

Green Belt, a Local Approach For Environmental Challenges

Frankfurt Green Belt

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Abstract | When the populations in the cities are increased, their suburbs are exposed to expansion of the urban space, which leads to advancement of the cities in their vicinities. One way to prevent extensive growth of the cities is creation of green belts around large cities. This approach has many environmental values, making the nature and extensive perspectives available for urban communities. City of Frankfurt is one of the successful examples in utilizing green belts. This paper deals with analysis of green belts, especially the Frankfurt green belt. Due to its geographical situation, this city has valuable natural resources in its surroundings that urban managers have preserved them intellectually, preventing irregular expansion of the city. A multi-functional space for the green belt in a natural area was considered for the citizens in the plan by Bernard Lassus. In addition to promoting the region ecological levels, this space has transformed it into a place for entertainment and education for the urban community. For unification of the existing irregular places in the city suburbs, Lassus made necessary actions in this plan to establish unified generalities comprised of different elements, by acknowledging the differences of the places and also their organization. One of the most important achievements of this plan is the distinction of landscapes and preserving various living species, agricultural and jungle lands around the city and creating intermediate social activities for supporting an active urban community.

Keywords | Green belt, Nature, Urban Development, Urban Suburb.

Introduction | By overcoming urban culture to the rural culture, people gradually inclined towards urban life, and migration from villages to cities caused irregular expansion of the cities. The rapid growth of the cities led to moving of many dwellers towards the suburbs. Green belt is a decision in allocating land uses, utilized in land use plans for preserving and maintaining undeveloped regions, natural areas, or agricultural lands around city regions. In case of not controlling these belts, they may take in rural areas in future, merging neighboring cities in each other. Naturally, green belt is an invisible line that defines an edge around a specific area, preventing the expansion of the region. One of the successful examples of creating the green belt around the city of Frankfurt that is designed by Bernard Lassus. Frankfurt green belt has surrounded the city, and everyone has to experience crossing it to enter into the city. Lassus's approach in this design for creating a generality about the city was along with converging interventions for organizing irregular natural land pieces, in such a way that each intervention does not have destructive contradictions with others, and in addition to preserving its nature, each of the existing piece creates a mutual value for the other.

Green Belt, An Approach For Defining The Urban Edge

The concept of Green Belt was initially suggested in the late 19th century. In 1898, Ebenezer Howard's proposed garden cities were planned for creating independent communities surrounded by green belts. These cities carefully included balanced areas of residences, industries, and agriculture. Professor Sir Peter Hall argues that the history of the Green Belt can be divided into three phases, the first being the designation of Green Belts in London and Sheffield by local authorities between 1935 and 1947, the second being those immediately following the Town & Country Planning Act 1947; and the third phase post-Green Belts since the 1960s, when the area covered by them has expanded considerably (Philips & Spiers, 1926: 10-11). The preserving aspect of green belts was only considered before 1990s, but since then, the entertaining and environmental aspects of the green belts have been taken into account, and new functions have also been defined for that. Following the London model, green belts have also been developed in other cities, especially in Europe and Asia, being transformed into a generalized idea for management of growth and conducting suburbs (Dadashpour et al., 2014: 295).

In fact, the main reason for selecting green belt is dedicated to five organized aims in the Planning Policy Guidance of London, as follows:

- 1) "to check the unrestricted sprawl of large built-up areas;
- 2) to prevent neighboring towns from merging into one another;
- 3) to assist in safeguarding the countryside from encroachment;
- 4) to preserve the setting and special character of historic

towns;

5) to assist in urban regeneration, by encouraging the recycling of derelict and other urban land." (Buchanan, 2006: 13-14).

