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LIVING IN A SACRIFICE ZONE: A MULTI-SCALE ANALYSIS OF PUCHUNCAVÍ DISTRICT, CHILE

HABITAR EN UNA ZONA DE SACRIFICIO: ANÁLISIS MULTIESCALAR DE LA COMUNA DE PUCHUNCAVÍ

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RESUMEN

El presente artículo expone los impactos que el desarrollo del Complejo Industrial Ventanas (CIV) ha tenido en la comunidad de Puchuncaví, entendiendo este como origen y causa de la crisis socioambiental de la denominada "Zona de Sacrificio". A partir de autores como Lefebvre (2013) y Augé (1993) y sus planteamientos sobre la coproducción del espacio y el no lugar, se realiza un análisis multiescalar que persigue sentar las bases para la discusión y argumentación de una planificación basada en la comunidad y sus experiencias. Consecutivamente, se propone una metodología consistente en un taller participativo con miembros de la comunidad, cuyo objetivo es identificar, reconocer y caracterizar tanto el habitar en esta zona, como también los impactos que el desarrollo industrial ha tenido en el territorio. En definitiva, se observa que los actuales Instrumentos de Planificación Territorial perpetúan las lógicas de reproducción de la Zona de Sacrificio, impactando negativamente en la identidad territorial de la población de Puchuncaví, identidad que es validada por la comunidad. Finalmente, se abre la discusión sobre la necesidad de nuevas racionalidades que impliquen la revaloración del territorio, y su consiguiente reapropiación, como lógicas catalizadoras de propuestas productivas divergentes a la que hoy se encuentra materializada en el CIV.

Palabras clave

contaminación ambiental, planificación territorial, identidad comunitaria, zona de sacrificio.

ABSTRACT

This article presents the impact the development of the Ventanas Industrial Complex (VIC) has had on the Puchuncaví (Chile) community. The VIC is understood to be the origin and cause of the socio-environmental crisis of this so-called Sacrifice Zone. Based on references such as Lefebvre (2013) and Augé (1992), and their approaches to the co-production of space and non-place, a multi-scale analysis is carried out that seeks to lay the foundations for the discussion and argumentation of planning based on the community and its experiences. Subsequently, a methodology consisting of a participatory workshop with members of the community is proposed that aims to identify, distinguish and characterize living in this area, in addition to the impact industrial development has had on the territory. The conclusions reveal that the existing Territorial Planning Regulations perpetuate the logic behind the development of the Sacrifice Zone. This negatively impacts the regional identity of the residents of Puchuncaví, which is validated by the community. Finally, the article opens the discussion on the need for new rationales that imply the (re)valuation -and the consequent (re)appropriation- of the territory as catalytic logics for productive proposals that diverge from that currently embodied in the VIC.

Keywords

environmental pollution, territorial planning, community identity, sacrifice zone.

INTRODUCTION

The commune of Puchuncaví has historically been known for its fishing, agricultural and livestock activity, its slogan “where the land meets the sea” reflects its geographical condition and the historical relationship of its current 18,546 inhabitants (National Congress Library, 2017) with the territory. However, since the 1960s Puchuncaví has been involved in a context where its historical past as an agricultural, livestock, seaside and fishing zone fades due to the development of an industrial zone centrally managed by the State of Chile (Badal, 2014). The national productive project of Ventanas Industrial Complex (VIC) destroys local life in the name of development and economic growth aspirations (Shade, 2015, p. 2) (Figure 1). The historical component of environmental degradation has resulted in a constant growth of VIC and, consequently, of the externalities of its productive processes; main and most serious pollutants of the soil, water, air and land of the territory and of the precariousness of population’s health (e.g. Salmani-Ghabeshi *et al.*, 2016; Poblete, Macari and Rodríguez, 2015; González, Mueña, Cisternas and Neaman, 2008; Sánchez, Romieu, Ruiz, Pino and Gutiérrez, 1999). Due to the above is why the concept of Sacrifice Zone becomes important since, independent of its meanings, conceptually it allows to frame, imagine, identify and classify a place with the purpose of questioning perceived productive activities as destructive (Holifield and Day, 2017, p. 269).

