6 CONCLUDING REMARKS

In Munich dense areas, several issues and sometimes conflicting interests need to be thought in one place together: biodiversity and climate change adaptation, agriculture and recreation, transport and quality, design quality and do-it-yourself. Multiple and overlapping uses as well as temporary one at a time reclaim new strategies and tactics of cooperation amongst different stakeholders.

Munich development in coming years will show a special dynamics in the selected area by way of larger restructuring (commercial to living space) and densification (living and commercial space) activities, accompanied by substantial potentials for improving the quality of urban development. Next to energy-efficient urban redevelopment in existent buildings and new construction this includes the extension of the greenway system and the renewal of existing parks, which will contribute to better interlinking of existing and new settlement structures. There are furthermore potentials for improving the living quality on heavy traffic streets, such as Mittlerer Ring, particularly through nature-based solutions with regard to noise protection. A further goal is the maintenance and promotion of social stability in the districts through the need-based development of the social infrastructure (e.g., day care centres and schools) as well as measures for integration and education. Therefore, as stated by the Department of Urban Planning and Building Regulation of the City of Munich (2015) “the development of interdisciplinary goals and a common planning understanding for those areas as well as the accompanying integrated view and approach are of great importance” for sustainable and inclusive Munich long-term development.

BIBLIOGRAPHIC REFERENCES

Andreucci, M. B. (2017). Green Infrastructure Design. Technologies, Values and Tools for urban resilience Milan: Wolters Kluwer.

bgmr landscape architects, Freiraumstudio, Projektbüro FvBorries. (2015). Freiraum München 2030. Munich: DERetrieved from https://www.muenchen.de/rathaus/.../FRM2030_WEB.pdf City of Munich, Department of Urban Planning and Building Regulation. (2015). Munich: Future Perspective.

Munich: DE. Retrieved from https://www.google.it/search?client=safari&rls=en&q=City+of+Munich,+Department+of+Urban+Planning+and+Building+Regulation.+(2015).+Munich:+Future+Perspective.+Munich:+DE&ie=UTF-8&oe=UTF8&gfe_rd=cr&ei=LNUqWdSlJsfBXratjSg#q=https://www.muenchen.de/.../jcr.../PM_Magazin_en_web.pdf

BBSR (Eds.). (2010). Metropolitan regions in Europe. Bonn: DE. Retrieved from http://www.bbsr.bund.de/BBSR/EN/Publications/BerichteKompakt/Issues/DL_7_2010.pdf

ID 1428 | ARTICULATING NATURE, CULTURE AND URBANIZATION: AN EXPERIENCE OF METROPOLITAN PLANNING IN BELO HORIZONTE

Rogério Palhares[1]; Heloisa Soares de Moura Costa[2]
[1]UFMG/CIAUD-FAUL; [2]UFMG/ANPUR-CNPq
rogeriopalharesaraujo@gmail.com ; heloisasmcosta@gmail.com

ABSTRACT: The Trama Verde e Azul, blue and green network, or simply TVA, is one of the main territorial structuring dimensions of regional/metropolitan planning adopted for the Belo Horizonte Metropolitan Region - RMBH, Southeast Brazil. Developed as a result of a bottom up participatory planning process and inspired by international as well as local green infrastructure and river restoration programs, the TVA proposal seeks to articulate nature, culture and urbanization, through the combination of a series conservation units, open spaces, community facilities and other environmental and cultural assets, all connected by a water system of rivers, streams and lakes, and focusing on planning strategies for land use control, organic and family agriculture, ecologic tourism and ecosystem service delivery programs, among others. This paper discusses the extent to which these metropolitan planning strategies may lead to social and environment transformation towards justice, focusing on TVA implementation,

highlighting zoning categories, design criteria and other planning and community involvement programs being collectively built through a rich but very contentious combination of statutory instruments and negotiation strategies involving stakeholders, public officials, planners and policy makers.

KEYWORDS: Metropolitan Planning, Green infrastructures, Green-blue network, Belo Horizonte.

1 FOREWORD

The Federal University of Minas Gerais (UFMG) has carried out, for eight years now, an innovative experience of metropolitan planning in Belo Horizonte, Brazil, involving a significant number of faculty members, students and some independent consultants in a bottom-up participatory process that has included public officials and civil society representatives of the 34 municipalities that integrate the metropolitan region. Belo Horizonte Metropolitan Region (RMBH for the corresponding Portuguese acronym), is located in the Brazilian Southeast and is the third largest in population in the country, having 5. 873. 841 inhabitants according to 2016 latest census estimates (Figure 1).

