



Urbano

ISSN: 0717-3997

ISSN: 0718-3607

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Universidad del Bío Bío

Chile

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Urbano, vol. 22, no. 39, 2019, May-October, pp. 64-87

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DOI: <https://doi.org/10.22320/07183607.2019.22.39.04>

Available in: <https://www.redalyc.org/articulo.oa?id=19860787005>

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DIVERGENCES AND CONTRADICTIONS IN THE SUSTAINABLE PLANNING OF METROPOLITAN RURAL PERI-URBAN VALPARAÍSO. CASE OF THE CAMPANA-PENUELAS BIOSPHERE RESERVE, CENTRAL CHILE

I. INTRODUCTION

Chile, through a new Land Use Regulation Policy (COMICIVT, 2018), has recently changed the way regional planning instruments (IPTs in Spanish) are generated. This is with the goal of including sustainability criteria in strategic decisions from the beginning, improving planning and strengthening governance and citizen participation. Changing from the former Environmental Impact Assessment (EIA) to the Strategic Environmental Evaluation (EAE in Spanish), allows moving from having the environmental consequences of development as a core issue, to having a strategic vision of the development starting from the environmental characteristics of each area, looking to integrate the different activities and uses under a sustainable logic (Henríquez, 2018).

On the other hand, UNESCO's proposal of Biosphere Reserves is another means of land regulation which ensures the consolidation of biological diversity, the search of economic and social development, while maintaining the associated cultural values (UNESCO, 1995). Currently, Biosphere Reserves are proposed as models which harmoniously integrate human activity and nature. Today, Chile has 10 Biosphere Reserves which comprise sites of international biological interest (Moreira-Muñoz & Borsdorf, 2014) and for this it is important to ask how prepared and adapted Chile is to address the needs of environmental protection and harmonious regional planning, considering that the sustainability of an area depends on the new occupations of the population living there (cultural content) along with the strategies and regulations set out to resolve spatial conflicts and its aspired use. Under this setting, it seems fit to analyze whether the new environmental policy allows addressing the protection needs of the common property in areas with great natural value, areas which are being subjected to growing urban and agricultural expansion processes, under the context of an urban region with diverse areas of influence and strains on its use. In this way, by studying the La Campana Satellite Intercommunal Regulation Plan (PRI-LC), the coherence of the urbanistic and national environmental policy with the zoning model proposed in the La Campana-Peñuelas BR will be analyzed.

II. THEORETICAL FRAMEWORK

Current approaches to address transformation and problems in metropolitan regions are greatly guided by the conviction

that environmental planning is the approach to guide urban growth, attenuating adverse environmental effects of both the urban expansion on environmental services and of the economic activities on social segregations, and the possible effects of climate change, among others. This coincides with the current outlook where international entities champion development strategies with a territorial or geographical approach, considering the diversity of the land and favoring geographical integration and its convergence with the environmental sustainability of metropolitan peri-urban areas (World Bank, 2009 and 2005; UNDP, 2016).

Urban expansion with appropriate land use planning in the rural peri urban setting of large metropolis has consumed and transformed the critical natural resource base to maintain biodiversity, as well as the environmental services which the sustainability of these urban-rural systems is based upon (Allen, 2003; UN-Habitat, 2012; Moreira-Muñoz & Salazar, 2014; Montoya et al, 2017). In this ensemble of accelerated changes and current territorial transformations, the peri-metropolitan spaces have become highly competitive and spatially strategic areas for the future and the sustainability of cities (Salazar, 2015; Agudelo, 2012), sought after by the multiple players in the generation of new urban land, rental value and economic dynamics (Hidalgo et al, 2016; Cattaneo-Pineda, 2011; Capel, 2013). Thus, the approach of studies about the transformation of peri-urban rural spaces is focused on being able to contribute towards becoming socially and institutionally aware about conflicts in the growth process of conurbations and about the sustainable management of these strategic spaces for expanding metropolitan regions. This is particularly important in the formation of extended urban regions and the challenges this imposes on sustainability in the governance of these diffuse urbanization areas (Aguilar & Ward, 2003; Martín, 2007; Ravetz et al., 2013; Aguilar & Escamilla, 2009).