Specifically, in that Puchuncavino context, a dystopian context with disparate national characteristics of socio-environmental precariousness, communities react through a “new eco-socio-environmental rationality founded on community and collective systems that seek to recover reciprocity and interdependencies in the relationships between nature and culture” (Bolados, 2016, p. 123). However, considering these elements as epistemologically divergent to the structuring of a Sacrifice Zone, it is relevant to ask an important question: What place do these visions have in the formal institutional context? To answer this question, this article first elaborates an introduction to the problem defined under the existence of the Sacrifice Zone. Then, the structuring elements of the current territorial planning are presented, and it is discussed how it promotes and perpetuates the existence of the Sacrifice Zone in Puchuncaví, based on a referential framework that supports the exploration of this study case based on theories about the coproduction of space.

Following Lefebvre (2013) and Augé (1993), the methodology used in the research presented here consisted of conducting a participatory and collective mapping workshop that sought to identify, recognize and characterize, on one hand, the personal experiences of the inhabitant of this area and, on the other, the impacts that industrial development has had on the



Figure 1. Town of Las Ventanas, Commune of Puchuncaví, Quintero Bay.
 Source: Photograph of the authors.

territory. Finally, it was concluded that the Sacrifice Zone uses Territorial Planning Instruments (IPT, by its initials in Spanish) as institutional mechanisms for its development and perpetuation. The non-divergence of the productive project characterized as a Sacrifice Zone manages to be explained, in part, through the observation of the investigation that manage to frame a local territorial vision that does not find room for the institutional participation of the territory, which consequently promotes, due to the productive characteristics of the VIC, the territorial devastation seen as precariousness of the population and the ecosystem that sustains it.

SACRIFICE ZONE

The existence of the Sacrifice Zone of Puchuncaví does not constitute an isolated event. In Chile, it is possible to count five of them: Tocopilla, Mejillones, Huasco, Coronel and Quintero-Puchuncaví (National Institute of Human Rights, 2018). They house 27 of the 28 thermoelectric plants in the country - 20% of the installed energy capacity (CNE, 2019) - which generate 88% of the emissions of particulate material (PM), 91% NOx, nationwide among others (Chile Sustentable, 2018). In addition to thermoelectric plants, there are other industries that increase harmful emissions for these areas, evidencing the Chilean production model based on the exploitation of ecosystems and their resources (Terram, 2016). Among the productive sectors that are implanted in these areas, the main one is mining, followed by construction (cement), port, energy (fossil) and intensive farming. The consequent environmental and social degradation of industrial production causes a latent conflict, whose problem around Sacrifice Zones is transversal to the national productive model and, by extension, to the Chilean development model.

Understanding Sacrifice Zones as products of a specific development model, allows explore its structural components and, therefore, to make visible certain concrete elements that are capable of generating, perpetuating or promoting these areas in Chile. Investigations that have explored Sacrifice Zones from that perspective, contextualize them in Latin America in a particular territorial planning framework characterized as neoliberal territorial planning (e.g. Tellez, Name and Veríssimo, 2017; Bolados, 2016; Espinoza, 2015; Shade, 2015), that is, a planning designed from market liberation logics that seeks to accentuate massive processes of industrialization of capital based on a narrative of exploitation of the comparative advantages of the country (Piñera, 2018; Bachelet, 2014). Additionally, and from a global approach, Klein (2014) explains the origin of Sacrifice Zones, also characterizing them as a phenomenon influenced by the contemporary process of globalization of capital aligned and convergent with the formal planning instruments. In the case of Puchuncaví, this has specific socio-environmental implications, those that originate and visualize in the historical growth of the VIC regulated through Territorial Planning Instruments (IPT, by its initials in Spanish).

