 2016, Sundaresan, 2019), and are only mentioned here due to the brevity of space and to prevent diversion of discussion.
[13] These are local governing bodies mainly responsible for development works related to roads and other amenities.

One regional planning official claims that the panchayat has no role to play in planning and neither in providing permissions for development. According to him, the panchayat is not involved in planning, and they (as well as the farmers) get to know of the plan only when it is notified to the public. On the other hand, the panchayat dismisses the role of the BDA in the green belt. The panchayat official considers only those villages under the 'developable zone' to fall under some planning authority, while those under the green belt to be under no planning authority. However, one local revenue officer mentions that the panchayat itself is responsible for the approval of sites and layouts. Though each department denounces the other, all are aware of the 'illegalities' in the green belt. One such key informant describes the extent of development in the green belt as:

People are not growing crops here, agriculture is less, they are growing sites.

5. CHANGING SOCIO-ECONOMIC CONTEXT AND FARMERS PERCEPTION

The above statement underlines the importance of farmers' role in shaping the green belt; in addition to the influence of planning measures and market conditions. The region which earlier sustained predominant dry-land agriculture with little lake irrigated agriculture underwent a significant socio-economic transformation when it was chosen for the establishment of industries in the late 1970s. A prevailing notion of decongesting the city, led to the establishment of prominent industrial areas such as Electronic City, Bommasandra, and Jigani, towards the south of Bangalore in 1978, 1985, and 1996 respectively. Initially set up for hardware manufacturing, all these industrial areas now house software industries as well. Electronic City, in particular, became the hub of software industries since 2000 and came to be known as the 'Silicon Valley' (Heitzman, 2004).

These industries provided non-agriculture based opportunities and many farmers engaged in factory work since the 1990s. A decline in the availability of both household and hired agriculture labour, led to the widespread adoption of eucalyptus plantations in dry-land areas. Irrigated agriculture too declined post-2000, due to declining water levels, fluctuating market prices for commercial crops such as vegetables, and increasing labour costs. Thus prevalent was a socio-economic context of non-remunerative agriculture and high dependence on non-agriculture sources of income. An increase in migrant workers fuelled the demand for rental housing. In an urbanising context such as Bangalore, where the price of land is high and work opportunities are relatively easy to come by, land attains place value[14] (use for commercial, residential), while its value for provisioning (agriculture produce) gets diminished.

[14] Borrowing only the phrase 'place value' from Bryant & Johnston (1992) but not it's meaning. Bryant & Johnston (1992) identify four functions of agriculture land - production (self), protection (reserves), place (house, commercial development, market-oriented agriculture), and play (recreational).

Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

Farmers working in industries were thus willing to part with their land and use this money for improving their living conditions such as building homes. This is when farmers started to perceive the restrictions applied in 1984 on the conversion of land to urban forms. Though land prices have increased when compared to the past, there is a significant difference in prices of 'developable' and 'green zone' land (Refer to Table 2). Agriculture land in villages under the 'developable' zone (A and C), garner higher prices than agriculture land in the green belt villages (D, E, and F). In village C for instance, irrigated land that is highly valued for agriculture but located in the green belt; garners a lesser price than dry agriculture land located in the 'yellow' zone. Thus, in an urbanising context, not only does the value of land for urban use gain prominence over its use for agriculture but land regulation also significantly determines these prices.

Many farmers reflect this preference for 'place value' over 'provisioning' value when they opine[15] that agriculture is not profitable when compared to the other opportunities available in this region. Farmers thus sell their land to developers, despite receiving only a few sites in return that does not provide much income. A respondent who runs a shop mentions that this aspect of the green belt prevents 'land grabbing'.

Having a green belt is good. The environment (vataavarana) will remain good. No one can grab land from us. What will we do by forming layouts? Someone will form layouts and give us only two sites. And what do we do with the two sites? There will be no income from this. (middle-age, shop owner)

But there prevails a sense that the village will develop only when the green belt status is removed. A middle-aged resident who earlier worked in the industries and now a real estate agent expresses a sense of injustice that they are not allowed to develop their land while people in other areas can do so:

We will sell only part of our land and get some money and 'improve'. Should only people living in Bangalore develop their lands? We can also give our land to apartments, and there will be more transactions. That is how I built this house, by selling land. (middle age resident practicing agriculture and real estate agent)

They feel a sense of loss when a notion of 'illegality' in converting lands is misused by land buyers who quote lower land prices:

The green belt is not good. In the areas where there is a green belt, the land rates will be half of that in the yellow belt. If the green belt price is 2000 per sq ft, in the yellow belt it will be double this (…) If this

[15] Most of the male respondents knew about the green belt and only a few feigned ignorances. It is interesting to note that among the female respondents, barring one none of the others were aware of the green belt.

was the yellow belt, we would have got better prices. And there would be more demand for land – more people would come asking for our land. Now it is only suppressed demand – people who want to cheat farmers by paying a lesser price will come to buy our land (…) People who come, use this to their advantage, and offer the farmers less price for the land. (young, van driver)

Only a few residents opine that it is good to be under the green belt, as it prevents 'land grabbing', and farmers can continue with agriculture practices.

