Towards an Urban-Rural-Environmental Relationship in the Metropolis: The case of Vila Bela

V Luz¹, A Fabiano Jr²

¹Architect and urbanist, teacher and researcher. Architecture and Urbanism Post-Graduation Program of Pontificia Universidade Católica de Campinas, Campinas, BR
²Architect and urbanist, teacher and researcher. Architecture and Urbanism Faculty of Universidade Presbiteriana Mackenzie, São Paulo, BR

E-mail: veraluz@puc-campinas.edu.br antoniofabianojr@gmail.com

Abstract. This paper presents principles, methods and results of a Final Graduation Work in which teaching, research and university extension are considered as an indivisible whole. This method is been realized though several years, where our choice of territory intervention constantly consists of look for locations on extreme edges of Sao Paulo’s metropolitan peripheral regions, with deep social fragility, contiguous to rural places and environmental preservation areas and impacted by the existence of at least one large metropolitan infrastructure. The search for alternative pacts in urban-rural-environmental relations begins with the understanding that these systems are inseparable and complementary. The experiment of sustainable development models in the field of higher education encompasses urban guidelines, territorial plans in diverse scales and architectural projects compromised with the site. All the work’s phases are articulated to commitments with the actual territory and its inhabitants, seeking to break through perverse conditions of the centre-periphery binomial and for new possibilities in the urban-rural-environmental relations in the metropolis. The work essays new paradigms in the relation between man-man and man-nature, assuming as urgent the environmental imbalance situation and the planetary social inequality, whose need for proposition is imperative and irreversible—regarding landscape, public spaces, habitat’s quality of life and infrastructure supply. The engagement is inseparable, constituting bonds of realizable commitments. The approach to the field is established through meetings and alignment with the community leaders and representatives, building close ties. The results of learning experience are the final research products, guidelines, an urban design of an exemplar cut and architecture projects realized, which are carried out under the guidance of this article’s authors, that are presented as a collection of alternatives to the region’s demands and priorities, and the complementary extra-disciplinary actions that are also established on voluntary bases, according to the emergences or wishes expressed.

1. Toward an environmental vision in architecture and urbanism higher education

Teaching architecture and urbanism in higher education in Brazil is considered in the field of Applied Social Sciences. It follows from this premise the hypothesis that teaching, research and extension in academic issues are inseparable fields and necessarily submitted to fine articulation. For us, this means that it is imperative to make efforts to articulate academic work to actual circumstances, dissolving boundaries between theory and practice. Reflecting on our commitment to sustainability, the election of
socio-spatial and environmental fragility situations becomes central. The experience presented in this article comes from a consolidated tradition on the Final Graduation Work method that considers architecture as a part of the city and conditioned by it, as well as our choice to enclose territories within the outskirts of São Paulo Metropolitan Region, in the final ends of the urban tissue, beside rural and environmental areas, meanwhile under the effects of some infrastructure of great regional impact. In this case, we will present the process and results related to the Vila Bela district.

2. The Vila Bela case study
The eastern zone of São Paulo has traditionally been formed as the consequence of working-class neighborhoods allocation, since the beginning of the 20th century, due to the industrialization increase. The Vila Bela district is one of the most remote places of this urban phenomenon that implies socio-spatial stratification. Its localization may be seen in Figure 1 below.

This area was a site of which only one family took possession and was gradually and informally occupied by low-income families in semi-rural way in the beginning. This people paid fees for decades to the owners that maintained a separated relationship from the state institutions from the economic and legal point of view. This is one of the urban land appropriation forms that affects approximately half of the urbanized territories of Sao Paulo city, ranging from the public or environmental protection areas occupation as well as ambiguous covenants with landowners, in procedures that reveal the social-spatial fragility and precariousness in housing supply for unattended population [1], subjugated to capital forces and dependent of the state, since wages are not enough to reproduce life in dignified conditions [2].

Many efforts have been made by organized civil society, intellectuals and the church itself, culminating in the 1988 Constitution that guarantees housing and the environment as rights, which has been regulated by the 2001 Statute of the City instrument, but the urban situation remains in a state of urgency, made worse by the current neoliberal trend.

The housing deficit in Brazil is estimated in more than 6 million houses [3]. The irregular occupations occur predominantly in the metropolitan peripheries, which are characterized by precarious housing from a constructive point of view, without land tenure guarantee, lacking public equipment and urban infrastructure. As an example of this serious conditions, the average urban sanitary sewage collection in Brazil was 60.02% in 2017 [4] less than half of this volume being treated.