In that sense, in the Chilean context, understanding the production of Sacrifice Zones implies, among other things, studying the institutional elements that allow their existence, in other words, the elements of the Chilean neoliberal development model that have been shown to increase the level of environmental exploitation. These elements are articulated, according to literature, through public policies that encourage the investment of capital - national and international - in extractive sectors through (environmental) regulation and IPTs that prioritize income to production (Bolados, 2016; Carruthers, 2001; Altieri and Rojas, 1999). It is in the latter that this article seeks to focus its attention given its role as trigger vehicles of urbanization and globalization processes of the territory that are decisive for the industrial sector and, consequently, also determinants in the socio-environmental conflict of Puchuncaví as a Sacrifice Zone. Specifically, this article will explore the problem around IPTs as bridges for a specific vision of the territory that has managed to reproduce for 60 years the socio-environmental degradation in Puchuncaví.

On one hand, the State through territorial planning responds to the logic of the market, allowing the installation of companies and the environmental degradation of the territory where they are installed over the care for the ecosystem and the communities that inhabit it. The consequences of environmental impacts do not distinguish social classes, as Svampa and Viale mention, it is the vulnerable sectors of the population that suffer the most disproportionate environmental damage (2014, p. 83); impacts that, in the world of the economy, are considered as negative externalities



Figure 2. Territorial Planning Instruments Scheme. Author's elaboration based on IPT Scheme. Source: PRO-City Consultancy firm.

of companies. On the other hand, it is important to emphasize that the problem of environmental injustice related to Sacrifice Zones is an irrefutable fact and lies in the state of current Chilean environmental legislation (Infante, 2016), whose regulatory instruments applicable to different scales of the territory are still in a very incipient state regarding the inclusion of participation in decision-making, opposition and negotiation by vulnerable communities to influence current IPTs. Therefore, today these instruments favor the environmental devastation and the violation of the fundamental rights of inhabitants living in poverty and extreme poverty in vulnerable territories.

LAND USE PLANNING

The Territorial Planning Instruments (hereinafter IPT by its initials in Spanish) (Figure 2) have an order of hierarchy among themselves, which will define the range of action they may have in the territory where they are located. What defines the IPT are the zoning - in the case of major instruments, it will be "macro-zoning" - through which land use is defined and, therefore, what can or cannot be developed in place; whether they are industrial, residential projects, green areas, etc.

The IPT applied in the Commune of Puchuncaví are the following:

1. Valparaíso Metropolitan Regulatory Plan (PREMVAL)
2. North Shore Satellite Regulatory Plan (PRI-ZBSCN)
3. Puchuncaví Community Regulatory Plan (PRC)
4. General Ordinance of Urban Planning and Construction (OGUC)

CO-PRODUCTION OF SPACE

Lefebvre (2013) states the concept of space has been defined from different areas of knowledge (geography, economics, demography, sociology, ecology, politics, commerce, etc.). In the field of urban planning and architecture, space is regulated through various planning policies and instruments established by the ordinance and laws (Infante, 2016), which, in turn, determines the construction of the spaces we inhabit.

Lefebvre defines three spaces related to who inhabits it: the mental space, referred to formal logics and abstractions; the *physical space*, practical, sensitive and the perception of nature; and the *social space* or the space of human interaction. The *social space* is produced on different scales by state social and political forces, it is multiple juxtaposing and interpenetrating. It is an abstract space of property and economic development, which relies on vast banking, commercial and industrial networks part of an economic and productive network that fragments work. This abstract space has been superimposed on the previously constructed space, space of those who have inhabited the territory, thus being forced to live under a system that develops projects in pursuit of a global economy, making invisible or eliminating the local economy.

One of the components of this economic network is the industrial estates, areas that for the purposes of this research have been categorized as non-places (Augé, 1993). In opposition to the *anthropological place*, *non-place* is defined as a space without identity, without relation and without history. The industrial estates are *non-places*, impersonal, not appropriate, where alteration is not possible because they are spaces of mere transit, where feelings of belonging and relationships with other subjects that are also passersby can hardly be generated. But the possibility of *non-place* is always present in any *place*, since both intertwine and interpenetrate.

