

Co-naturing informality in Chile

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Abstract

Inspired by Donna Haraway's concept of Making Kind, the investigation of the relationships between different objects of nature and non-nature subjected to today's climate change is born. Looking today at the transformations of the planet, Chile represents an exemplary case study. Within its particular geomorphological condition, it is impossible to exclude the continuous evolution separating humans from other living species. This integration is the rise of campamentos, Chilean informal settlements. This contribution investigates the natural processes and informality in Chile through the lens of Landscape ecology. Specifically, it analyses the symbiotic relationship between the informal development and the morphological conformation of the natural Chilean context, with the consequent intersection of the inhabited space and the natural one.

Ispirandosi al concetto di Making Kind di Donna Haraway, nasce la ricerca delle relazioni tra i diversi oggetti della natura e non, soggetti ai cambiamenti climatici di oggi. Guardando oggi alle trasformazioni del pianeta, il Cile rappresenta un caso di studio esemplare. All'interno di questa particolare condizione geomorfologica, è impossibile escludere la continua evoluzione che separa l'uomo dalle altre specie viventi. Questa integrazione è rappresentata dalla nascita dei campamentos, gli insediamenti informali cileni. Questo contributo indaga i processi naturali e l'informalità in Cile attraverso la lente dell'ecologia del paesaggio. Nello specifico si analizza il rapporto simbiotico tra lo sviluppo informale e la conformazione morfologica del contesto naturale cileno, con la conseguente intersezione dello spazio abitato e di quello naturale.

Keywords

Nature, Process, Landscape, Ecology, Masterplan, Chile.

Natura, Processo, Paesaggio, Ecologia, Masterplan, Cile.

[Extreme] nature of informal Chile

Since we are living in the Anthropocene, there is no doubt that Climate change is human driven, but it is equally necessary to clarify that “There is a political difference between saying” Humans did it! “ - and saying, “Some humans did it!” (Moore, 2021, p. 50). Thus, we face a global asymmetry: climate change triggered by consumption patterns accelerates the processes of exploitation. Here, the environmental crisis becomes extremely tangible, increasing the weight of inequalities (Olivari, Li and Huang, 2021). In this context of climate change, it is necessary to start re-questioning and re-thinking the relations between humans and non-humans. Inspired by Donna Haraway’s concept of Making Kind (Clarke and Haraway, 2022), the research on the relationships between different objects of nature and non-nature that are subject to today’s climate change is born.

Looking today at the transformations of the planet that are afflicting more parts of the world’s population, Chile represents an exemplary case study. Chile is characterised by natural phenomena of endogenous nature, and it has such a conformation that the topography itself becomes an urban fact: social, spatial, cultural, and architectural relations are deeply and intrinsically linked to the territory. Most of Chile’s boundaries are marked by natural

barriers: for example, mountains, that isolate the country as an island from the rest of South America. To the north, the Atacama Desert separates Chile from Perú while also being surrounded by the Pacific Ocean to the South and West. To the East, the Andes chain constitutes a natural barrier between Chile and the rest of South America.

Besides being naturally isolated, Chile is characterised by an endogenous nature: earthquakes, tsunamis, and fires are natural hazards, made even more extreme by the increasing overexploitation of its resources. In these areas, where the risk and nature become extreme, there is a co-habitation between man and nature. Within this geomorphological condition, it is impossible to exclude the continuous evolution, separating humans from other living species. This co-habitation is the rise of *campamentos*, Chilean informal settlements: as in the ravines of the region of Gran Valparaíso, subject to landslides, earthquakes and fires, there is the greatest concentration of *campamentos* of all of Chile; and as in the desert regions of Atacama and Antofagasta, where the presence of water is almost nothing; here, only the informal element can rise (TECHO Chile, 2020). The natural conformation of the Chilean territory still partially manages to preserve the Chilean land from urban disfigurement. As the native indigenous populations in this area lived precariously and in con-

tinuous movement depending on the fickleness of nature; so, the informal element carries an awareness of its temporariness. Consequently, daily, the informal element must deal with its instability.

This contribution investigates the natural processes and informality in Chile. Specifically, it analyses the symbiotic relationship between the informal development and the morphological conformation of the natural Chilean context, with the consequent intersection of the inhabited space and the natural one. The spatial interaction between the natural context and the informal advancement is extreme in Chilean territory (Olivari and Pasquali, 2019).

Nature as a gradient of interventions

Already in the past, the concepts of co-habitation and co-evolution of humans with nature had been the basis for the evolution of our Earth. In fact, Ellis says that “Long before the rise of industry, even before the rise of agriculture, human societies began transforming ecosystems to support their populations and sustained these processes for thousands of years in some regions” (Ellis, 2014, p. 21).