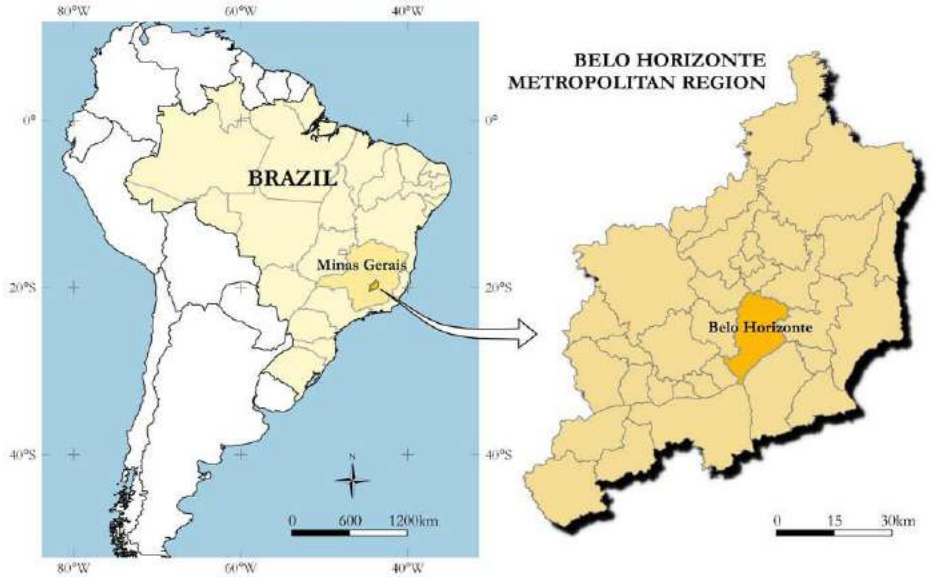

Figure 1 – Belo Horizonte Metropolitan Region in Minas Gerais State and Brazil, UFMG (2017)

This activity started as an extension project in 2009 when the University was invited by the State Government to lead, under consulting basis, the formulation of the Integrated Development Master Plan (PDDI as for its Portuguese acronym) with funds provided by the Metropolitan Development Fund[1] and authorized by the Metropolitan Development Council. Within a period of 18 months, a team of 50 faculty and 80 graduate and undergraduate students in Architecture, Geography, Economics, Social Sciences, Education, Planning, Engineering, and other related fields, developed the PDDI for the RMBH based on collected data, mapping and transdiciplinary thematic studies, but mainly on the results of a series of participatory activities such as workshops, seminars, open meetings and public hearings.

Coming from a very authoritarian, technocratic and comprehensive top-down metropolitan planning tradition, this experience has meant a shift from social reform to mobilization and social learning processes, according to Friedman's theoretical framework (1987) which have been central to bridge gaps between technical knowledge and everyday practices, aiming at the achievement of more accurate understanding of local processes, the strengthening of collective actions and the supporting of policies and

[1] This fund is the result of annual voluntary contributions of the 34 municipal members plus an equal total amount provided by the State of Minas Gerais. The Metropolitan Development Council, comprised by seven municipal representatives, five from the state executive sector, two from civil society and two from the state legislative power, is the organism that decides on priorities and the use of this funding. A complete view of RMBH's metropolitan governance structure (Arranjo Metropolitano) can be obtained in www.rmbh.org.br or and authorized by the Metropolitan Development Council. Within a period of 18 months, a team of 50 faculty and 80 graduate and undergraduate students in Architecture, Geography, Economics, Social Sciences, Education, Planning, Engineering, and other related fields, developed the PDDI for the RMBH based on www.agenciarmbh.mg.gov.br

programs that are oriented to social engagement and transformation other than to the reinforcement of status quo, hegemonic priorities and socio-spatial exclusion.

PDDI was officially launched in 2011 and starting in October 2013, the Metropolitan Macro-Zoning ordinance (MZ as for its acronym in Portuguese) was also developed under similar methodological arrangements, involving around 90 UFMG faculty and students. The MZ is considered one of the main strategies to implement the spatial restructuring of the metropolitan territory proposed by PDDI, along with infrastructure and housing investments. Currently, the same team is working on reviewing and updating eleven of the 34 RMBH's Municipal Master Plans (PDM as for the acronym in Portuguese) to match PDDI's guidelines and MZ criteria.

The participatory process for the Metropolitan Plan lasted almost two years, and accounted for around 3000 participations and 610 institutions and civil society organizations. The following Macro-Zoning development lasted 15 months and accounted for 1120 participations. Both processes involved a series of activities, which were initially geographically and thematically organized, and were progressively disciplinarily integrated both at the local and regional scales. Theatre sketches on metropolitan issues, collective mapping, a project newsletter and an internet site with permanent on-line access to all work-in-process information were some of the innovative strategies used to mobilize and involve local residents and stakeholders.

This paper discusses the planning strategies developed by the Metropolitan Macro-Zoning Project aimed to materialize the proposed PDDI spatial structure guidelines on the regions' territory. It focuses on the implementation of the Blue and Green Network (Trama Verde e Azul in Portuguese or simply TVA as for its acronym) and describes the zoning categories, the design criteria and other planning and community involvement programs that were collectively built through a rich but also very contentious combination of statutory instruments and negotiation strategies involving stakeholders, public officials, planners and policy makers within a common participatory platform meant to articulate different scales as well as metropolitan interests and local needs.