Currently, more than 80% of the population in Latin America is concentrated in cities, with the expectation that this will increase to close to 90% by 2050 (CBD, 2014). In addition, Latin America is one of the most important regions in terms of biodiversity. This is a great challenge in the diverse areas of knowledge, especially, in applied geography and environmental planning, where the generation, interpretation and management of socio-territorial information must be focused on developing sustainable urban planning which allows conciliating or responding to the needs and protection of high biological value resources amid imminent urban growth (Bailly & Bourdeau-Lepage, 2001; Salazar, 2015). In this sense, the synergy and complementarity of urban and rural lands, imposes the challenge of suitably and integrally acknowledging, the potential of each territory, given that the new relationships, interdependencies and conceptualizations between what is rural and what is urban make the traditional definitions and dichotomous categories (urban-rural and countryside-city) lose value when it comes to understanding and guiding inter-compenetration (Sepúlveda et al., 2003; Ávila, 2005; Gorenstein et al., 2007; Vanier, 2010).

However, beyond the possible and unanswerable juxtapositions between urban and rural spaces and their peri-urbanization and protection interfaces, there is clarity about the difficulties there are to refocus metropolitan peri-urbanization and reduce the levels

of incoherence in use, environmental deterioration and loss of biodiversity, among other aspects. These are the records which show the deficiencies, inconsistencies and failure of public action in terms of land regulation and urbanism and of the theoretical frameworks behind these today (Navez-Bouchanine, 2005; Capel, 2013; Salazar, 2015). In general, the social and environmental deterioration that these spaces and their community are facing as a result of the progressive generation, acceptance and accumulation of “territorial dysfunctions or conflicts” of the central conurbation are seen (Allen, 2003; Martin, 2007; Salazar, 2008; Ravetz et al., 2013). In this context, territorial transformations which appear in neoliberal models of capital accumulation must be given special attention, as they generate a rejigging of production and a concentration of the activities following decisions focused on primarily economic criteria, leaving aside the social and environmental needs and approaches which the State must watch over (De Mattos, 2010; Hidalgo et al, 2015, Panez-Pinto et al. 2018). In Chile, studies have been made about how the opening up to foreign markets brought, as one of its expressions in the country, the transformation of production methods and occupation patterns. An example, perhaps paradoxical of this, is how as a result of the pressure of property development, soils with potential for agricultural use have been urbanized, and soils without this potential, like the sides of hills, have been used for agricultural purposes (Meza et al. 2017; Salazar et al., 2015).

In the coastal context, on the other hand, the growing urbanization and property development has occurred in settings that are explicitly recognized for their environmental-heritage value, in a framework which has been defined as “the capitalist and neoliberal production of the urban space”, a well-known and apparently overriding process today in both Chile and other coastal areas of Latin America, like Argentina (Hidalgo et al. 2016). This is the case of the central Chilean coast in the Region of Valparaíso (emblematic case of the Concón Dunes), where urban planning and its “territorial or regional” planning instruments (IPTs) have planned a key role in the historic cooptation and complacency of what is an essentially urban biased planning, one with the lack of or inconsistency of the regulatory instruments which were supposed to protect the constituent elements of this land. However, their priorities are not found to be under determined protection premises in these territorial construction processes, but rather are present within the contexts where these plans are developed and the moment they come into force, both regarding the underlying processes in the area, and the challenges that are being faced, among which is the sustainability of the cities (Hidalgo et al. 2015).

III. AREA OF STUDY

The Region of Valparaíso has its main population spaces spread along its coast with the least organized centers inland. It is identified as a consolidated agroindustrial development area with complementary tertiary services, represented by a bi-oceanic corridor (Route 60 Ch) running along the Aconcagua Valley, which connects to the International Los Libertadores Crossing and the “land” ports of Los Andes.

The urbanization process in recent years in the Valparaíso Region has mainly arisen along the Trunk Corridor, favoring the reduced

travel times along the road system. For example, the communes of Olmué, Limache, Quillota and La Cruz, which are relatively close to the La Campana National Park, each has seen a population growth above the regional average, with the last two seeing a 42% increase in construction volume between 2001-2006 and 2006-2011 (Jorquera et al. 2017). In addition, there is a nodal nature of the PRI-LC area, given by the concentration and intensification of production activities along the Route 5 and Route 60 CH Corridors, and due to the nodal nature of the interconnected energy system consolidated in the sector.