The dissociations between multiple spaces that coexist in a *place* and *non-place*, in the case presented here, between the space of the industrial estate and the space of everyday life, can be analyzed through the *transduction* of Lefebvre, an intellectual operation that seeks understand reality by facts and its possibilities (Lefebvre, 2013, p. 97). *Transduction* is proposed from three types of space: the *space produced*, which corresponds to abstract constructions and imposed techniques; the *lived space*, subject to abstract constructions and symbols; and the *perceived space*, referred to daily practices and as a link between the two spaces mentioned above (Harvey, 1990). In this way, the subjective and imaginative dimensions would be incorporated into the urban and territorial analysis (Lindón, 2007). On the other hand, Gudynas proposes a

social ecology and proposes “an articulation between different forms of knowledge, including sensitive or subjective experiences. The different perceptions and valuations of people about their environment can add to each other, appealing to interactive meeting and dialogue procedures” (Gudynas, 2004, p. 129) to define in a more concrete and Latin American way the abstract spaces of Lefebvre.

METHODOLOGY

METHOD

The study revealed that to understand inhabiting in relation to industrial development it is necessary to use a mixed methodology. To analyze the process and delimit the study to the urban and architectural area is why study variables are sought that, from a quantitative perspective are associated with specific data and, from a qualitative perspective, with information derived from the voices inhabiting the territory in study. From an integral logic, in the sense of assuming contextual reality as a complex, diverse and dynamic field of study, methodologies complement each other.

STUDY PER SCALES

The research aims to link the study of industrial development with communal development. Within this framework, the impacts on living are defined by systematizing the approach to reality on three scales: MACRO-Scale, MESO-Scale and MICRO-Scale, which respond to the three spaces proposed by Lefebvre in the theory of *transduction*. Each scale was associated, in turn, with a Research Instrument, the MACRO-Scale, with the bibliographic search in relation to Territorial Planning and Pollution (Community level linked to the space produced); the MESO-Scale with a designed activity called Collective Model/Mapping (Community level linked to the lived space); and the MICRO-Scale with individual questionnaires (Individual level linked to the perceived space). Specifically, for each scale we work with specific groups in terms of the number of people: for the MESO-scale we worked with two groups of 10 people with key informants among them, and for the MICRO-scale a questionnaire was applied to 83 people, for the socio-environmental diagnosis we worked with groups of 10 people from 4 different rural schools, among them, “La Quebrada”. In this publication in particular the MESO-Scale will be presented in detail.

OBJECTIVE OF THE INSTRUMENT

The objective of Collective Model/Mapping is to build the sense of communal living from a collective perspective based on territorial recognition and communal economic development.

Along these lines, a methodology consisting of a territorial recognition of anthropological sites was developed, followed by the description of communal development (past-present, productive activities) and, finally, the study of *non-place* (Augé, 1993). In relation to non-place, the Iconoclassist Collective Mapping Guide (Ares and Risler, 2013) was used, rescuing part of the proposed symbols for the activity and recognizing the impacts caused in the territory by industrial development.

The activity consists of three parts described below.

1. Territorial recognition

At the beginning of the workshop, a cartographic exercise was proposed consisting of each participant identifying and placing on a map of the territory their areas, spaces, routes, places, itineraries and all the places they like and also the places that cause distress and discomfort. The sum of them shows how each individual defines and characterizes the territory that will then be mapped collectively (Ares and Risler, 2013, p. 20).

[STEP 1] *Approach to the Model*. Locate their place of residence and a significant place in the commune (each participant).



[STEP 2] *Geographic Milestones*. Based on geographical milestones that Augé proposes the territory is characterized through the identification by the participants of the points linked to the following milestones:



2. Communal development

[STEP 3] *Productive Activities of PAST* and [STEP 4] *Productive Activities of PRESENT*. The second part is a comparison between what the commune was and what it is today, for which the participants are presented with productive activities previously identified, and the following files:



3. Non Place

[STEP 5] *Negative Impacts of Industrial Development*. It is proposed to study the impacts that industrial development has had and present the possible impacts that it has had on the commune. Impacts are identified with the following icons:



ANALYSIS METHODOLOGY

The *Collective Model Instrument* was analyzed quantitatively and qualitatively. The first analysis considered three steps: 1. Transcription of points and routes resulting from the activity from the model/base drawing to the communal drawing (maintaining the amount and position of the points indicated) (Figure 3). 2. Accounting of points (Figures 4 to 10) and compilation in tables to quantify what was obtained. 3. Determination of areas that involve the points indicated by layers.