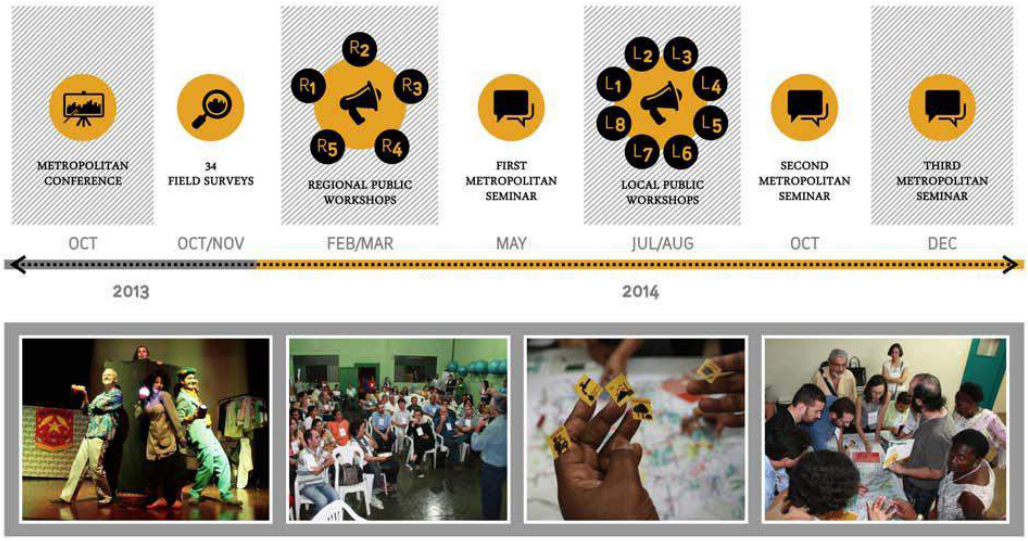

Figure 2 – MZ participatory process scheme and activities, UFMG (2013)

2 RESHAPING THE METROPOLITAN SPATIAL STRUCTURE: CENTRALITIES, MOBILITY NETWORK, METROPOLITAN INTEREST ZONES AND THE BLUE AND GREEN NETWORK - TVA

TVA was initially conceived as a background element of RMBH spatial restructuring scheme proposed by PDDI which also included a main roads and transportation system, a hierarchical network of urban centralities and specific zones and areas of special metropolitan interests, assigned for environmental and cultural heritage protection, water supply resources, food production, improved mobility and economic

development. This proposed new spatial structure has been basically meant to face historical social, economic, and environmental problems caused by the existing one-centred radial spatial structure, too much concentrated in Belo Horizonte and surrounded by extended unequipped peripheries: a spatial translation of an unbalanced and unfair distribution between costs and benefits or urban development (Figure 3). During the MZ development process, the TVA idea gained momentum from both technical and public support, becoming one of the main guidelines for the metropolitan spatial structure implementation strategy.

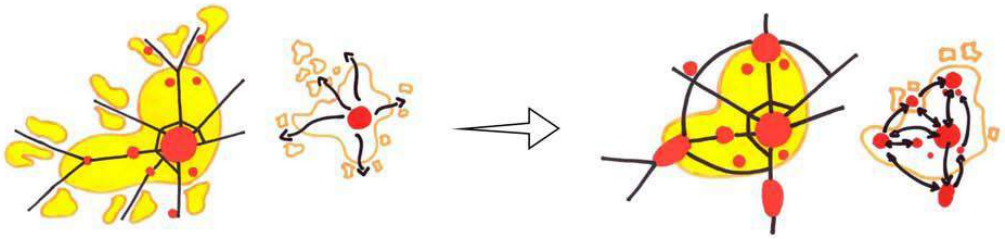

Figure 3 – PDDI spatial restructuring scheme for RMBH, UFMG (2011)

Aiming at an alternative planning strategy for the Region, Metropolitan Interest Zones (ZIM as for the acronym in Portuguese) were collectively designed throughout the Macro-Zoning project process, having their boundaries and contents justified by public functions of common interests oriented by the following main PDDI's guidelines: (1) develop existing and new urban centralities, (2) enhance economic development axis, (3) increase density in selected areas for housing and mixed uses and control urban sprawl, reducing pressure over environmentally sensitive areas and food production regions, (4) protect water supply resources and conservation areas; (5) favour the provision of affordable and social housing, open spaces and community facilities in the centralities, (6) avoid the aggravation of social spatial segregation and (7) develop strategies for the implementation the blue and green network, TVA.

This way, under an integrated participatory planning approach, involving local stake holders in the decision making process, three very strong taboos in Brazilian planning tradition have been somehow broken. The first refers to the historical split between urban development and environmental protection, seen as two incompatible motivations that usually result in conflicting regulations and policies coming from different rationalities as already highlighted in Costa (2008). The second has to do with the use of zoning ordinances limited to urban areas, leaving the rural ones unregulated, even though Federal Law 10.257/2001, also known as The City Statute, has established the obligation for Master Plans to cover the entire municipal territory[1]

The third has to do with what Fernandes (2005) among other authors call municipal autonomy at all costs that result in the lack of continuity and conflicting rules within similar environmental constraints or urban dynamics throughout different municipal boundaries, especially in metropolitan areas submitted to conurbation.