Green belts primarily were considered as an approach for preventing horizontal growth of cities and preserving cities physical structures in urban planning. This green element of urban margin leads to control the city growth in the suburbs, providing consistency and specific structure for the urban edges by preventing irregular expansions of the city margins, and preserves the proportions in urban structures. Moreover, green belts support rural communities and their independent identities by preventing from combination of villages in their adjacent cities. Rural residential places and agricultural lands in between have created independent identities. In addition to separating the residential places from each other, these green agricultural spaces are considered as a unifying factor for formation of the structure of villages. However, this rural identity structure is destroyed by the expansion and development of cities and combining with the rural regions, while preserving rural communities is essential for maintaining ecological balance, as well as controlling soil erosion and environmental effects. In addition to the physical performance of the green belt that stabilizes urban edges, the cities can benefit from its positive ecological effects. Preserving plant coverage and forest areas in the vicinity of cities provides ecological balance, and these spaces prevent entering disturbing dust and wind into the urban environment. On the other hand, preservation of natural ecosystems provides potentials for creating a network of continuous natural settlements for plants and animals, causing stability of diverse biological species. In addition to physical and ecological performances of the green belt, the subject regarding its aesthetics for the related landscapes is also considered. Preserving the integrity of natural ecosystems (mountains, rivers, forests, plant coverage, etc.) around the cities leads to formation of natural regular and appropriate views and landscapes for urban areas. Purposive design of spaces with social, entertaining, cultural, and education approaches in green belts helps restore unused deserted lands left within the natural settlements. It is done due to inclinations towards interactions with the nature, for eliminating mental and educational needs of children and adults within the natural environment to promote people's knowledge about the environment and nature, ultimately leading to social and cultural stabilities. On the other hand, presence of the citizens and tourists in the designed spaces within the green belt and their exploitation of the provided services lead to economic profitability and stability. Different approaches for the green belts and their aims can be observed in the following table (Table 1).

Disadvantage of Creating Green Belts

"The accepted criticism about green belts is that they can encourage bouncing developments or the developments

Table 1: Analysis of the approaches and aims for establishing the green belt. Source: Author, 2017.

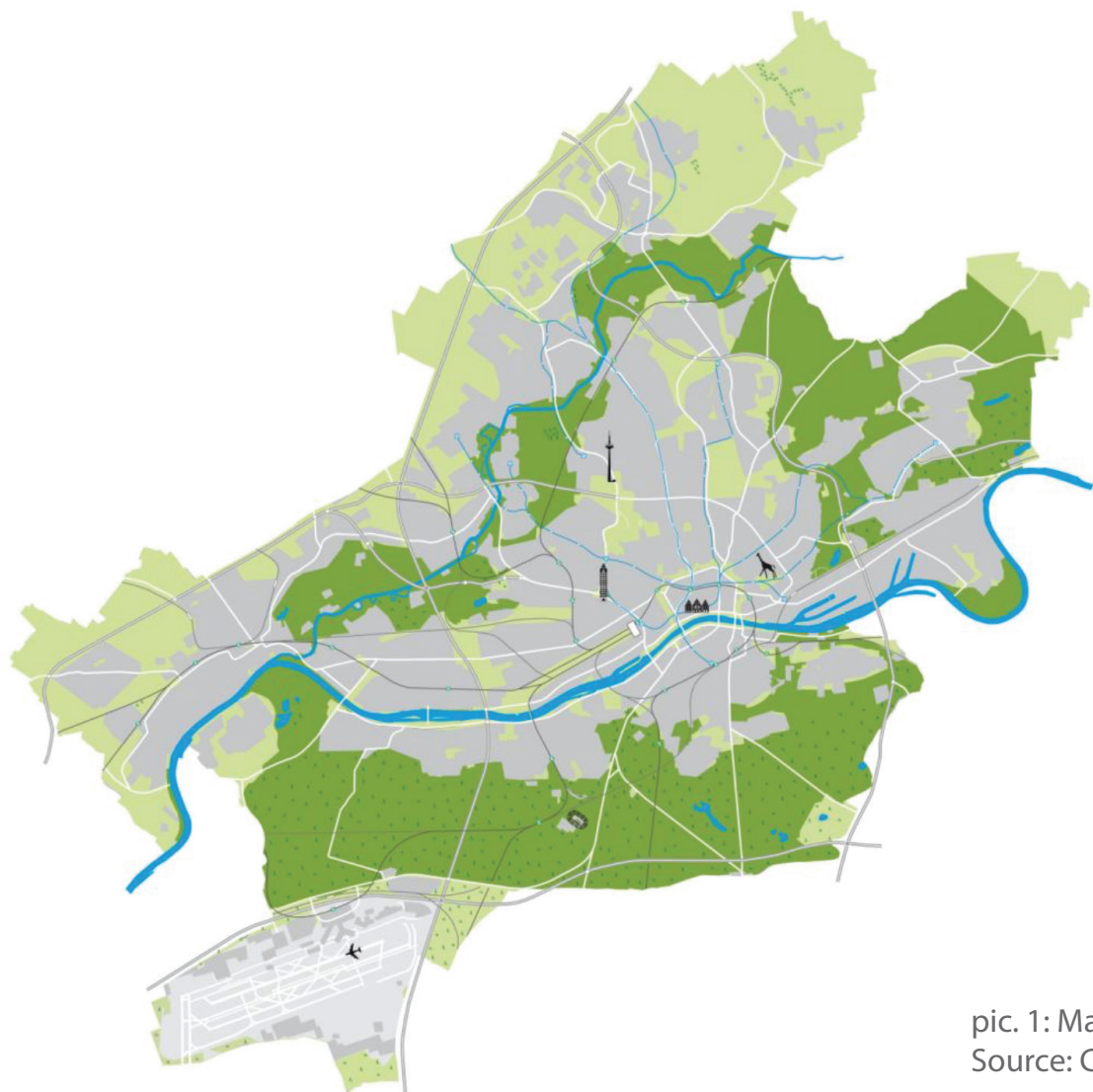
Approach	Regulations and criteria	Aim
Ecological	Preserving natural ecosystems	Preserving diverse plant species and natural settlements for animals
Ecological	Preserving agricultural lands	Reducing pollutions due to dust
Physical	Creating boundaries around the city	Preventing irregular expansion of cities
Physical	Preserving rural communities	Preventing combination of villages in urban areas and maintaining their independent identities
Physical	Creating passages and walking routes	Easy access to the nature
Aesthetics	Maintaining the integrity of plant coverage and natural ecosystem	Access to suitable landscapes for the citizens
Educational-cultural	Creating educational spaces	Promoting people's information about nature
Social-cultural	Creating entertaining spaces	With regards to human interactions with the nature