On the other hand, the qualitative analysis considered the transcription and analysis of *Field Notes* based on the record made of the activity and classification of the participants' accounts, giving an account of their perceptions of living at the time of placing the proposed points. This activity was carried out in three categories: territorial recognition (anthropological place), communal development (productive activities) and industrial development (non-place). The following section includes literal transcripts of the most relevant stories expressed by the participants.

The activity described was applied in two different contexts; the first in the framework of the research

that originated the design of the activity¹, in which the commune was analyzed through the communal model with two groups of 10 people each. In a second instance, it was applied to the Socio-Environmental Diagnosis of the local environment within the framework of the Certification Process for the Sustainable Schools Seal of the Commune of Puchuncaví, where places where the schools are located were analyzed².

RESULTS AND DISCUSSION

The results obtained in both activities, according to the stages defined in the methodology, were compared with the objective of highlighting the repercussions on the perceptions of participants.

TERRITORIAL RECOGNITION

Based on Augé's (1993) theory of anthropological sites, participants identified their place of residence and significant places [STEP 1], making a first approximation to the model/mapping in order to locate geographical landmarks corresponding to the territory of analysis [STEP 2].

The answers obtained regarding territorial recognition were accompanied by explanations of the participants about the attachment and valuation of the territory, in which links from individual and collective memory were seen. The significant places identified were related to: the memory, the beauty of the place and the valuation of the flora and fauna existing in the commune. Next, quotes from the participants that reflect the aforementioned are cited: "Las Caletas, I come from a family of fishermen, and it is heritage that is forgotten", "Los Maquis Town for family history, upbringing and all life there"; "Las Ventanas, beautiful place to walk near the house".

Geographical milestones [STEP 2] identified allow us to account for a territorial assessment at the locality level, in which the quantity and variety of points located are highlighted, in addition to the essential aspects of living in relation to daily life and the collective imaginary. This makes it possible to recognize in the results urban design lines capable of evidencing potential productive possibilities of the local economy and, therefore, of an endogenous nature, linking them to urban planning that includes living and daily life as the basis of communal development.



Figure 3. Collective model register. Source: Photograph of the authors.

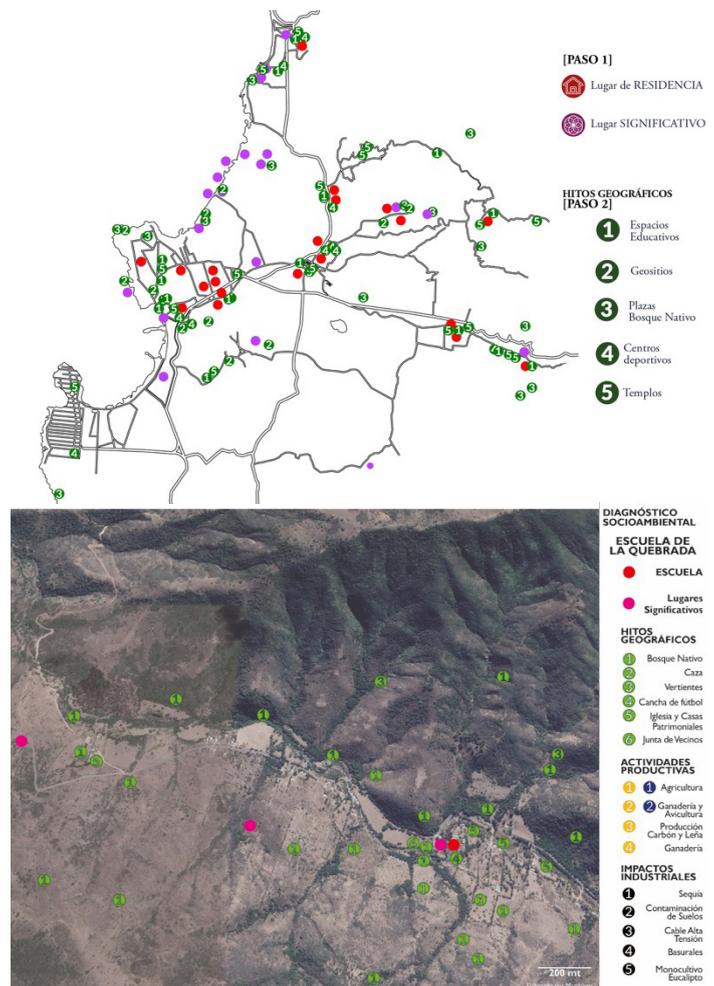


Figure 4 and 5. Steps 1/2. Collective Modeling - Commune of Puchuncaví. Source: Authors' elaboration.