Even the predecessors of the *genus homo* used more technological tools of natural origin to extract more nourishment from landscapes to sustain populations. In this regard, the evolution of this knowledge has allowed socio-ecological capital to be accumulated over generations and has allowed a single species to transform an entire planet (Ellis, 2014).

Speaking about the concept of co-habitation with nature, there is the idea that nature often needs to be preserved in its intact fragility through protection (Cronon, 1995). The concept of co-evolution, thus, approaches the idea that even nature, per se, would not even exist for it is an ambiguous cultural construction.

The paper proposes to reconsider nature through a new lens in which culture and nature are no longer in opposition but co-inhabit the same space. The research proposes to reconsider informality through a

new vision in which culture and nature are no longer in opposition (Olivari, Li and Huang, 2021). The goal is to re-establish a relationship of reciprocity with nature, coexistence, security, and justice in the world that encompasses both.

Today the climate emergency makes new demands on land. The eroded soil is the principal driver of fires, landslides and even flooding, but how the land is managed can be an extremely important catalyst. The productive landscape has progressively shaped the land, through urban development, soil erosion, deforestation, overgrazing, and natural channelisation of wind that combined have worsened the fires and landslides problem. Current awareness of climate change has highlighted the importance of these feedback mechanisms that shape landscapes, in which human and nonhuman acts are mutually related. Productive cultural landscapes thus offer a specific cohabitation model for understanding the intermingling of nature and culture as well as ecology and economic science (Olivari, Li and Huang, 2021). This inclusive model becomes a new instrument for ecological investigations and innovative management methods about informality. The research thesis examines alternative spontaneous settlements in Chile; whose goal is to demonstrate that the natural context becomes an essential dynamic resource in the co-evolution processes. Currently, Chile is influenced by several climatic factors that generate negative changes in the water environment causing drought and low humidity. Intensive exploitation of agricultural land and increasing urbanisation has made the soil surface less permeable. In addition, this is the threat of a future shortage of drinking water, increased by the current inefficient management of water from rainwater that is avoided and directed towards the sea. So far only 4.2% of surface waters are dammed and the rest reaches the sea. In this regard, the soil is eroded, arid and depleted by intensive cultivation, often due to the chemicals used. This phenome-



Fig. 1 - Informal settlement in Punta Arenas, Chile (photo credits: the authors).

non not only affects land management but also increases the risk of loss of biodiversity: the natural system consisting of areas of high ecological value is greatly threatened by the unstoppable growth of exogenous species such as pine (*Pinus radiata*) and eucalyptus (*Eucalyptus globulus*). The introduction of this is a potential risk factor because of its high combustibility and low moisture retention at ground level.

In addition, wastage of important existing water resources is often caused by fires, for which a better understanding of the risk factors that promote their spread is needed (e.g., temperature 30 Celsius degrees combined with 30 knots of south-westerly wind and a drastic decrease in the humidity of up to 30 per cent create high vulnerability).

Dynamic master plan as a project

In response to the endemic problems, the contribution looks at alternative methods to tackle the Climate Change consequences. The goal is not to offer a one-way strategy that does not consider the complexity of the landscape, but rather to imagine a gradient of alternative strategies. The strategy proposed doesn't refer to pouring more concrete fire defences, protecting burned areas, or dredging channels. Instead, must be reconsidered the indigenous and informal land use and management approaches. It is necessary to carefully consider the whole catchment area from a wide perspective: from the physical network (terrain, soils, vegetation, minerals, among others) to the social, cultural, political, and economic factors that govern land use, management, and ownership. This integrated approach would unveil the eco-logics. The complexity of the ecological and informal processes challenges the static, fixed and two-dimensional vision of nature. The planet is in motion; therefore, also the boundaries that cross it must be recast as dynamic, not static, changing and even indeterminate processes (Olivari, Li and Huang, 2021).