This urbanizing dynamic has been forming low density conurbation systems (50 to 150 inhab/km²) which concentrate cities and residential and service activities, with fragmented disperse urban-rural occupation modalities. The latter on the margin of urban planning, which in part would be the result of a failure to update the valid communal IPTs in most of the communes (Schultz et al., 2010; Hidalgo et al., 2015), forming regional residential spaces which have a homogeneous participation of the socio-professional groups within the different population areas.

Two IPTs were chosen to understand almost the entire Campana-Peñuelas Biosphere Reserve (BR). The 2013 Valparaíso Metropolitan Regulation Plan (hereinafter PREMVAL), and a proposed but yet to be approved modification of said plan, the so-called La Campana Intercommunal Regulation Plan (hereinafter PRI-LC). This reserve, which covers 240,180 hectares, still lacks legal basis within Chilean legislation; however, its potential as a laboratory for sustainability within the Mediterranean ecoregion has already been acknowledged (Moreira-Muñoz & Salazar, 2014). The BR comprises three central core conservation areas, along with a buffer area and a transition area. The conservation core areas are: the La Campana National Park (6,000 hectares), the Peñuelas National Reserve (8,600 hectares) and the Cerro El Roble Nature Sanctuary (1,000 hectares, located in the Metropolitan Region) (Figure 1). These core areas are surrounded by a buffer area of 39,800 hectares, which itself is surrounded by a transition area of 186,400 hectares (Moreira, Leguía & Sabaini, 2016). The concrete protection levels of the Valparaíso Region’s ecosystems vary from the units governed under the regulations of the State’s National System of Protected Indigenous Areas (SNASPE) to Priority Sites for Conservation without legal basis, but with plans for their safeguarding (Figure 1).

IV. METHODOLOGY

Two types of zones were overlapped and contrasted for this analysis: (1) PRI-LC and PREMVAL, and (2) La Campana-Peñuelas BR (see figure 2). The information contained in the (1) Environmental Report, (2) Explanatory Records, (3) Zoning Plan and (4) (amended) Statutes, proposed and presented to the citizens in the public consultation process held in February 2016, were processed for the first zone. This information was used to analyze the Zoning Plan proposed by the PRI-LC, based on the uses permitted and prohibited under its Statutes, against the zoning proposed for the La Campana-Peñuelas Biosphere Reserve, and its three areas: *core*, which looks to preserve the natural habitats, with a very limited option for anthropic intervention; *buffer*, which allows the development of the agroforestry activities, without

affecting the core area; and *transition*, which allows using production activities following a sustainability approach.

The overlapping of the Regional Planning and Biosphere Reserve zoning instruments using the geographic information system (GIS) QGIS required standardizing the spatial data. In the case of the IPTs, the main variables considered in the overlapping are: the urban expansion areas, consolidated urban areas, protection areas and rural areas.

The overlapping of the information allows visualizing the uses and activities that are currently in conflict or could be, as well as analyzing the coherence of the instruments with the environmental goals and problems and the sustainability criteria (Tables 1 and 2) which are expected to be addressed. Comments and recommendations were generated for each of the areas studied.

V. RESULTS

44.8% of the Biosphere Reserves' total surface area is regulated under a Regional Planning Instrument, with 55.2% of the surface being left without an IPT regulating its use. The PRI-LC overlaps 35.8% of the Reserve's surface area, while the PREMVAL covers 9% (Table 4). The most represented surface areas are: the urban extension areas (ZEU in Spanish), with 9.6% coverage. This is very evident in the PREMVAL, in the higher parts of Valparaíso, where important property development projects are being developed, encroaching ever more into the CPBR's buffer area. The other areas which have a considerable coverage are the Rural Areas (AR LC). These areas appear in the PRI-LC with 68% of the total, considering all their systems (Table 3). These rural areas dominate in the communes of Limache, Olmué and Quillota. Inconsistencies are shown, starting from the overlapping of the IPTs and the CPBR zoning, mainly in the core and buffer areas (Table 5), given what these areas imply regarding the conservation of the existing ecosystems.