outside the green belts.” (Bonn & Modarres, 2014: 171). In fact, green belts are physical boundaries against natural expansion of cities. In the case of no extension possibilities for the settlements, increasing population of the city can lead to construction of new town. It is useful from one point of view for helping to preserve the natural environments around the cities, preventing pollutions in large and metropolitan cities. However, from another point of view, it develops other problems indicating that resident people in towns or estates require longer daily trips for commuting to work or supplying their needs. This leads to higher rates of using vehicles. It is considered as a serious problem for the pollution in the cities. “The second criticism concerning green belts as the boundaries of expansions is that it increases the real prices of properties, and the number of houses requiring adequate financial means is extensively reduced.” (Ibid: 172). The other criticism is that some regions that are allocated for green belts have quite low values or they are even worthless for the environment and

urban population, despite maintaining the landscape. For instance, not only the compact concentrated land allocated to agriculture does not provide entertainment opportunities, but also it does not provide access to clean air and environment due to using chemical fertilizers and pesticides for agricultural purposes, which are harmful for both the environment and also human beings.

Frankfurt Green Belt

The green belt is considered as Frankfurt lungs. Its 8000-hectare coverage forms almost a third of the city area and an almost 70 km belt along the geographical distance around the city, which includes 40 parks, 200 tourist attraction areas, 350 km road network, and many instruction programs (Pic. 1). The specificity of this green belt is its diversity of different landscapes and rich complexes of plant and animal lives. This belt forms an extensive area of Frankfurt landscapes, and includes fruit gardens, grass, natural environment, streams,



pic. 1: Map of Frankfurt green belt. Source: Courtesy of Wichert, 2001 (A): 10 & 3.



Pic. 2: Children's playground and playing field on the runway of the old airport. Source: Courtesy of Wichert, 2001 (A): 25.

farms, parks, forests, rest and sporting areas, which create a small world of landscapes in Rhine – Main region. Quality facilities in the green belt and its natural attractions have transformed it into one of the popular rest areas for people. When Frankfurt Municipality consultants made decisions in 1991 for expanding the region as a green space belonging to the municipality and supported the plan, they provided the basis for the green belt. In “Habitat 2 Conference” in Istanbul in 1996, the nation's union acknowledged this green belt as a positive example of sustainable urban development. Developing its access routes, better relations to intercity and open spaces and green areas and establishing entertaining areas in regions are among the mid-term aims of this green belt.