The ZIMs were subdivided into three different types according to their main characteristics and planning objectives: (1) socioeconomic development zones related to centralities and main highways and transportation axis, (2) water management zones, corresponding to water catchment areas for metropolitan supply purposes and (3) landscape protection sites and mining territories. On top of theses ZIMs, another zoning layer called Special Metropolitan Guideline Zones (ZDEM as for the acronym in Portuguese) has been proposed to address specific issues under specific policies such as central city requalification, slum upgrading, illegal settlement regularization, infrastructure upgrading, mining area rehabilitation and TVA implementation. Besides, Areas of Metropolitan Interests (AIM as for the Portuguese acronym) have also been identified throughout the whole remaining territory outside the ZIMs as privileged places for the implementation of PDDI programs, designed to encourage, for example, organic and family agriculture, ecologic tourism and payment for eco systemic service delivery (Figure 4).

[1] A research project sponsored by Ministério das Cidades, the Brazilian Federal Authority for urban development planning and policies, in 2011 evaluated, from a critical perspective, the series of recent Municipal Master Plans developed after Federal Law 10257/2001, Brazilian main reference for urban planning also known as The City Statute.

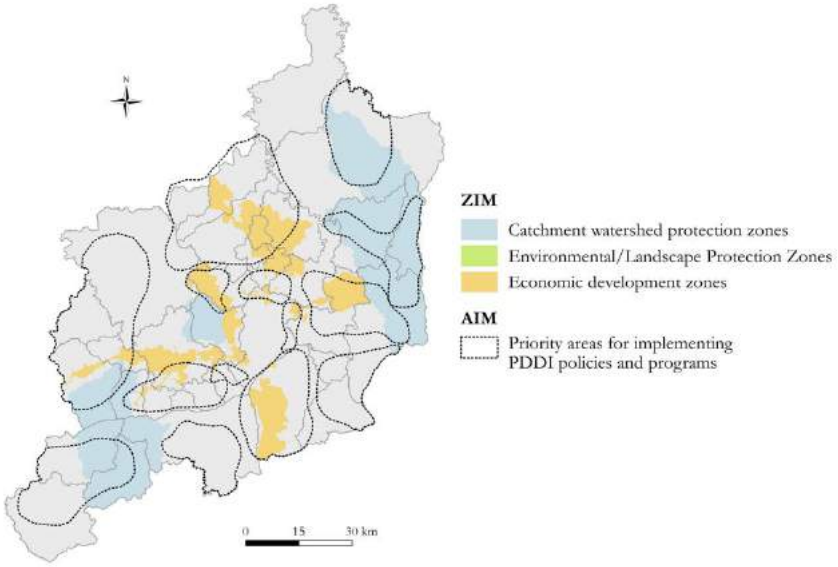

Figure 4. Zones and Areas of Metropolitan Interest, UFMG (2015)

Each ZIM has been internally divided into sub zones with respect to specific urban and environmental dynamics, resulting in different requirements for density limits, minimum lot sizes, minimum pervious surface area, height and bulk ratios and other subdivision, land use and design criteria (Figure 5).

Specifically about the control of maximum building limits per lot surface area, another vicious aspect of Brazilian zoning tradition has been broken: the mistaken merging of two originally separated rights over urban land, which are property rights and building rights, being the second the result of a discretionary act by local government according to common public interests, environmental and infrastructure carrying capacity, among other planning requirements, as a materialization of the social function of urban property as established by the 1988 Brazilian Federal Constitution[1]

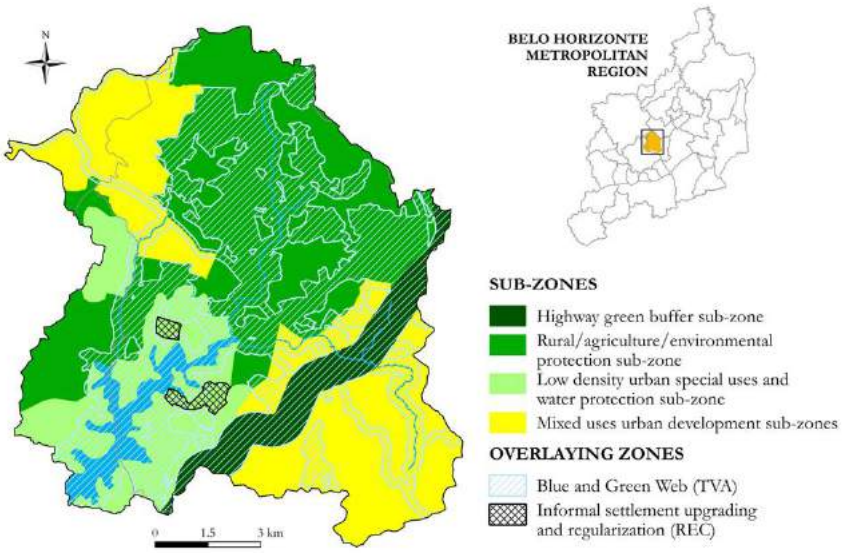

Figure 5. RMBH Macro-zoning sub-zones, UFMG (2016).

This way, according to the MZ final negotiated proposal, the general building potential for all zones was assigned as 1.0 (equal to the plot surface area) being any variation above this value subjected to planning conditions and/or payment of development rights, up to a maximum amount established for each zone. A

[1] The concept of social function of urban property, conceived as a submission of private property rights to common interests and community priorities, has been regulated by The City Statute in 2001, which assigned Municipal Master Plans to locally determine where and how within the municipal territory it shall be materialized.

similar reasoning was agreed to support for the percentage of social housing and provision of public spaces required for new development projects which, according to their characteristics, are also supposed to be submitted to environmental impact analysis and planning permits through an integrated metropolitan process.