- In the La Campana National Park core area, there are 3.5 hectares of Urban Area in the commune of Olmué, while in the Peñuelas Reserve core area, 2 hectares of ZEUC-4 and 396 hectares of Rural Areas are recognized. Even so, the core area still has the highest coverage by the regulations, with 92% covered by IPTs.
- The Buffer area looks to attenuate the impacts on the core areas and has an important extension of the Rural Area, covering 85% of the surface area with regulations through the IPTs concentrated over the inland area of the Valparaíso Region in the PRI-LC, while the urban areas have a limited extension in the PREMVAL, not even covering 1%. The buffer area has a 62% coverage by IPTs.
- There is an overlapping coverage of just 36% in the transition area. This has the highest amount of surface area for urban areas and activities that are incompatible with the goals of the Biosphere Reserves. However, it must be considered that this transition area outlines the possibility of developing activities, even production activities which consider their setting; hence the relevance of the comments and recommendations being organized by commune and area in Table 6.

The territorial problems outlined in the PRI-LC Environmental Report, acknowledge the pressure on rural land (Table 2), in part due to the urban fragmentation and sprawl which shares the change in soil use. The spatial location of all the areas which have discrepancy is seen in Figure 3. It can be seen that the rural planning areas (AR-LC for example) have a higher frequency of discrepancy, compared to the other planning areas.

The occupation model proposed in the PRI-LC, allows establishing residence in rural territories (AR-LC2 Agro-residential vocation and AR-LC3 Hamlets), acknowledging the need to develop and preserve a rural culture and lifestyle, but not considering the expansion spaces of this type of residence, leaving room for an expulsion process linked to a socioeconomic segregation in spaces with great agricultural and natural value.

The Regulated Rural Areas (e.g. AR-LC), allow recognizing the high capacity agricultural lands (Class I, II and III), with a key distinction being safeguarding the economic production basis of the studied intercommunal area, which reinforces the need of a concentrated urbanization model, prioritizing urban expansion in already consolidated areas. This is more evident, for example, in the commune of Quillota where there has been a fragmentation of the AR-LC 4 Agricultural Relevance Area by AR-LC3 Hamlets, as a result of an unregulated urban expansion process around the access routes which has affected the agricultural land value.

The distinction of the different means of life and cultures associated to the rural land and new occupations allow generating conditions that will allow maintaining the characteristics associated to the rural culture and having a space which favors the permanence of the rural population.

The extension of Valparaíso's Metro System to Quillota can have two visions. On one hand, it helps transport people with less damage to the environment and as an alternative to petrol, and it also helps move more people, for studies or work, increasing the centralization that Valparaíso currently has, possibly generating a phenomenon similar to one seen in the Quilpué-Villa Alemana conurbation in recent years. The PRI's Environmental Report, blames the failure to update Communal Instruments as a key factor which has impeded the concentration of the offer of land for residential purposes inside urban boundaries.

VI. DISCUSSIONS

Strategic Environmental Assessment in Regional Planning Instruments

The incorporation of the EAE in the approval of IPTs is relevant regarding the joint work that can be done among all the players involved, and their different visions, with the goal of maintaining and preserving land with a high environmental value and vital ecosystemic service providers for the communities facing climate change. The EAE must, therefore, guarantee a process which strengthens decision-making, looking to integrate all activities and uses with the due study of risks and opportunities by those living there. It must be kept clear that

a low citizen participation is a critical element of the EAE which, as in the analyzed case, may not allow validating the procedure correctly by the citizenry, obstructing their eventual contributions or discrepancies. Timely interaction with the citizenry allows avoiding possible opposition from civil organizations, as occurred in 2014 with the modification of the PREMVAL which extended the urban development area boundaries in the communes in the northern coastal area. The citizens seeking to stop this through an injunction in the Court of Appeals, which was finally rejected.

The territory studied has diverse environmental heritage and value which currently is facing great pressure for transformation, jeopardizing the spaces that need to be protected and maintained. This is the case of the units declared as “priority sites” which are located close to or overlapping the urban expansion areas (ZEU), as is the case of the El Quiteño Estuary and the El Salto Palm Grove in Viña del Mar and Los Perales - Cerro Tres Puntas in Quilpué and Villa Alemana. Emblematic energy project proposals that have been set out go against the heritage environmental values of a Biosphere Reserve. This is the case of the Cardones-Polpaico electrical line and the planned thermoelectric power plant projected in peri-urban Limache-Villa Alemana (Paulsen et al. 2019).