It is good that this is a green belt. Then our lands will be with us. We can safeguard our lands. Let it remain so. Then only can we grow papaya, and have cows. (middle-age, dairy farmer)

But for how long can a region sustain agriculture, when key inputs required for agriculture practices – labour and water – are no longer available, except for land that is under market pressure for conversion?

6. DISCUSSIONS

The concept of the green belt institutionalised as part of a regulatory planning regime in Bangalore in the 1970s was significantly expanded in 1984. But flexibility measures such as deregulation and zonal relaxations implemented post-1995 resulted in a reduction of the green belt area. These measures facilitated certain developments such as apartments in the 'developable' zone, and urban utilities, schools, and recreational spaces in the green belt. But the intersection of a socio-economic context in which farmers are engaged in non-agriculture based occupations and an emerging local land market for residential spaces; has resulted in non-conforming residential land uses. Such developments render the green belt ineffective in curtailing growth and thus raise questions about the purpose of the green belt – what objective it serves and who benefits. Similar debates on the effectiveness of the green belt in Britain (Bishop et al., 2020; Bryant et al., 1982; Munton, 1983) and the world over, have resulted in the adoption of alternate forms of green spaces (Amati, 2008; Bishop et al., 2020). Suggestions made even in the case of Bangalore to rethink the green belt concept (Ravindra, 1996), need to be considered in later plans.

Plans themselves have moved from the notion of green belts supplying food to the city, to regulating climatic conditions, and as preserves for future urban growth. During the process of ensuring this 'preserve', many farmers have yielded to a suppressed land market and many customers have fallen prey to devious land scams. Though farmers/landowners benefit when they transact directly in the land as seen in the case of a previously deregulated green belt of Bangalore (Sudarshan 2011), the 'illegality' associated with the green belt forces them to transact in a suppressed land market resulting in a sense of injustice. Though flexibility measures such as 'regularisation' (Pellissery et al., 2016) allow a regulatory system to be responsive to a changing context; it only fills the coffers of the state government. Also, what

Theoretical and Empirical Researches in Urban Management
Volume 16 Issue 2 / May 2021

forms of deviations/informality gets recognised is this process is of due concern, as it is the state which wields power in determining these exceptions to planning (Roy, 2009; Sundaresan, 2019).

To counter the ineffectiveness of the green belt and to ensure a fair development process, flexibility measures need to be accompanied by institutional changes. Unlike the regional-local planning regime of Britain, planning in Bangalore is done by only regional planning authorities such as the BDA. Though the 74th Constitutional Amendment Act (CAA) 1992 stipulates planning by local governing bodies such as the BBMP (Bruhat Bengaluru Mahanagara Palike), this transition is yet to take place. Giving power to the local also means dealing with local power dynamics of local governing institutions (Munton, 1983) and community dynamics dominated by land-owning households. Local governing bodies are already known to network with developers and landowners (Pellissery et al., 2016, Sundaresan, 2019) allowing the proliferation of non-conforming land uses. Community dynamics on the other hand may lean towards deregulating the green belt as seen in the case of this study village, or it may even oppose such a move for sewage water-rich areas of Bangalore supporting extensive commercial agriculture where farmers are reluctant to convert their land to urban forms. Further, vested interests of politicians (Dossal, 2005), financiers, and developers will also be inescapable at any level of planning. But these cannot be reasons to deny the locals from planning. Merely enforcing a green belt does not ensure the sustenance of agriculture practices unless other inputs such as labour and water are available. Rather, a regional-local planning process that is dialogical with anticipatory developments (Campbell & Marshall, 2002), may allow planning to be more responsive to changing socio-economic context and serve local needs. This is an argument that partly concurs with the planning concept suggested by Geddes, which is to focus on the community to address city-specific problems (Bishop et al., 2020; Menon, 1997; Spodek, 2013).