The MZ experience has showed us that, even though the use of more sophisticated and complex instruments in planning regulation and management has been a prevailing trend to face old and new urban environmental issues, bringing social practices and regulation closer to each other seem to be a much more promising way to achieve more effective planning instruments. Avoiding marked oriented zoning ordinances which have traditionally aggravated social spatial segregation in Brazilian urban areas is a way, as Rolnik (1999) points out, of putting down invisible walls between formal and informal ways of accessing urban land, housing and a healthy environment for all.

3 TVA: AN INSPIRING CONCEPT

Over the course of planning history, many utopian models have included green spatial structures as key elements to organize urban spaces. Understanding their evolution has not only helped us realize how society's relationship with the environment has changed but it also has also inspired the search for new strategies for articulating nature, culture and urban development, as in the present TVA case study.

The origins of planned urban green facilities date back from the 18th and 19th centuries when public parks and gardens were created in reaction to the poor environmental conditions in industrial revolution cities both for recreation and aesthetic purposes (TUNER, 1998). Ebenezer Howard's garden city concept is at the base of English New Towns by Parker and Unwin, where a chain of green open spaces, parks and protected farm land formed the so called green belts involving urban areas, also as an attempt to control growth. The proposal of connecting urban parks developed by Olmstead and Vaux launched the idea of corridors integrating open spaces for natural resource protection, social use and circulation, as well as for landscape structuring, being the Boston Emerald Necklace (1895) an emblematic example.

This idea of a system of green areas and public open spaces connected by linear elements such as vegetated roads and water ways has progressively evolved to what became the green structure model from the late 20th

Green web is also a late 20 century, conceived as a strategy for territorial land use planning and environmental management (FABOS and RYAN, 2004). This approach is based on three main components: natural corridors and ecologically significant systems, parks and green axis connecting recreation areas on land or water, cultural and historic heritage assets.

th century concept that proposes the integration of open spaces by vegetated roads and infrastructure buffer zones, bikeways, bridges, waterways, parks, coast lines and all kinds of green corridors. They merge ecological and social functions, providing new green use possibilities and connecting the existing ones to enhance biodiversity and community life. The notion of green infrastructure also refers to these systems but is more commonly applied to small scale interventions such as urban green road and sidewalk side spaces, river restoration banks, flood control devices such as detention reservoirs, bio ditches and infiltration pits[1]

According to Quintas (2014) the term Urban Green Structure has first been nationally used in Portuguese planning in a central government document published in 1992 by DGOT, which is the General Authority for Territorial Management, and then, in the Lisbon Green Plan, developed in the 1993 and published in 1997. Aimed primarily at supporting the review of the Municipal Master Plan – PDM (as for the acronym in Portuguese), this plan proposed a system of open spaces, green areas and surface water bodies, encompassing both urban and rural areas, involved by a system of natural occurrences related to the

[1] For more elements on the evolution of the concept of green infrastructure, see also Thomas (2010) and Quintas (2014).

concept of continum naturalis defined by Cabral (1980) and later expressed by the 1987 National Environmental Law[1].

It resulted in a sequence of continuous and discontinuous portions of the territory recognized by their own identity given the cultural and landscape values of both urban and natural environments (TELLES, 1993). Although the "web" concept, formed by vegetated surfaces (the green dimension) interwoven by water lines and bodies (the blue dimension), is not explicit in this plan, streams and run off related morphological elements (water headboards and splitters, slopes and flood plains) are the key elements of the proposed structure merged to a cultural dimension that encompassed landscape unities and urban ensembles recognized by their genius loci[2] and areas identified as suitable for urban growth and rural activities.

Although this plan was not at that time entirely incorporated in the 1994 PDM, its main elements were present in the 2007 PDM which has been reviewed in 2012, as well as in the Lisbon Metropolitan Region Territorial Management Plan adopted in 2001 and also reviewed in 2012. It showed a deliberate attempt to articulate territorial scales (metropolitan, municipal and neighbourhood) as well as planning and project strategies to implement the proposed green structure, including design criteria and guidelines for specific site interventions. and areas identified as suitable for urban growth and rural activities.

Belo Horizonte's TVA also relates to this systemic notion of a spatial structure based on a hierarchized network of connections among green areas and water bodies, urban as well as rural, more or less anthropized, protected or still to be valued and recognized. However, there is much more to it than just ecological and functional purposes. It departs from the notion of nature as part of the process of production and appropriation of urban space and as one of the main territorial axis of PDDI's metropolitan spatial restructuring proposal, and it derives from the effort to "articulate adequate conditions of attraction and reproduction of the hegemonic productive capital – mining, property development, advanced services – with actions that reinforce, protect, and give visibility to small scale collaborative local and micro-regional activities – agriculture, crafts, services, among others (MONTE-MÓR et al, 2017).