This process acts through a model in continuous evolution. The expected result is an endogenous strategy that avoids the risk of superimposed interventions. For this reason, a non-invasive and sustainable infrastructure model is proposed (from the point of view of nature, economy, and social invisibility), capable of entering the territory and environmental and ecological processes. It is not a definitive solution but rather an open process: a strategy-process, which is based on complexity, multi-scale and mobility. More specifically, this model is constituted by a correlation of nine different strategies. These are design open models, suitable to intervene in the local context. They work in coexistence with nature by creating new indirect relationships. The first three strategies act on the territorial scale and are:

- ecological hotspots in burned areas (strategy 1): reintroduction of native trees "resistant" to re-starting from the burned areas: areas affected by the territory in which the vegetation is highly deficient or almost absent. Starting from these ecological hotspots it is possible to establish a resilient growth of vegetation;
- resilient restoration of biodiversity (strategy 2): implement an ecological restitution methodology from the gradual symbiosis of exogenous vegetation (*pinus* and *eucalyptus*) with the native (*boldo*, *liter* or hawthorn);
- symbiotic graft of native vegetation (strategy 3): the forest clearings are spaces or pauses existing in the plantations, like plant stains. They are made with the aim of permeating light and reducing the density of introduced plant material, which generates more controlled growth and a gradual change towards native vegetation.

The other six strategies act from the global to the local, through an urban acupuncture: recycle of sewerages (strategy 4), lighting system (strategy 5) and aqua punctures (strategy 6) (Lerner, 2014); colours (strategy 7); void as visual ecology (strategy 8)

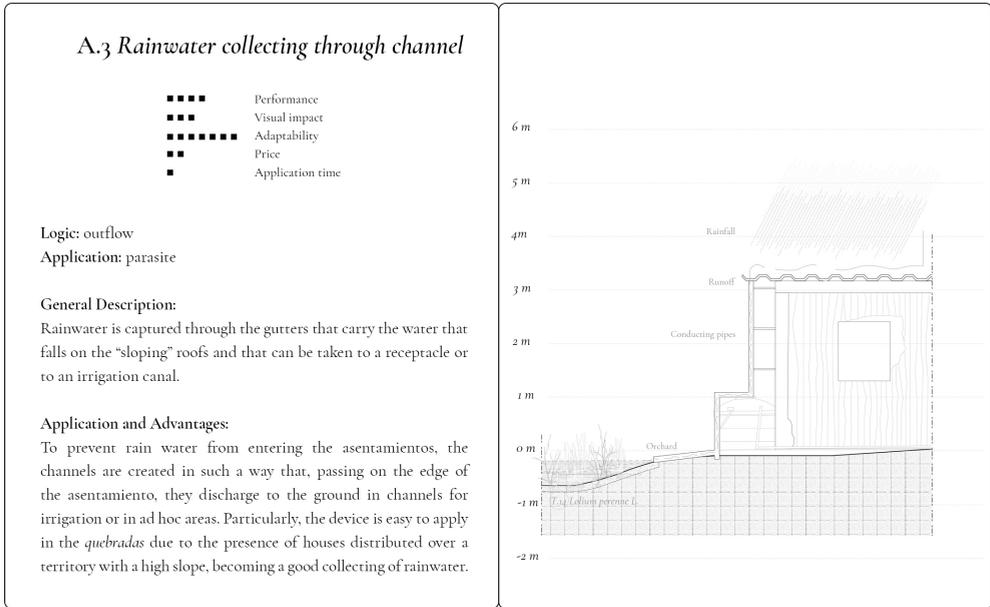
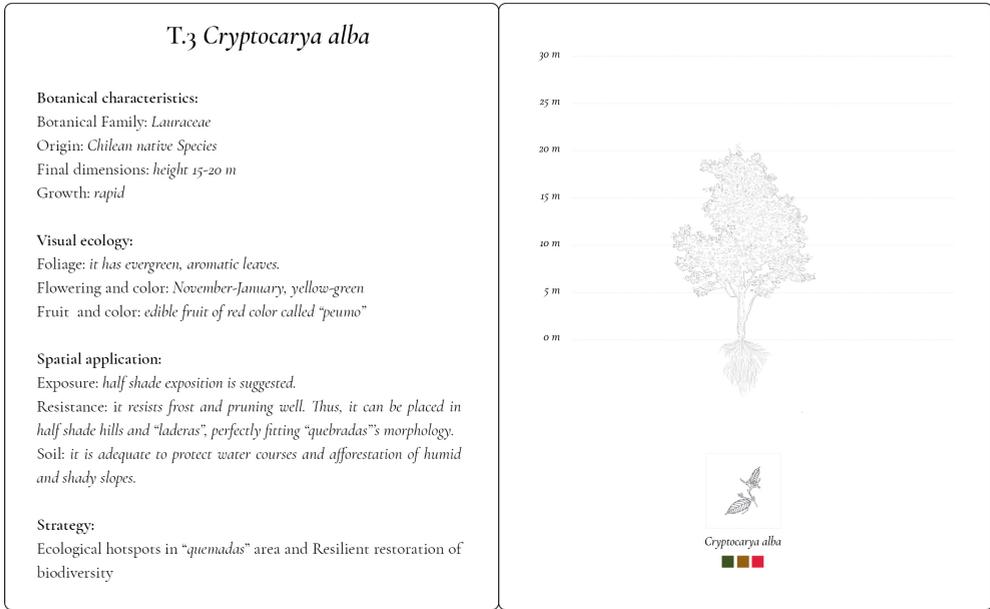


Fig. 2a - T3 Natural devices. Abacus of integrated strategies (the authors).
Fig. 2b - A3 Artificial device. Abacus of integrated strategies (the authors).

