Medium-sized Brazilian Cities, Urban Planning and Sustainability: The case of Passo Fundo, in Southern Brazil

ADRIANA GELPI, ROSA MARIA LOCATELLI KALIL, TANISE SPIELMANN, ACÁCIO DOLCI ROSALEN
Laboratory of Urban and Regional Studies
Faculty of Architecture and Urbanism, University of Passo Fundo
Campus I – BR 285 – São José District, Passo Fundo, RS / Brazil
e-mail: agelpi@upf.br; Kalil@upf.br

Abstract: This research is about urban planning and sustainability of cities through their spatial organization and municipal laws. It selects parameters of urban sustainability and evaluates if the municipal master plan of a medium-sized city, in Brazil, already reviewed after the City Statute approval, considered them, under the conception and implementation of its urban plan. After comparative study of master plan and the accomplishment of field survey, the research allows to assert that the implementation of sustainability parameters selected by work, qualify in a spatial and environmentally the city of Passo Fundo, RS, Brazil.

Key-words: Planning; Sustainability; Passo Fundo, RS, Brazil.

1 Introduction
The city of Passo Fundo approved, in 1984, a master plan that increased the height level of buildings downtown, considering them as a local of regional reference, encouraging the verticalization of the central area [8]. On the other side, this plan favored the indiscriminate population growth, the destruction of the historic heritage and urban memory, moving and disaggregating neighborhoods, suppressing recreation areas, compromising environmental sustainability and segregating peripherally, the poorest population. Following the debate promoted by the City Statute [2], law that defines urban norms which encourage sustainability, the social role of the property and the citizen participation, among other issues, in 2006, the city worked on the review of the city plan 1984, trying to reach more balance, urban accessibility and environmental quality. Therefore, the objective of this work is to evaluate the Master Plan of the Integrated Development of Passo Fundo – the PDDI [11], reworked in 2006, verifying if it presented, since it was accomplished through the review of the city plan already existent and after the promotion of the City Statute [2], advances or items related to the aspects of social justice and urban-environmental sustainability. This work intends to verify, by means of a field research, how the articles provided in law and identified by the research, have been implemented in urban space.

2 Identifying parameters of urban sustainability
In relation to parameters of urban sustainability, the 10 European Common Indicators for the Local Sustainability presented by the European Communities [5] approach the theme, by taking into account: 1) citizens satisfaction towards their local community, 2) local contribution to climate change, 3) local mobility and transportation of passengers, 4) accessibility to green areas and local services, 5) quality of local air, 6) house – school moving for children, 7) sustainable management of local authorities and companies, 8) noise pollution, 9) sustainable use of the territory, 10) sustainable products. According to Andrade [1], principles of sustainability associated with urban morphology and which have been observed in spatial planning policies and urban plan of European cities were identified, to wit: 1) balance between urban development and soil conservation dedicated to agricultural and forest activity, as well as to green areas used for idleness; 2) soil conservation, of ecosystems and natural surroundings; 3) mix of urban functions and balance between housing and work; 4) social diversity in the neighborhoods and in the buildings; 5) control of moving and traffic; 6) protection of air and water quality; 7) reduction of diseases caused by noise; 8) waste management; and 9) preservation of urban groups of interest and real state heritage.
Scussel [12], when evaluating these principles of sustainability, verifies that such urban patterns have always been present as structuring guidelines of cities space. Jacobs [9] already approached that diversity is a manner to keep urban structure alive and healthy, where the neighborhood must fulfill more than one primary function, and not being allowed mastering, and that the majority of the blocks must be short, with enough amount of streets, making the turn of corners feasible. The same way, the neighborhood must mix buildings which vary in age and conditions and are dense enough, regardless the time of the day, eliminating empty areas without urban anima. We may understand then, as one of the aspects of the sustainable city, the one that well distributes urban services and equipments, promoting urban diversification. It is in this sense that the city plan must contribute, searching to fulfill its instrument of expansion direction and urban renovation, in the management of investments and in the diversified implementation of equipments. In this work, as indicators of urban sustainability, we will approach the existence of urban centralities and sub-centralities that democratize urban accessibility, diversified zonings and urban indexes which allow water permeability, air and sun in the urban fabric. Therefore, they are parameters that contribute for a more sustainable city.