“That belt is revealed as an ensemble of heterogeneous places which do not have to be standardized by a treatment that aims to give them a common unity, but, on the contrary, accentuated in their differences by mutual valorization and set within an explicit limit. The cleansing of the polluted places cannot resolve the landscape problem, environment and landscape being two different notions: one is technical, the other cultural.” (Lassus, 1998: 161)

The applied viewing concept should be considered once again for appropriate intervention in the nature according to the trend of sustainability. This trend has different stages, and before anything else, the creative analysis in the site is important, which includes transiting from the primary unawareness for getting close to the site according to the specifications of the place, history and the existing facilities. Then, by searching about the preferred viewpoints, the small landscapes and the outlooks that link them together should be defined, and the point to be considered is that there are aspects and layers of human activities in the depth of these places (Lassus, 2001: 4). The creative interventions in the nature of the green belt in Frankfurt are the points to be considered, as follows.

Frankfurt Green Belt and Education and Exploration Program

Various programs are provided for children and the young

people within the programmed area of the green belt, to do explorations, and for amusements and learnings via different sports and entertainments that bring possibilities for more precise experiences and attentions. Creating different landscapes all over the green belt indicates instructive points for children and the youth to be encouraged to think in nature within the framework of entertainments. The possibilities for adventures in nature is predicted in children's playgrounds by playing games and having active experiences with natural elements such as wood, soil, water and fire (Pics. 2 & 3). There was a military base in the area of Frankfurt green belt, which is changed into a park and it is now compatible with entertaining activities such as skating, kite riding, or a place for picnic. Some parts of the concrete runway of the airport in it are also destructed and its infrastructural soil is used for growing plants, and some parts of it are changed into the children's playground. However, a small part of the runway is kept for creating a pedestrian walkway among natural plantations. The deformation of this old airport is properly designed for general activities with ecological approach, and the natural settlement is also modified in the site (Pics. 4 & 5). Attractive cultural attractions are combined in some parts of the green belt with new methods; a collection of sculptures by using comic arts exist in the green belt that add up to the attractions of this space. Moreover, a museum of comic arts is constructed for exhibiting art works, and some designed elements related to weather stability using comic arts and tree arts are placed in this museum.

Passageway In The Nature

Frankfurt green belt is formed by some jungles in the south, Nidda hills, main rivers and hills in the northeast (Pic. 1), which consists of 63 km bicycle route and 65 km narrow walking path with appropriate signs as a looped route around the city (Pics. 6 & 7). Diversity of the existing natural spaces along the belt provides different sensations and experiences for the visitors, makes the understanding and usage of the natural environment possible in its best way near the urban environment. The jungles include old beech trees, pine trees,



Pic. 3: Various sporting fields in Frankfurt green belt. Source: Courtesy of Wichert, 2001 (B): 29.

and oak trees. Agricultural lands and birch and willow trees exist in the northeast of the city. Moreover, over 50 lakes and ponds are in this region. Designing the pathways for riding bicycles and walking in this area is done to encourage natural exploration experiences, and different landscapes along the preserved green belt provide the diversity of landscapes in this region. The routes are designed along the green belt in such a way not to make any disorders in the functions of each other. By constructing subways at the intersections of the highway and pedestrian ways, the consistency and integration of the pedestrian ways are preserved in the nature (Pics. 6 & 7). “In the green belt around large cities, local officials have thus understood that they had to maintain agricultural

economic activity by guaranteeing conditions that promote its durability as well as farm projects (product security, free-flow of machinery, etc.). This is how agri-urban projects have surfaced: The government in the city of Frankfurt has decided to promote close rural-urban relations via the green belt. The law of green belt is organized in such a way, in which urban communities can promote their knowledge about the environment by using the sceneries of large green areas and utilizing the required diverse lifestyle (Vidal, 2008: 6). The zero point of productivity should be referred for the simple reasoning about the concept of “returning to the nature”. This logic is not because of the recreation of the story of environment by a person, but it is because an individual has



Pic. 4: Deformed airport runway for ecological productivity in 2003. Source: Courtesy of Wichert, 2001 (A): 24.



Pic. 5: Growth of natural plant species in the area of the airport in 2010. Source: Courtesy of Wichert, 2001 (A): 24.



Pic. 6: Bicycle route. Source: Courtesy of Wichert, 2001 (A): 30.