Vila Bela residents, because they are not owned by the land, conquered the water and sewage supply as well as public lightning through social struggles that lasted several years. Up to the present they are not attended by any educational, health, cultural, leisure or sport public equipment, road pavement,
drainage system or qualified public spaces and their streams are in a state of neglect. Likewise, the transport system is extremely deficient, with only a few bus lines leading to the nearest subway terminal or train station. Given that, a large part of population loses from five to six hours a day in their transportation to central areas, because there is a lack of local work opportunities.

2.1. The connections with people and place
Before beginning the academic work, bonds of solidarity with the local community through their leaderships are formed. In the case of Vila Bela, commitments were made with an important local leader and two representatives of the City Council. In order to do so, these local partakers accompany the study visits of the teachers and students in the neighborhood and also are invited to the work’s intermediate and final presentations at the University, where they have the opportunity to speak and comment and we to hear them. The results of the activity are offered to the local leaderships as realized knowledge and claim instrument.

3. From the identification and survey method to the project propositions
We believe that the survey in architecture and urbanism is already a project act, and it is a way of positioning by ties of commitment, therefore we call this phase as identification.

The investigation goes deeper into multiscale sectoral systems, from the global, national, regional to the local and micro local aspects, and then an understanding synthesis of the territory denominated diagnosis is made, from which prognoses are established in urban multiscale guidelines. The sectoral themes are geomorphology/biophysical aspects—topography, fluvial system, vegetation, environmental protection areas, flora and fauna; transport systems – air, rail, road, avenues and streets, fluvial and micro mobility ways such as ladders, cycling, scooters, tuk-tuks and others like cable cars, funicular or lifting platforms; urban tissues and morphology patterns; land occupation and land uses; buildings height jigs; equipment - educational, health, cultural, leisure or sport; infrastructure – potable water supply, sewerage, waste collection and recycling, energy, communications; landmarks; rural territories; landscape unites; urban and environmental legislation; population and community characteristics – origins, age groups, genders, occupations, incomes, community associations, habits, traditions, skills, talents, weaknesses and problems, potentialities, quality and vulnerability in childhood, old age and adult life. The Figure 2, bellow, shows some examples of this investigation.

![Figure 2](image_url)

**Figure 2.** Investigation of sectoral systems of Vila Bela: geomorphology, waste collection, urban tissues types.

An urban project is conceived by the team, giving shape and body to the conceptual and diagrammatic purposes, following the sectoral systems and the multisectoral syntheses derived from the
survey and observation and its guidelines. Often analogous urban projects are discussed as a collection of references in the attempt to approach to solutions of excellence in similar situations.

From the urban project an exemplary urban design cut is developed in its details as a tangible approximation and as an achievable landscape.

Individual architecture projects are made up by each student involved, with choices about the theme, location and scale, through clear relationships with the territory. These projects are deepened in their morphological and volumetric characteristics, deployment and articulation on the site, programs, structural and construction systems and components, ambience, conceiving the buildings and free spaces until their details.

New paradigms in urban-rural-environmental relationship and in man-man and man-nature relations are sought in order to point out some possibilities of overcoming the contemporary environmental and social crises which is world-wide. However, small actions have their potential as exemplarities, even if they are carried out in the educational scope, seeking their transcendence in real life for real people, which is perhaps their greatest importance.

4. The urban project and the urban design cut as embodiment of intentions

Vila Bela, whose genesis goes back thirty years, has a significant occupation of the land due to the urgency of housing, but with buildings from one to eventually three floors and without any public equipment, given its land irregularity, which forces its population to travel long distances to access to child day care centers, educational, health or other systems.

Not all habitations are supplied with the minimum necessary places to domestic activities. The urgency for housing gradually determined the neighborhood conformation, that presents typical morphology of peripheral regions. The buildings are crowed by the central ridge line that became an avenue where buses pass and along the two valleys of the Caaguaçu and Machado streams. The other water courses are abandoned or used as a spillway for sewage. Between the ridge and the valleys, slopes of high declivity, now also densely occupied, make the mobility difficult.

Contrasting with this agglomeration and constructive density, there is a large green area at the southeast of the neighborhood – the Conquest Park, violently sectioned by the Jacu-Pêssego avenue, a temporary extension of the metropolitan Ring-road, that became permanent. To the east of this road, rural areas begin. Towards the south, industrial municipalities and after the preservation regions of the Atlantic Forest and of the springs of the Billings Dam. The Sapopemba avenue, an east-west regional link, limits the neighborhood to the south.

The closest mass public transports are the railroad - Turquesa line – connecting the city center to the industrial municipalities to the south, the Red line of the center-east subway, whose Itaqueru terminal is far from Vila Bela, to the north, that continues to Mogi das Cruzes municipality as a railroad and the suspended monorail – the Prata line, under construction, to the south. For access to all them, people need to do a slow bus ride.