[1] VERGARA; Magdalena, *Harm in the Commune of Puchuncaví: territorial crisis*. Undergraduate thesis, UTFSM, Valparaíso, 2019.

[2] This diagnosis was carried out in conjunction with the Poverty Overcoming Foundation, together with the NGO Puchuncaví Nativo and backed by the Illustrious Municipality of Puchuncaví, as a field activity carried out during the thesis process (idem).

COMMUNAL DEVELOPMENT

[STEP 3] Identification of productive activities of the past.

Continuing the methodology with [STEP 3], participants described the past as a time of productive abundance, recognizing a common territorial identity, based on productive activities that created closeness and relationships between localities, linked territorially and geographically. These activities were part of the daily life of those who inhabited the territory due to practices related to them, i.e. threshing, drove of cattle. Thus, for example, it was reported: "Until 1971 it was produced in industrial quantities (bags of lentils, peas, beans and wheat); "Formerly in the afternoon animals were part of the routine, they returned to the houses so the roads were filled with them."

Comparatively, the development of VIC has been accelerated in relation to community development, with a different dynamic, which led to a deterioration of the environment in the commune. This has affected productive activities that connected the different localities, thus affecting the territorial identity at communal level (territorial fragmentation) and the inhabiting (daily life), which can be seen in the testimonies that follow: "With the installation of the first stack the released smoke was trapped in the valley and all locations were dying, it was filled with blue smoke"; "With the arrival of the industry, fishermen did not want to work in the industry because they earned more at sea, over time they ran out of resources"; "Until the 70's farmers could not grow more (Maitenes)".

[STEP 4] Present productive activities

Although both agriculture and livestock and fisheries declined significantly throughout the commune, today they are still practiced in smaller enclosures and close to localities, as noted in the following three accounts of the participants: "It is a mistake to say that agriculture is dead"; "Climate process added to the industrialization process has been a sum. There is no water to irrigate, even if there were no industries, there is no water for irrigation, so we could not have the same level of production that we had before"; "Last data from PRODESAL (cattle ranchers), 17,000 head of cattle (throughout the commune) were counted, before there was twice as much."

NON PLACE

When comparing productive activities of the present with the impacts of industrial development, we can see how they threaten what exists now, spread throughout the territory (Figures 6 and 7) covering the largest area of all locations. For this reason, some icons were not placed on the model, due to the generalization at