7. CONCLUSIONS

The concept of a green belt to shape city spaces which originated in Britain in 1900 and is widely criticised thereafter, is critically examined in peri-urban areas of Bangalore by cutting across themes of – planning, land use, and livelihoods. Peripheries to the south of Bangalore witnessed two simultaneous but contrasting developments in the 1980s – the establishment of industries that enabled people to take to other occupations, and the declaration of a green belt restricting the conversion of land to urban forms. Flexibility measures such as deregulation of the green belt and relaxation of its zonal regulation over the years facilitated certain conforming land uses. But a change in contextual factors such as livelihoods of farmers and the proliferation of a local land market resulted in non-conforming residential spaces post-2000.

A similar situation prevails across the diminished greenbelt of Bangalore, barring regions that have good water sources and those that lack urban work opportunities. For planning to be effective, flexibility measures that are responsive to different socio-economic conditions need to be adopted. This will require institutional changes that give prominence to local institutions, and also engage with local power dynamics to balance regional development with local requirements.

More studies on the green belts of other cities are required to understand similar dynamics. But given that green belt declarations are not sufficient to sustain agriculture practices, and these only act as preserves for future urban growth at the cost of farmers and customers of land, alternative ideas for green spaces that serve the purpose of biodiversity/climate regulation and recreation, needs to be considered.

REFERENCES

Amati, M. (2008). *Urban green belts in the twenty-first century* (M. Amati (Ed.)). Ashgate.

Bengaluru world's fastest-growing tech hub, London 2nd, Mumbai at 6th position: Report. (2021, January 15). *Mint*. https://www.livemint.com/news/india/bengaluru-world-s-fastest-growing-tech-hub-london-2nd-mumbai-at-6th-position-report-11610598675570.html Accessed on 23rd Jan 2021

Bishop, P., Perez, A. M., Roggema, R., & Williams, L. (2020). *Repurposing the Green Belt in the 21st Century*. UCL Press.

Booth, P. (1995). Zoning or discretionary action: certainty and responsiveness in implementing planning policy. *Journal of Planning Education and Research*, *14*(2), 103–112.

Brook, R. M., & Davila, J. (2000). The Peri-Urban Interface: a Tale of Two Cities. In *School of Agricultural and Forest Sciences, University of Wales and Development Planning Unit, University College London* (Vol. 80, Issue 4). https://doi.org/10.1111/j.1467-6494.2012.00749_1.x

Bryant, C. R., & Johnston, T. R. R. (1992). *Agriculture in the City's Countryside*. Belhaven Press.

Bryant, C. R., Russwurm, L. J., & McLellan, A. G. (1982). *The city's countryside. Land and its management in the rural-urban fringe.* Longman.

Campbell, H., & Marshall, R. (2002). Utilitarianism's bad breath? A re-evaluation of the public interest justification for planning. *Planning Theory*, *1*(2), 163–187.

Chatterjee, M. (1984). Viewpoints on Delhi's Master Plan Report on a panel discussion. *India International Centre Quarterly*, *11*(1), 27–55.

Dossal, M. (2005). A master plan for the city: looking at the past. *Economic and Political Weekly*, 3897–3900.

Eswar, M., & Roy, A. K. (2018). Urbanisation in Karnataka: Trend and Spatial Pattern. *Journal of Regional Development and Planning*, *7*(1), 61–69. http://www.jrdp.in/currentissue/7_1_5.pdf

Govt withdraws provisional approval to Revised Master Plan - 2031. (2020, July 13). *Deccan Herald*. https://www.deccanherald.com/city/govt-withdraws-provisional-approval-to-revised-master-plan-2031-860442.html (Accessed on 22 November 2020)

Gowda, U. C. R., Chandrakanth, M. G., Srikanthamurthy, P. S., Yadav, C. G., Nagaraj, N., & Channaveer. (2012). Economics of Peri-Urban Agriculture: Case of Magadi Off Bangalore. *Economic and Political Weekly*, 75–80.

Grant, M. (1992). Planning law and the British land use planning system: an overview. *The Town Planning Review*, 3–12.

Halkatti, M., Purushothaman, S., & Brook, R. (2003). Participatory Action Planning In The Peri-urban Interface: The Twin City Experience, Hubli–Dharwad, India. *Environment and Urbanization*, *15*(1), 149–158.

Heitzman, J. (2004). *Network city: Planning the Information Society in Bangalore.* Oxford University Press.

Jagannathan, N. V. (1987). Planning in new cities: the Durgapur experience. *Economic and Political Weekly*, 553–558.

Kewalramani, G. (2011). Managing the Peri-urban Interface of Mumbai: A Case Study of the Vasai-Virar Region. In J.K. Dikshit (Ed.), *The Urban Fringe of Indian Cities: Professor Jaymala Diddee Felicitation Volume*. Rawat Publications.