As a regional guideline, it was decided for us to enhance the Jacu-Pêsssego avenue by installing a surface subway allowing the dynamization of its surroundings structured by poles from its new stations, as well as the installation of a light rail vehicle system on the Sapopemba avenue, articulating it until the Prata line.

The existence of a public university currently on the Jacu-Pêssego avenue – the Unifesp/Institute of the Cities, which intends to have as study territory and target public the eastern zone, provided the hypothesis of real collaboration through our articulation. In our project it was recommended that there will be its extension in the rural area as the Field Institute, promoting training and support for reforestation, agroforestry and agricultural activities. A guidelines system aimed at qualification for work and income articulated to landscape preservation. The use of solid, organic or recyclable waste as a raw material was prioritized, postulating the ‘zero waste’ concept for the community.

We present at Figure 3 some examples of these guidelines and at Figure 4 it is possible to have an overview of the neighborhood:
In the urban tissue, the local streets parallel to the waterfront buildings receive transportation of buses and vehicles for the waste collection; other streets will have light mobility such as tuk-tuks, bikes and others. The slopes will be supplied with lifting platforms that will also receive loads and public cleaning waste.

The Peramirim avenue, at the central ridge, is now a priority for pedestrians and convivial spaces. All open spaces, especially those bordering waterways, will be reforested or supplied with communal vegetable gardens, orchards or small animals farming such chickens or goats.

Vila Bela was understood – given its strong characteristic of neighborhood ties and community articulation realized by leaderships -, as a field of possibilities to what we called ‘places of affection’. Affects and talents can, by means of few architectural interventions, make themselves more present,
weaving a system of communitarian spaces of free appropriation, where the memory, the meetings, the civic activities and tasks can be dynamized.

The Figure 5 shows indications of potential activities in the neighborhood, when in the midst of poverty, almost indigence, one can find important indications that can be strengthened.

![Figure 5. Vila Bela public spaces current situation with indications of potential uses and talents.](image)

Given the absence of domestic supply in several homes, from spaces such as appliances for everyday use, we conceived what we call ‘public houses’. In this way laundries, clotheslines, kitchens, dining spaces, bathrooms and public locker rooms form a range of spaces for those who does not own can use them collectively.

Organic waste will be the subject of composting and recyclable waste will be sorted and can be disposed of by generating income or used in community-based factories in a solidarity economy basis.

What we call ‘spaces of affection’ can be understood as ‘spaces of talent’, where the inhabitants’ own abilities can be dynamized in collectivity as well as ‘party spaces’, understanding that the communion of affinities is always a hypothesis of joy and pleasure together.

Rainwater drainage will occur in rain gardens and sanitary sewage, where there is no public supply, will be carried out by filtering gardens or evapotranspiration basins with bioremediation treatment, keeping the rivers clean and pleasant. In Figure 6 we present some illustrative schemes of these solutions.
Figure 6. Bioremediation systems for drainage and sewage.

It was established a network of lifting platforms articulated to the free spaces, potentiated as spaces of affection/talent/parties or renaturation and cultivation, obeying the logic of the bus circular route and the collection of the waste to be used. Figure 7, below, illustrates this matrix:

Figure 7. Vila Bela territory with urban proposal of nobility systems articulated to free spaces and equipment.

It was chosen, as an exemplar cut – where one can exercise the implantation of fundamental elements of the urban Project -, a lane that houses a watercourse channelled by the population itself, as a matter of urgency, once the inhabitants directly pour their household sewage. The site is presented in its current situation at Figure 8, where the precariousness of public spaces is remarkable, with no minimum
infrastructure for paving, drainage, lighting – for passage, meeting or staying – without conditions or quality to carry out convenient shelter for use, coexistence, habitability.

In this urban cut a system of community spaces was structured where sometimes the watercourse emerges, agreeing its space with the people passage, given the narrow condition of the alley.

The floors over the stream course will be made in grids to maintain their visibility and the other spaces of passage or permanence alternate plastic recycled decks, made in community factories, as well as drainage channels of the stream.

Rain gardens, filtering gardens and evapotranspiration tanks are articulated for the proper rainwater drainage and domestic sewage treatment.

This lane begins in Conquest Park, where the source of the stream is located and ends in a stretch of larger stream, the mouth of the watercourse, which is also renatured.

It is hoped that by qualifying the green spaces can be restored the fauna – fishes, birds, small mammals – for harmonious living in the urban environment.

‘Public house’ spaces are anchored to the system such as bathrooms, laundries, clotheslines, kitchen and public eating facilities.

Two lifting platforms allow easy access to the sector.