Two other relevant planning experiences are also important to mention here as inspiring references to TVA. The first is the DRENURBS project, which has been carried out in Belo Horizonte municipality for 15 years now. It focuses on urban creek recovery through integrated interventions that include removing informal settlements from flood prone areas, housing the removed population in social housing projects as close as possible, providing sewer, drainage, solid waste disposal and mobility solutions taking the whole watershed into consideration and improving recreation opportunity and environmental management by the implementation of urban parks, erosion and sediment control devices and green corridors. In spite of its limited reach (only five of the eighteen priority catchment basins have been so far retrofitted) and recent reduction of its political support and financing capacity, it had a great impact as demonstration of alternative and more comprehensive sanitation solutions as compared to the traditional rectification and channelling of stream beds[3].

The second inspiration for TVA is the French concept of trame verte et bleu which stands for green and blue infrastructure, a network of land and water ecological continuities identified by regional ecological studies and planning documents produced by the French government, local authorities and groups of authorities and applying to the whole country territory. It includes ecological continuities, core areas of biodiversity, ecological corridors, watercourses and wetlands and contributes to improving the conservation status of natural habitats and species and achieving good environmental status for water bodies (http://www.trameverteetbleue.fr/). These principles have been increasingly adopted in European regional environmental development and recovery plans, particularly in places experiencing severe degradation such as former decaying mining areas (MONTE-MÓR et al, 2017).

[1] National Law 11/87, later modified by National Law 13/2002, or "Lei de Bases do Ambiente", is the main reference in Portugal for environmental protection in planning practice.
[2] It refers to a phenomenological approach to the environment and the interaction between place and identity as proposed by Schultz (1981).
[3] Belo Horizonte's 2011 Urban Drainage Plan has analyzed the 98 municipal watersheds and indicated the priorities for intervention in 16 of them, based on sanitary conditions, population and flood hazard vulnerability. For more information on the Drenurbs Program, its outcomes and recent pitfalls see Costa et al, 2012 and Araújo and Pinheiro, 2015.

Searching to move forward, Belo Horizonte Metropolitan Region TVA was conceived to be gradually formed by the interweaving of many complementary existing and proposed elements which can be gathered by their common nature as the following: (i) green infrastructure such as parks and other conservation areas, remaining forests and agricultural land, natural monuments, geological heritage sites, ecological corridors and other potential green areas to be protected; (ii) blue infrastructure of surface water bodies and underground water reserves, flood plains, wetlands and other relevant water resources, including the existing metropolitan water supply watersheds; (iii) cultural and natural heritage assets such as museums, cultural facilities, historical and cultural ensembles, libraries, places related to non material heritage practices (iv) places related to ecological tourism and cultural policies; (v) areas of urban ecological agriculture and small scale processing of food and crafts, among several other communal uses of the metropolitan territory; (vi) alternative networks of mobility such as bicycle and walking tracks, small roads, train corridors, pedestrian oriented roads systems, among other forms of connections.

The proposal, still to be further developed, embraces a set of principles and a general physical structure to be detailed, adapted and adopted by public as well as private social agents that produce and use the metropolitan space, establishing an increasing network of natural and built environmental collective values that articulate nature, culture and urban development (Figure 6).

As highlighted by Monte-Mór et. al. (2017), the TVA

> *"broadens the meanings of the proposed territorial restructuring associating the production of abstract space with the appropriation of social spaces at metropolitan level. As such, the political and institutional articulations to make it happen are still to be invented, but will certainly influence metropolitan and local policies. It constitutes a utopia of the future, bringing nature and culture as central to the process of production of space, recognized as a source of learning, to be appropriated and transformed by society through everyday life".*

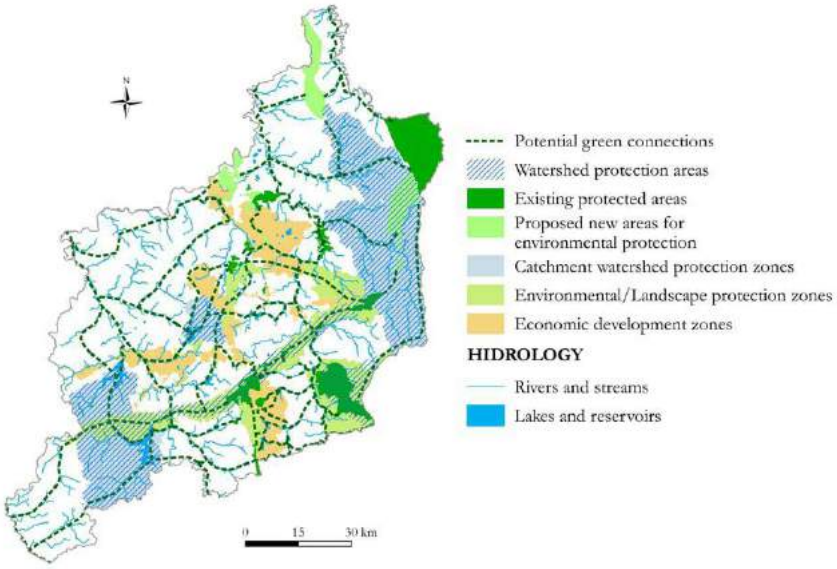

Figure 6. The TVA general scheme and elements, UFMG (2015).