2.1 Urban centralities
Urban centralities, according to Villaça [13], are centers and sub-centers (existent and encouraged), in the urban area of the city and that make part of its structure. The centers and sub-centers are understood as well distributed offer zone of urban facilities, defined by the zoning of land use which meets the community in its basic needs of work, education, business, services, transportation and leisure, democratizing the access to urban benefits and reducing the need for expensive moving and energy consumption.

2.2 Urban indexes
They are the guiding and allowable parameters of the form of construction and urban density. According to Freitas and Lombardo [7], studies on environmental quality planning bring a new paradigm of sustainable development, emphasizing what types of land use and occupation lead to different conditions of environmental comfort. In this sense, high temperatures are observed in areas where intense vertical growth, population density and small amount of vegetation is observed. To Edwards [4], the role that buildings and cities play is important to the ‘conception of sustainable planning and development.

3. Study case: Passo Fundo and its sustainable plan
Passo Fundo is a pole-city in the north of Rio Grande do Sul state, in the south of Brazil, with nearly 185,000 inhabitants. It is the second greater biomedic center in the south of the country and it has developed through the agro-industrial complex of wheat-soybean and later, because of poultry production and integrated swine [6]. In terms of logistic, the city has an important railway road connection between São Paulo and Buenos Aires, searching advantages for industrial, commercial and wholesale activities. Industry has a strong link with rural activities of the region, what has resulted in significant indexes of economic and population growth (Figure 1).

In 2006, and following the debate promoted by the City Statute, the town worked on the review of master plan 1984, activity which was achieved with the community innovative participation, which was a demand imposed by the new legislation [2]. The new master plan was ruled by the search for more social justice, balance and environmental quality for the city. This intension becomes clear when we analyze basic guidelines that guide the speech and Law nº 170/06 of the Integrated Development Master Plan of Passo Fundo, implemented in 2006 and that approaches [12]: I – reduction of social inequalities, through the offer increase of urban land, housing, sanitation, infra-structure, transportation, public services, work, income, culture and leisure of passofundenses; II – public interest supremacy over the individual interest; III – sustainable municipal and regional development; IV – participation and social control on public politics; V – municipal autonomy and federal cooperation. In article 4°, which approaches the guiding principles of local development, the social function of the property is considered the basic core of the right to property, searching fulfillment of a sustainable city by harmonizing economic development with environmental preservation, participative planning and the enforcement of social rights.
In this first analysis, we can observe that the social issue, sustainability, and the citizen participation, are factors that are observed in the public speech and in the law which governs the town.

To Villaça [13] “Decade 1990 was selected as the end of a period in the history of the Brazilian urban planning because it marks the beginning of its politicization process, result of the advance of population awareness and organization. This politicization became clear from elaboration methodologies and the content of some plans to the debates in and out the legislative, in several important cities of the country”.

But according to the author, master plans, in Brazil, have a not much encouraging history of master plans that started to be elaborated in the country from the decade of 1960, and in its majority, did not reach the objectives which they were proposed to. In certain period, plans began to work by themselves, not because of their results, working as an intellectual product mainly, out of reality, being included in the production of a huge arsenal of ideas about the city and about urban planning, and that feed on themselves, not having any link with reality.

In this context, how can we evaluate if the politic speech and guiding law of the municipal development of an average-sized city, in the country of Rio Grande do Sul, will contribute to the adequate expansion and development, implementing fairer social, environmental and urban guidelines? Through research accomplished and comparative studies of urban indexes among master plans, we could deepen this issue a little more.

4. Comparative study among master plans
4.1 Rigid zoning x diversification of land use
Master Plan 1984 recorded a well-defined Commercial Central Zone and four commercial axes that followed the main road axes of the city towards four business sub-centers, but which not contain many expansion areas of diversified use, transversal to the roads. Surrounding these business zones and axes, you went right to areas that were predominantly residential. It was a planning based on a very rigid zoning.

Comparatively, master plan 2006 expanded and changed the Central Business Zone of Mixed use, and enlarging the diversification of land use, subdivided the axes of urban expansion into two
complementing zonings: Mixed Zone and Passage Zones (Figure 2).