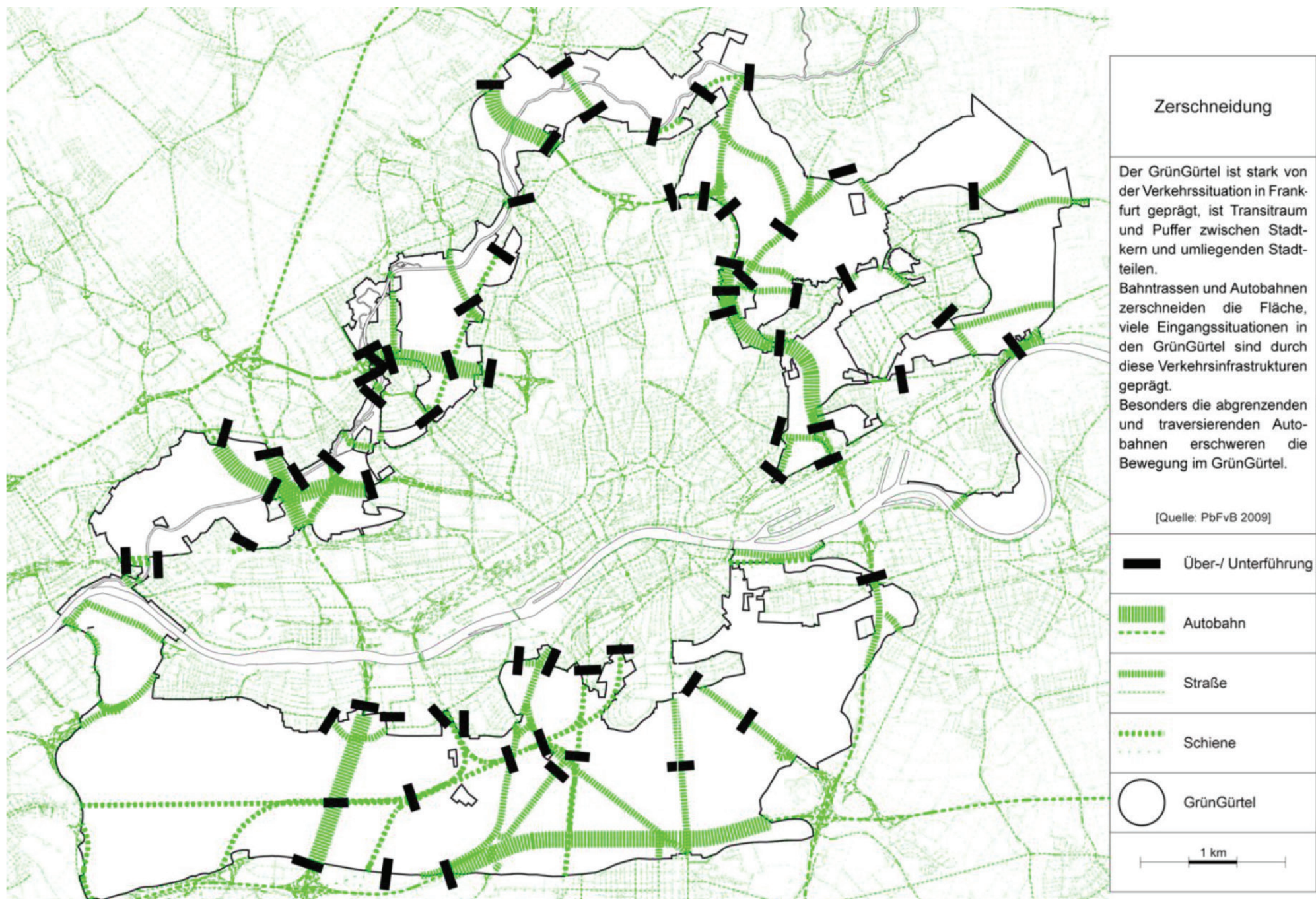
Pic. 7: Pedestrian walking route. Source: Courtesy of Wichert, 2001 (A): 21.

created one or more landscapes, or more precisely, natural places suggests specific landscapes to be designed. Organizing a space will definitely solve the problem of environment quality, but it shall not solve the problem of the green belt as a landscape related to Frankfurt, or more specifically, about other urban belts or the rural life in the vicinities, and it shall require purposive and planned designs for the landscapes.

Connection Of The Green Belt With The City

Frankfurt green belt area includes 70 km of national highways, and 335,000 passengers travel towards the city and 65,000 passengers travel away from the city, every day, which is an element for creating air pollution and sound pollution in that region (Pics. 8 & 9).