4 EXPLORING IMPLEMENTATION STRATEGIES

As a view and a planning framework, a structural guidance for a future ideal scenario to be constantly searched but never necessarily completed, TVA is considered a long-term project, which requires different levels of participation and engagement, collaboration and governance. It should also count on regulatory command-and-control types of instruments as well as induced and voluntary initiatives, coming both from the public and private sectors, as well as from civil society. As far as the necessary financing, investments should come from Federal, State and Municipal government levels, but also from the private sector, civil society institutions and public-private partnership to ensure the required funds, to implement the proposed

green structure and promote a diversity of associated economic activities and, at the same time, to create opportunities for work and income generation.

The following are some implementation strategies that are already available or possible to be developed within the Brazilian regulatory framework and planning tradition (Figure 7). Many of them have been incorporated to the legislative project that is currently being discussed and negotiated to become the Macro-Zoning State Law to which all Municipal Master Plans to the 34 metropolitan members will have to conform.

i. Statutory requirements related to specific planning regulations and permits for new subdivisions and development projects such as compulsory provision of open public space, buffer zones, green areas and public facilities;
ii. Mitigation and compensation measures originated from environmental permit processes of new development projects and activities subjected to Environmental Impact Analysis: creation of conservation areas, maintenance of green spaces, adoption of environmental control devices such as green rooftops, rain water capture and reuse, infiltration pits and run off detention reservoirs;
iii. Metropolitan and municipal zoning design criteria: TVA is part of all Metropolitan Interest Zones – ZIMs which have specific parametric requirements, some specifically designed to allow for parcel based incremental green infrastructure implementation: green setbacks, minimum impervious ratio and minimum tree coverage ratio are some of them;
iv. PDDI policies and programs, especially those designed to Metropolitan Interests Zones - ZIMs and Metropolitan Interest Areas - AIMs conceived to promote small scale and family based agriculture production, agro ecologic agricultural practices, urban agriculture, food security, eco systemic service delivery payment and ecologic tourism activities;
v. Degraded mining area recovery complying to environmental legal requirements and having a social use as public facilities, parks and recreation areas, whenever possible;
vi. Cultural and landscape heritage protection, including environmental features as part of buffer zones and surroundings to the core listed assets;
vii. Public-private partnerships, guaranteed the public use of open spaces resulting from planning gains negotiated as part of each development project;
viii. Adoption of TVA concepts at different planning scales, such as the municipal level, water basin committee level, among other planning instruments and governance frameworks.

Figure 7: Examples of implementation strategies for TVA, UFMG (2016).

Besides the formal regulatory schemes and planning instruments already mentioned, which are fundamental to the continuous process of construction of the TVA, other strategies shall be added and experimented, as suggested by Cabral (2015), arisen from the articulation of the proposed structure (a political planning view) to the opportunities for action (through social mobilization, policies, plans and projects) provided by metropolitan governance within a permanent and systemic institutional design for collaborative planning.

5 FINAL REMARKS

This paper meant to discuss the extent to which metropolitan planning strategies may lead to social and environmental transformation towards justice, focusing on TVA implementation, through a rich but very contentious combination of statutory instruments and negotiation strategies involving stakeholders, public officials, planners and policy makers.

As part of a long term extension project led by the Federal University of Minas Gerais, short term political interests within four-year governmental office periods could be reduced in favour of more community involvement and a collectively built structural view for RMBH, emphasising process rather than product as a result of a metropolitan planning experience.

While the PDDI centralities network and the Macro-Zoning criteria attempt to combine land use planning with reduction of socio spatial disparities, the TVA web emphasizes a different but complementary logic that seeks to articulate nature, culture and urbanization. The discussion involved seems an important way of developing a broader comprehension of metropolitan citizenship, a concept widely applied during the participatory process, as a sense of place, a feeling of belonging to a large articulated territory, in which nature and urbanization can be conceived and experienced together. The virtual horizon orienting this planning conceptions is one in which the metropolitan area could be restructured through both TVA elements combining nature and urbanization as lived spaces, and the proposal of reinforcing a network of centralities articulated by a multimodal mobility network. The two seek to put together principles of social and economic equity, urbanity and environmental and cultural justice.

Of course such proposal represents a contra hegemonic project in a highly contested terrain, related to real estate market and land property, mining and industrial capital interest, among others which see nature – mainly land and water - primarily as an economic asset to be explored. But it is interesting to notice that during the participatory workshops where the TVA was discussed, there was widespread acceptance, even a sort of enchantment with the idea, by the participants. Although it may sound naïve, it is important to emphasize that it is only through social engagement, recognition of conflicts and mutual learning between faculty, professionals and the population that such ideas can be made possible.

BIBLIOGRAPHIC REFERENCES

ARAUJO, R.P.Z., CAMPANTE, A.L.G. COSTA, H.S.M. (2011). A dimensão ambiental nos Planos Diretores Participativos, in SANTOS JUNIOR, O.A.; MONTANDON, D.T. (orgs.) Os planos diretores municipais pós Estatuto da Cidade: balanço crítico e perspectivas. Rio de Janeiro: Letra Capital: Observatório das Metrópoles: IPPUR/UFRJ.

ARAÚJO, R.P.Z., PINHEIRO, C.B. (2015). Reflexões acerca das intervenções integradas na gestão das águas urbanas em Belo Horizonte, in XVI ENANPUR Proceedings. Retrieved from http://xvienanpur.com.br/anais/?wpfb_filepage=st4_6-01_araujo-pinheiro-pdf.