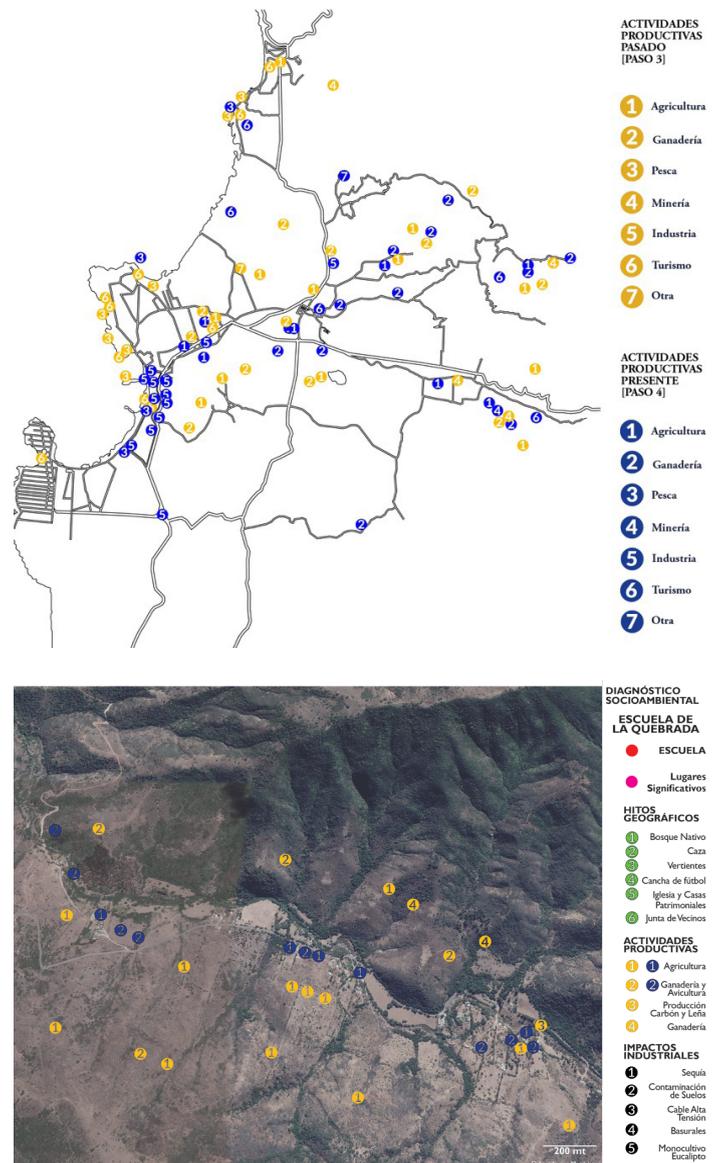


Figure 6 and 7. Steps 3 and 4. Productive activities of the past and present. Source: Authors' elaboration.

communal level of air pollution and drought, as one of the participants clearly states: "the entire model should be filled out because everything is contaminated, where you go in the commune there is pollution."

Agriculture and livestock, symbols of territorial union between localities, decrease significantly due to the negative externalities of industrial development, segregating the localities of the commune and reducing productive activities to populated centers. These impacts irreparably damage the environment, which affects the symbols and images that define the lived space and the territorial identity, consequently, the social space. The passively experienced space is defined by this absence of communal identity, as a result of the Sacrifice Zone, which in turn perpetuates a social-environmental crisis (Figures 8 and 9).

Regarding community development, there is a lack of basic urban services, a basic need of the inhabitants that is not covered, which reveals where urban development points and the IPTs that privilege industrial development over integral communal urban development. This is precisely stated by another of the participants: "There is a problem in politics, instead of worrying about producing water for human consumption, there is concern for industries, so they are not compatible, water resource is clearly scarce."

CONCLUSIONS

The space is produced under certain canons that respond to a cultural and economic model of society. The national State has been consolidating worldwide, organizing and rationally planning society, imposing homogeneous measures, whatever the political ideologies, the historical past are or the social origin of the individuals in power have. The impact of these state decisions on a capitalist neoliberal system such as Chile has an impact on all scales: global-planetary, continental, national, regional, communal and individual.

IN RELATION TO TERRITORIAL PLANNING

Industrial development, based on IPT, has violated for decades the daily lives of those who inhabit the Sacrifice Zone, privileging the national/global economy over the local economy, through the indiscriminate growth of VIC and its consequent environmental and social damages. The commune of Puchuncaví is a sample of what happens at country level, with the different Sacrifice Zones, which are planned and perpetuated through the current IPTs, at the service of the centrally and hierarchically directed economic model, which ends forgetting the inhabitants of the place within the urban planning, leaving the entire local ecosystem subdued, damaged and sacrificed. In that sense, the collective model allowed to demonstrate through the characterization that participants (30 people in three activities) carried out, the position of the town in front of the VIC as a non-place, as an agent external to local issues that promotes an economy based on socio-environmental devastation.