German officials wanted to set up a clearly perceptible green belt as a well-defined entity around the city. However, to

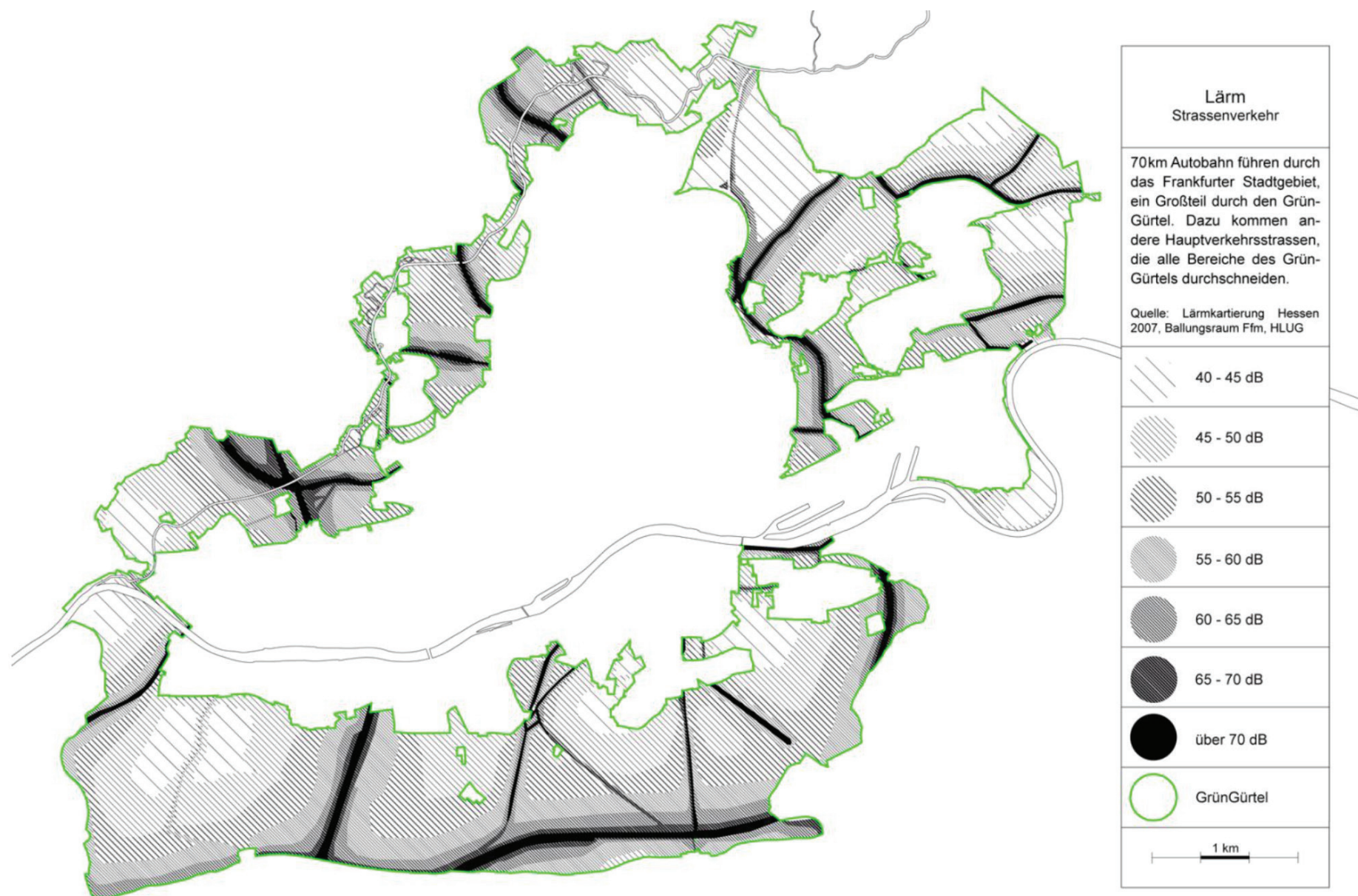


Pic. 8: Subway routes in black and highways in green in Frankfurt green belt. Source: Courtesy of Wichert, 2001 (B): 8.