Krishnankutty, M. (2018). *Interrogating Land-Use Planning In India: Knowledge, Institutions, Practice*. Ph.D Thesis. Tata Institute of Social Sciences, Mumbai.

Lal, H. (1987). *City and urban fringe: a case study of Bareilly*. Concept Publishing Company.

Mahendra, B., Harikrishnan, K., & Krishne, G. (2010). Urban governance and master plan of Bangalore City. *Institute of Town Planners, India Journal*, *7*(2).

Menon, A. G. K. (1997). Imaging the Indian city. *Economic and Political Weekly*, 2932–2936.

Munton, R. (1983). *London's Green Belt: Containment in Practice*. George Allen & Unwin (Publishers) Ltd. https://archive.org/details/londonsgreenbelt0000munt/mode/2up

Nair, J. (2007). *The Promise of the Metropolis: Bangalore's Twentieth Century*. Oxford University Press.

Nallathiga, R. (2009). From master plan to vision plan: the changing role of plans and plan making in city development (with reference to Mumbai). *Theoretical and Empirical Researches in Urban Management*, *4*(4 (13)), 141–157.

Narayanan, N. P., & Véron, R. (2018). Informal production of the city: Momos, migrants, and an urban village in Delhi. *Environment and Planning D: Society and Space*, *36*(6), 1026–1044.

Patil, S., Dhanya, B., Vanjari, R. S., & Purushothaman, S. (2018). Urbanisation and New Agroecologies. *Economic & Political Weekly*, *53*(41), 71.

Pellissery, S., Chakradhar, A., Iyer, D., Lahiri, M., Ram, N., Mallick, N., Kumar, N., & Harish, P. (2016). Regulation in Crony Capitalist State: The Case of Planning Laws in Bangalore. *Der Ö Entliche Sektor - The Public Sector*, *42*(1), 111–119.

Qviström, M. (2010). Shadows of planning: on landscape/planning history and inherited landscape ambiguities at the urban fringe. *Geografiska Annaler: Series B, Human Geography*, *92*(3), 219–235.

Rao, V. L. S. P., & Tewari, V. K. (1979). *The Structure of an Indian Metropolis: a study of Bangalore*. Allied.

Ravindra, A. (1996). *Urban land policy: A metropolitan perspective.* Concept Publishing Company.

Robbins, P. (2012). *Political Ecology: A Critical Introduction*. Wiley-Blackwell.

Rout, S. (2017). Master Planning Approach in Urban India: Alternatives/Improvements? *Electronic International Interdisciplinary Research Journal*, *6*(5).

Roy, A. (2005). Urban informality: toward an epistemology of planning. *Journal of the American Planning Association*, *71*(2), 147–158.

Roy, A. (2009). Why India cannot plan its cities: Informality, insurgence and the idiom of urbanization. *Planning Theory*, *8*(1), 76–87.

Sharma, H. S., & Mishra, R. N. (2011). Evaluation of Master Plan and Changing Character of Fringe Areas of Jaipur Urban Complex. In Jutta K Dikshit (Ed.), *The Urban Fringe of Indian Cities: Professor Jaymala Diddee Felicitation Volume*. Rawat Publications.

Simon, D., McGregor, D., & Nsiah-Gyabaah, K. (2004). The changing urban-rural interface of African cities: definitional issues and an application to Kumasi, Ghana. *Environment and Urbanization*, *16*(2), 235–248.

Sinha, M. M. P. (1980). *The impact of urbanization on land use in the rural-urban fringe: a case study of Patna*. Concept Publishing Company.

Spodek, H. (2013). City planning in India under British rule. *Economic and Political Weekly*, 53–61.

Sridhar, K. S. (2010). Impact of land use regulations: Evidence from India's cities. *Urban Studies*, *47*(7), 1541–1569.

Sudarshan, P. (2011). *The Expanding City: Land Development and Urban Planning in Bangalore.* Ph.D Thesis. University of Hyderabad.

Sundaresan, J. (2019). Urban planning in vernacular governance: Land use planning and violations in Bangalore, India. *Progress in Planning*, *127*, 1–23.

Tewari, V. (2011). Managing the Urban Fringe of Indian Cities. In Jutta K Dikshit (Ed.), *The Urban Fringe of Indian Cities: Professor Jaymala Diddee Felicitation Volume*. Rawat Publications.

World Bank. (2013). *Urban agriculture: Findings from four city case studies*. Urban Development and Resilience Unit.