In addition, currently the explicit prohibition of residential use of natural value areas seems to have not had the expected results to avoid diffuse urban expansion like, for example, residential parceling, as has been studied in the Valparaíso Region (Jorquera et al., 2017). DFL 3516 on the subdivision of agricultural land (1980) bears a great responsibility in this as, despite being revoked for the Metropolitan Regions since 2006, it is not retroactive for everything subdivided up until this date, it is part of the second home market, even in areas which currently have agricultural and natural preservation restrictions. This residential modality is the one which has transformed the structure and landscape of the region the most, based on the well-known second home condominiums, and their potential effects on the area (Hidalgo et al. 2005). The underlying land subdivision for this type of lot has been left as a legacy of the DFL 3156 and has generated a fragmentation of the agricultural value lands, leaving internationally important natural value lands susceptible to being affected by the anthropic activities in the region and in the BR areas.

On the other hand, up until now the State and its instruments, do not have territorial and environmental criteria for the authorization of land use changes through the enforcement of Article 55 of the LGUC, which has allowed the transformation of lands with important agricultural value. It is because of this that the faculties of Metropolitan intercommunal IPT are especially relevant, as this allows establishing directives to control rural territory occupation intensity by regulating subdivision. The urban planning act should change from the more traditional approaches (which insist on functionalist zoning to the generation of processes, methods, agenda and resolution of conflicts) to an approach which acknowledges different scales of players and of flexible, careful, reflective and open negotiations (Ascher, 2001), modifying the response that until today has brought greater urbanization and extended the urban boundaries, favoring the increase of urban land value (Millward, 2002).

VII. CONCLUSIONS

The IPTs analyzed slightly and superficially address the territorial issues, understood as the relationship between the setting's characteristics, the forms of governance and regional planning. The EAE which it was a part of, allows addressing sustainability within urban, agricultural and natural value land, but recognizes the lack of precision and depth on addressing the environmental problems described in the area.

44% of the BR's surface area falls under the regulations of an IPT. This means that 55% still has no type of regulation. This raises the question regarding how to address the proposed activities for this area with “a blank page”, understanding that these are also areas with a high ecological value like, for example, the priority site, Colliguay.

An important part of the La Campana-Peñuelas Biosphere Reserve (BR) is in areas with potential conflict according to the uses proposed by the analyzed IPTs and the BR zoning. Some emblematic cases are the ZEU areas in Quilpué, Villa Alemana, Viña del Mar and Valparaíso, which exercise pressure on areas with important environmental value and considered in the 2005 Biodiversity Regional Strategy as priority sites for conservation, or the AR-LC in the communes of Limache, Quillota and Olmué, which accept high impact agricultural activities and that demand a disproportionate use of the water resources. In this sense, there are also areas which are absolutely compatible with the goals of the BR, for example the AR-LC 5, 6 and 7, that are rural areas which have fragility and environmental value, considering activities related to these characteristics, very closely matching the buffer areas. Another conflict present in the area is the presence of major energy projects which go beyond the IPTs, increasing the level of discontent of the population regarding caring for the values of a Biosphere Reserve.

The regional planning at a local area must try to generate, from current instruments, along with professional and political will, use compatibilization criteria for territories with high environmental value and multiple potential uses. Urban planning is currently tied into traditional approaches and must move towards an approach which integrates different players and that is flexible, reflective and open. The peri-urban and urban-rural setup in areas of high environmental value must be governed by binding, flexible and integrated instruments which encourage the sustainable development of their areas. This makes the standardization of Regional Planning Instruments necessary in their nomenclatures and explanatory reports, procuring the general understanding of the zoning that this proposes. Regarding this, it would be very interesting to integrate the Biosphere Reserve zoning to these nomenclatures, taking advantage of the “freedom” there is to assign areas, like for example, generating urban extension areas in the Biosphere Reserve (ZEU BR) or Rural Areas (AR BR), where it is left clear that these are territories with unique characteristics around the world and that, therefore, require a particular handling of the current regulations.

It is important to incorporate the regulatory criteria upon delimiting and zoning a Biosphere Reserve. This would avoid the inconsistencies of the IPTs with the zoning, this without disregarding ecological criteria that allow visualizing other core and buffer areas which aid in the conservation of the ecosystems.

Traducido por Kevin Wright