reach Frankfurt one would have to choose an entry point, crossing a particular area of the belt. This meant that the belt, composed of very diverse parks, woods, fields and fallow land, would always be perceived from a particular point and, furthermore, that of all the possibilities given to the car driver none would relate to another. It was even intended to put up special road signs to make it clear to all new visiting drivers that they were actually crossing the Frankfurter Grüngürtel: almost as if one were trying to paint a horse to transform it into a zebra. (Lassus, 1994: 89). By forgetting Frankfurt, one notices then that those places are totally dissimilar, and that the Grüngürtel remains an entirety only in its opposition to the city, which is not sufficient. Its dissimilar pieces are on a scale of differentiation such that the belt includes all the other country areas that surround the other towns on the outskirts of Frankfurt and finds itself too large to have a constituted Grüngürtel, in relation to the rural areas surrounding the towns next to Frankfurt. (Lassus, 1998: 162). Thus, the green

belt should be new; it should have been the designed nature. The decisions made for a common division regarding the green belts in particular shall reduce the differences between the places that form those green belt. In any situation that the boundaries are different, transferring the appropriate specifications of a place into an adjacent place could involve discrepancies of a place to another. In fact, Frankfurt green belt the pathways of the local parks are not competing with each other; they are combined with each other in the best way to be complementary of each other.

In fact, in addition to the ecological balance, Frankfurt green belt includes multi-functional urban spaces that are considered for agricultural and forestry products and also for proper entertaining activities, which provide relations between the nature and landscaping in an appropriate manner. The advantages of Frankfurt green belt with regards to Lassus approach in designs and its disadvantages in different scales can be observed in the following tables (Tables 2 & 3).



Pic. 9: The regions with more sound pollutions within the green belt area in black color. Source: Courtesy of Wichert, 2001 (B): 18.

Conclusion | Following the challenges related to expansion of cities, designing a green belt at the place of intersection of the city and nature can be a useful approach and policy of urban planning. Green belts prevent extensive expansion of cities in the nature, preserving agricultural lands and forest regions near the cities, and they also provide proportions in city structures. Regarding environmental problems such as effects of climatic changes, shortage of water, and air pollution, green belts have

found a vital role for urban communities. Designing existing spaces in the area in such a way to have maximum productivity from the natural environment, besides creating education and cultural spaces is an attempt to reach sustainable lifestyle in the contemporary world. Frankfurt green belt already existed as an irregular entity, consisting of diverse sections that could be easily identified and did not belong to the city. The existing spaces in its area included rivers, jungles, local parks, industrial

estates, a military base, and rural regions related to Frankfurt and neighboring cities, each of which have maintained its independent identity, and on the other hand, have provided an exclusive complex via plant coverage, road networks and passageways. Lassus approach was providing consistency forthis irregular complex and creating appropriate relations between this set and the city, in order to prevent expansion of the city in the nature. Different pathways for walking, bicycle riding, sporting activities, children’s games, and entertainment in the nature were constructed with the education and

cultural approaches for the use of the public from the natural capacities, and possibilities of exploring experiences in the natural environment were considered within the frameworks of education programs. There are numerous agricultural lands in Frankfurt surrounding areas, the importance of which was considered in supporting the urban landscapes. This approach is an attempt for maintaining and empowering a chain of ecological regions for using environmental potentials for the life of the citizens, preventing unlimited expansions, and combining urban areas in each other.

Table 2: Advantages of Frankfurt green belt. Source: Author, 2017.

Approach	Positive points of Frankfurt green belt
Ecological approach	Connection of ecological networks and increasing their consistencies
Ecological approach	Preserving diverse plant and animal species
Ecological approach	Applied changes of the existing airport within the area to its primary natural structures
Ecological approach	Improvement of climatic changes
Physical approach	Prevention from irregular growth of the city
Physical approach	Creating pathways for exploration in the nature
Physical approach	Maintaining the independent identity of rural and agricultural areas existing in the region
Social/cultural approach	Creating entertaining regions in the nature
Social/cultural approach	Creating education opportunities
Social/cultural approach	Constructing the museum related to the nature

Table 3: Disadvantages of Frankfurt green belt. Source: Author, 2017.

Scale	Negative aspects of Frankfurt green belts
Local scale	Increasing the prices of urban properties
Local scale	Lack of access to residential lands in future
Regional scale	More daily trips from the center of the city to the regions behind the green belt
Regional scale	Sound and air pollutions due to vehicles travelling in the highways in the green belt
Regional scale	Use of harmful chemical fertilizers for agricultural regions next to urban regions

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