Figure 9 illustrates the deployment of the projected stretch:
Figure 9. The exemplarity of an urban design cut: public spaces, sewage and drainage infrastructures in bioremediation systems, lifting platforms, ‘public houses’ bathroom, laundry, cooking and eating spaces in collective ways.

From the urban reconfiguration proposal, architectural projects were listed in order to establish situations articulated to their assumptions, where it is possible to make thematic programmatic, morphological, construction and detailed approaches. Some projects addressed to theme of ‘public house’, others focused on the requalification and revitalization or environmentally sensitive areas, seeking their renaturation and the possibility of adequate enjoyment in preservation conditions. In some cases, the fauna protection was prioritized and in others the strengthening of symbolic aspects was the focus.

5. The architectural projects: toward an achievable worldview
Eleven architectural projects were carried out with the following subjects and responsible students, whose joint authorship of each work phase should be emphasized, since it is a collective process:
- public house/dining room – Rodrigo Azevedo;
- public space/meeting of waters – Luisa Parisotto Vaccari;
- public house for everyone – Naomí Farinazzo;
- public house between slabs – Marco Aurélio Arruda Barros;
- riverside public space of expressions – Samira Batista da Silva;
- clotheslines square – Felipe dos Santos;
- public health houses – Thais de Freitas;
- chalkboard school – Camila Godoi;
- Maria Soledade memorial – José Camilo Carlos Junior;
- graveyard forest of conquest – Breno Pires Pilot;
- bird landing house – Higor Souza dos Santos.

We will present some of these projects for a better understanding of the multi-scalar methodology to clarify it within the scope of architecture.
Figure 10. Architecture projects themes and localization.

The ‘public house’ developed to shelter a community vegetable garden, fair, cooking and community meals is part of a system where it was understood the pipeline Rio Claro that supplies the eastern zone as a territory that could be realized as a regional linear park from Vila Bela to Moóca district and to the first reservoir at the countryside. For this, a shared walkway for pedestrians, bicycles and light vehicles was conceived, capable of transporting loads and waste, articulating the whole system, as seen in Figure 11. The Vila Bela ‘public house’, installed at Stretch F, is a little part of it, constituted by the program described above, where the raised walkway connects with the bus and the light rail vehicles systems. Combined with the vegetable garden and a warehouse of waste sorting and processing was installed a shelter for preparation and meals, a public fair for exchange of products and bathrooms served by filtering gardens, all this in community processes, adjacent to the urban fabric, as seen bellow, at Figure 12.
Figure 11. ‘Public house’: community vegetable garden, fair, cooking and community meals. Regional situation.
Figure 12. ‘Public house’: community vegetable garden, fair, cooking and community meals. Implantation, plan, section, elevation. Urban walkway perspective.

Another example, a birds recuperation centre, is articulated to a metropolitan concept, seeking to preserve and protect the fauna in its migratory processes, disoriented by the existence of the urban context, rails and roads between Sea and Cantareira Mountain Rages and the rural areas, conceived with the understanding from the Atlantic Ocean to the regional interior. The project is detailed from the general design to the building components, as shown in Figures 13 and 14.
Figure 13. Birds recuperation centre. Regional system, project site, regional section.
Figure 14. Birds recuperation centre. Plan, perspective, section, elevation, building components.

Figure 15. Birds recuperation center. Details.
Another example is the House of Health that appropriated the urban voids contiguous to the stream, keeping its fluidity spatiality but qualifying it from the articulation of volumes and free spaces, with a socially necessary program of treatment and prevention of diseases and with a constructive conception didactic and replicable.

Figure 16. Houses of health: 1. Neighborhood situation. 2. Use of urban voids. 3. Courses outlines. 4. Upper floor of sectors 5 and 6. Ground floor of sectors 7 and 8. Perspectives. 9. Schematic of replicable openings in the project and in existing buildings.
References

[1] Maricato E 1982 *A Produção Capitalista da Casa e a Cidade n Brasil Industrial* (Sao Paulo: Alfa Ômega)

[2] Rolnik R 1997 *A Cidade e a Lei: Legilação, Política Urbana e Territórios na Cidade de São Paulo* (Sao Paulo: Basiliense)

[3] Fundação João Pinheiro Centro de Estatística e Informações 2018 *Déficit Habitacional no Brasil 2015* (Belo Horizonte: FJP) http://fjp.mg.gov.br/index.php/docman/direi-2018/871-6-serie-estatistica-e-informacoes-deficit-habitacional-no-brasil-2015291118/file

[4] Brasil Ministério do Desenvolvimento Regional Secretaria Nacional de Saneamento Sistema Nacional de Informações sobre Saneamento 2019 *Diagnóstico dos Serviços de Água e Esgotos 2017* (Brasília: SNS/MDR)