CABRAL, J.C.S.V. (2005). Inovação nas políticas urbanas – Modelos de regulação e sistemas de governança. GeoInova, No. 10 – Cidades e Habitat de Inovação. Retrieved from http://fcsh.unl.pt/geoinova/revistas/numero10.htm

COSTA H.S.M. (2008). A trajetória da temática ambiental no planejamento urbano no Brasil: o encontro de racionalidades distintas, in COSTA G.M. MENDONÇA, J.G (orgs.). Planejamento Urbano no Brasil trajetória, avanços e perspectivas. Belo Horizonte: C/Arte.

COSTA, H.S.M.; COSTA, G.M.; NASCIMENTO, N.O.; DIAS, J.B.; WELTER, M.; NUNES JR., T.T. (2012). Urban water management and planning: urban sanitation policies and an emerging institutional structure. International Journal of Water, v. 4, p. 250-269.

ELEUTÉRIO, J.; NASCIMENTO, N.; COSTA, H.; MOURÃO, A.; MALTA, G.; LEITÃO, R.; LEMOS, R.; ALMEIDA, D.; TUPY, I.; MELGAÇO, L.; ARAÚJO, F.; FARIA, D.; MONTE-MÓR, R. (2015). Conciliating urban development with water resources protection in Brazil. In Water, megacities and global change Conference Proceeding Paris, UNESCO.

FERNANDES, E. (2005). Apresentação, in: GOUVÊA, R.G.A questão metropolitana no Brasil. Rio de Janeiro: Ed. FGV.

FRIEDMANN, J. (1987). Planning in the public domain. Princeton: Princeton University Press.

MONTE-MÓR, R.L.M; COSTA,G.M; COSTA, H.S.M; Melo, M.G.P. (2017). The University and Metropolitan Planning: an innovative experience. Nova Economia, Belo Horizonte: UFMG, (forthcoming).

QUINTAS, A.V. (2014). Génese e evolução dos modelos de Estrutura Verde Urbana na estratégia de desenvolvimento das cidades, A Obra Nasce: revista de Arquitetura e Urbanismo da Universidade Fernando Pessoa nº8, Edição Universidade Fernando Pessoa, Porto, 2014, 8, p. 153-16, Retrieved from http://arquitectura.ufp.pt/docs/2014/13/AObraNasce_08.pdf

ROLNIK, R. (1999). A cidade e a lei. 2ª ed. São Paulo: Studio Nobel: Fapesp.

UFMG. (2015). Plano Diretor de Desenvolvimento Integrado da Região Metropolitana de Belo Horizonte – PDDI-RMBH Projeto do MacroZoneamento Metropolitano – MZ-RMBH. Belo Horizonte. Retrieved from http://www.rmbh.org.br/mzrmbh/

SCHULZ, C.N. (1981). Genius Loci. Liège : Mardaga.

TELLES, G. R. (1997). Plano Verde de Lisboa, Lisboa, Colibri.

THOMAS, K.; LITTLEWOOD, S. (2010) From Green Belts to Green Infrastructure? The evolution of a new concept in the emerging soft governance of spatial strategies (In) Planning Practice and Research, (2): 203-222, Rutledge.

ID 1509 | UTILIZING SPATIAL AND LANDSCAPE PLANNING TO PROMOTE ECOLOGICAL CONSERVATION ON UNIVERSITY CAMPUSES

Daniel Orenstein[1]; David Troupin[2]; Ella Segal[1]; Gili Hakima-Koniak[1]; Jennifer Holzer[1]
[1]Technion - Israel Institute of Technology; [2]Haifa University
danielO@ar.technion.ac.il ; davidtroupin@gmail.com ; israel.pistaciella@gmail.com ;
israel.koniakg@gmail.com ; israel.holzer.jen@gmail.com

ABSTRACT: Universities globally have committed themselves to behaving as responsible citizens in addressing global ecological challenges through physical planning and management of their campuses. At the Technion – Israel Institute of Technology, a comprehensive, two-year planning effort was made to revise the vision and physical plans of the main university campus in Haifa to meet emerging 21st century challenges facing the academic community. Defining and addressing ecological challenges was integral to this effort and an ecological advisory team worked closely with campus planners to envision an ecologically sustainable campus. This paper reflects upon this process, from its first stages of problem definition and goal setting, through a multifaceted ecological survey and the integration of architectural and urban planning students into the planning process, to production of the final statutory zoning plan and strategic master plan. The study highlights the particular challenges of a campus that sits on the interface between urban and natural ecosystems and one that demands rapid development with a concurrent desire to preserve ecological integrity. Conclusions highlight the universality of the ecological responsibilities and challenges that universities face, suggest general strategies for exploiting the planning process towards ecological sustainability goals, and advocate for the integration of students into campus design activities.

1. INTRODUCTION

The role of the university, as often defined in terms of its responsibilities towards larger society, is to prepare students to be socially responsible global citizens (Harkavy, 2006), to produce knowledge for addressing global social, economic and ecological (i.e. sustainability) challenges (Alshuwaikhat and