4.2 Inducing axes as new elements of urban dynamism
In master plan 2006, around 50 “inducing axes” are proposed, they did not exist in the plan of 1984, and that are comprised of urban plots that surround, cross or follow Mixed and Passage Zones. They are urban projections created to stimulate areas significantly inhabited, but away from the Central Zone. These inducing axes, implemented through routes where public transportation works, connect traffic and urban equipments to neighborhoods and greater centralities. Their objective is to stimulate and expand the use of diversified soil, integrating the railway system and urban functions, distributing and democratizing the access to transportation and benefits of the city (Figure 2).

4.3 Constructive indexes
Master Plan 1984 contributed significantly to the population growth and verticalization of the downtown area of Passo Fundo. The allowance of high occupation taxes, with lower pavements covering all lot, to at minimum, 12 m height, led to the lacking of minimum spacing among buildings – lateral spacing among buildings, not allowing aeration, ventilation and adequate insulation among buildings. More than that, soil waterproofing through massive construction has already turned urban drainage difficult, significatively, flooding several areas after tropical floods (Figure 3).

The lack of front spacing approached high buildings of narrow traffic routes, causing shading
for buildings and sidewalks and leading to the phenomenon of “wind tunnel”, not allowing adequate air dispersal, resulting in discomfort to dwellings and pedestrians. When comparing Master Plans, especially with respect to the central zone of the city, we may note that Master Plan 2006 proposes a restriction of the constructive indexes and rates of soil occupation. Compulsory lateral and front spacing were implemented, favoring environmental urban quality through a greater aeration, ventilation and insulation. Also, it was proposed a “Permeability Rate”, prohibiting total waterproofing of the lot through total occupation, allowing the absorption of pluvial waters inside the urban lot, avoiding erosion and damage of the heritage built (Figure 4).

Figure 4 – Schematic representation of comparative study on the occupation of lots by buildings, among Master Plans 1984 and 2006. Source: The authors ©2010, all rights reserved.

In Figure 5, we illustrate photographs of buildings in Passo Fundo through a schematic study represented in the previous image. It is recorded, in a first moment, the buildings that cover 100% of the urban lot, situation allowed in the Master Plan 1984 and which made urban drainage difficult when preventing absorption of pluvial waters from happening, among other issues. In the second moment, images obtained from buildings are recorded, one still in construction, where the effects of legislation 2006 approaches lateral and front spacing and where rates of urban permeability are already observed.

Figure 5 – Comparative images of buildings of Master Plans. Source: The authors ©2011, all rights reserved.

5 Considerations
Before comparative analysis of master plans and field survey accomplished we can conclude that the review of the master plan of Passo Fundo, implemented in 2006, tried, through its general
norms, to observe urban democracy and greater social justice by means of several norms, guidelines and indicators. This work defined and analyzed some parameters of urban sustainability, and in a comparative state, it is possible to assert that the review of the document brings proposals that qualify and democratize, theoretically, urban life. The decentralization of land use, tries to distribute urban benefits and equipments more adequately, connecting peripheral areas to inducing axes of development and sub-centralities, then approaching neighborhoods and distant poorer residential areas, from areas well provided with urban facilities and equipments.

With respect to constructive indexes, although small, there was general restriction to the built mass, in the central area mainly, already full of buildings. Frontal and lateral spacing, restricting constructive indexes were proposed and implemented. Yet, a new important rate of urban permeability was standardized and implemented, searching for a greater absorption of pluvial waters and the reduction of floods, inside urban lots, bringing in urban quality and benefits for the entire population.

Mixed permissible uses decentralize, approach and reduce distances, thus a more diversified land use contributed to a fairer, more sustainable and accessible life, not demanding much need for moving, promoting and improving the neighborhood, therefore, they will be more equipped and provided with transportation.

This way, we may assert that urban qualification of cites begins from an organized legislation in such a participative manner, which improves the diversification of urban structure and the form of the city. Then, it also necessary that this legislation is met and its implementation monitored by the organized civil society, and that this later fulfills, through its municipal council, the norms proposed.

References