IN RELATION TO TERRITORIAL IDENTITY

The impacts of industrial development on inhabiting and on the population are related to an accelerated deterioration of the territory in question, which has an impact on collective memory and, consequently, on territorial identity. The analysis instruments used prove that what VIC produces (or this type of development) is a territorial disorientation in the individual, due to the loss of territorial identity based on abundance, in the sense of constituting an image that is verbalized as "an abundant past" and a current "shortage". Those who participated denoted a territorial conscience, but the new identity imposed by the Sacrifice Zone suggests that everything is deteriorated so there is no

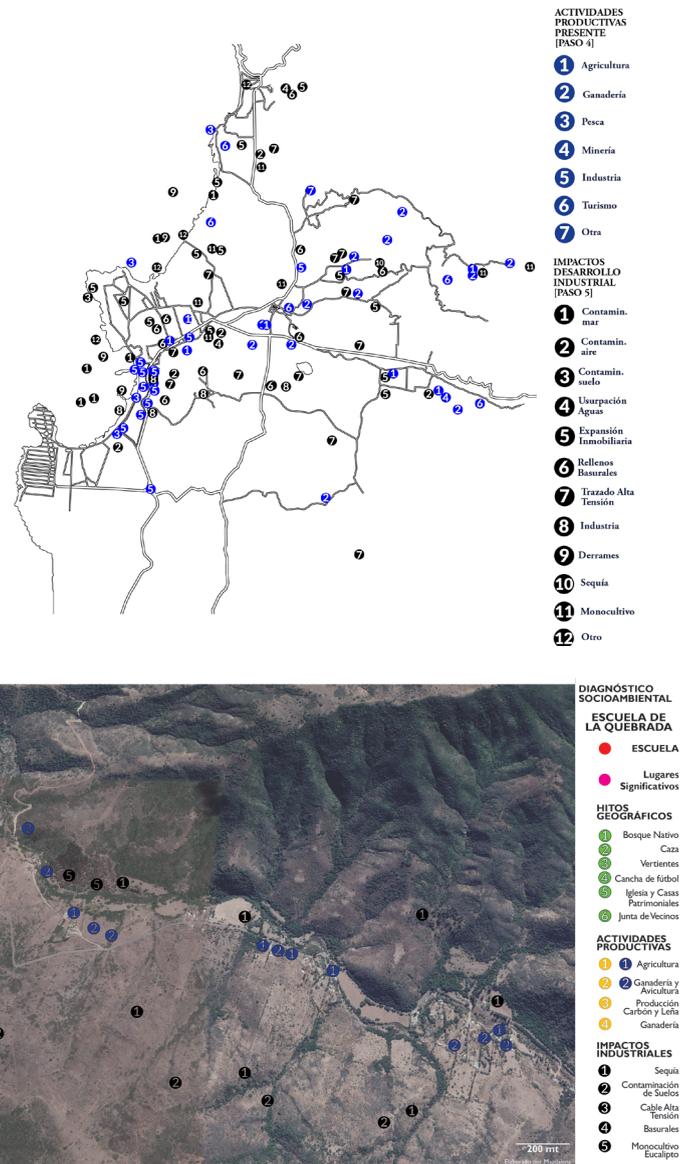


Figure 8 and 9. Step 5 and 6. Negative Impacts of non-place (black) with productive activities of present (blue). Source: Authors' elaboration.



Figure 10. Image of the collective modeling. Source: Photograph of the authors.

knowledge of what still resists, as Augé states: "No longer a genesis but the decoding of what that we are in view of what we no longer are" (1993, p. 32). Non-place reveals the emergence of a new identity based on deterioration and pollution, leaving the Sacrifice Zone validated and, at the same time, resisted by collective consciousness.

IN RELATION TO TERRITORIAL RE-APPROPRIATION

Territorial appropriation implies a new rationality from the reevaluation of the territory, which has been deteriorated, but still retains attributes described in the instruments. Collectively visualizing the current situation of the commune is of great importance for the transmission of knowledge about the commune and its localities to new generations, so that they can revalue the territory and raise awareness about these attributes that the commune has with a view to strengthen territorial identity, which entails the reconstruction of a territorial identity, therefore, a new territorial rationality. Identifying perceptions in the MACRO and MICRO scale can help establish a broader perspective on this issue, as well as identify forms of organization that allow articulating projects that develop a transition to more socially inclusive, environmentally more sustainable and economically more inclusive systems. Finally, coinciding with *social ecology*, it is more successful for our Latin American reality to set sail from the commitment to life, despite not fitting precisely with the method of scientific practice (Gudynas, 2004).

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