(Oudolf and Kingsbury, 2013); and recycling collection (strategy 9). These nine strategies are activated by selected devices (ex. T3 device *Cryptoria alba*),

illustrated more in detail in a proposed abacus (fig. 2a-2b), to highlight their characteristics and spatial applications.

The different strategies are activated into the territory, through the creation of a non-invasive and sustainable infrastructure, capable of fitting into the selected territory and its environmental processes, while connecting with local actors and communities. The final proposal is multidimensional and multi-scalar, divided into different actions in time: the nine strategies act spatially and they temporally overlap, always interconnected, defining a flexible and dynamic masterplan.

The actualization of this design proposal is finally visualised in the Dynamic masterplan (fig. 3a). The dynamic masterplan is used to visualise in space/time the nine strategies; it describes the development process and the temporal relationships between the different actions, and the simulation of spatial-temporal disturbances. Thus, in this dynamic masterplan, flexibility and dynamism become fundamental: instead of a single definitive masterplan, nine strategies of development are suggested in different visions. Some devices can be activated over time (for example the lighting system), while others can be deactivated (sewage bank) by creating a continuous pulse that is always alive and in the process.

In particular, the nine strategies are dynamically applied on a hyper-local basis, with the punctual insertion of the described devices of the abacus, directly applied in the field. Given the dynamism of the staircase and the interference of the different elements, the devices activate an ecological rhythm. Thus, the dynamic masterplan becomes an active tool for modifying the space and activating relationships, the starting point for an open process is the integration and the exchange between nature; and the transformations through connecting local communities and ecologies.

Specifically, the nine strategies have been applied to a prototypical case: the Rio Valdivia *campamento*, in Valparaiso Region. Rio Valdivia is an average small *campamento* (57 families, Catastro de cam-

pamento 2018) and is not yet involved in the urbanisation logic of the city of Viña del Mar. Disconnected from the city's infrastructure system and without basic domestic services, Rio Valdivia is in the burned areas.

The first part of the intervention takes place on a micro-scale, with the punctual insertion of devices directly applied to the field creating a system of free infrastructure (fig. 3b). To achieve optimal performance, these devices must be able to be adaptable to the local parasitic knowledge, so that they can be easily used by the *campamento* community. For example, lighting is necessary for increasing safety and at the same time as a sign for redrawing the margins of the field. The colour, applied on the fences, restores dignity to the edges of the *campamento*; the visual ecology, applied in the voids, enhances the space of interaction. The need for basic services, such as the collection of water and sewerage, is solved through the insertion of septic tanks and vertical flow constructed wetlands creating a water system. The proposed strategies aim to ensure and promote more landscape management strategies based on scientific understanding of ecosystem function. In this way, it should be possible to design landscapes that are able to act on soil erosion and drought over time; as well as being able to reintroduce and increase biodiversity. Thus, the maintenance of relative humidity levels is crucial to be able to prevent a potential risk in case of future fires.

Choosing to develop a project that is based on an ecological strategy allows the conditions of environmental and social vulnerability to be interpreted as new opportunities for cohabitation. The morphology of the area under consideration characterised by slopes is the ideal condition to establish water systems to restore the soil through new sustainable production (Olivari and Pasquali, 2022). It is clear how landscape management is acting spatially and temporally in different ways always by being interconnected.

New perspectives for the project that co-evolves

The paper proposes to investigate the co-evolution of nature with informal development in Chile, seeing the project as a continuous evolutionary process in time and space. Moreover, one of the main issues of the authors is to demonstrate how the design strategy can be adaptable to the needs of the user and the natural conditions. Several sub-research questions are put forward: how to interact with the informal issue, how the existing policy framework supports the proposed strategies, in the transition process, how to support informal households and ensure their voices are heard.

This project proposes an abacus of devices for the application of nine different strategies and the dynamic masterplan as project tools to help inform informal settlement dwellers, communities, and farmers to transform land-risk practices into ecological land-acting practices. The abacus provides detailed knowledge of devices that can be used to inform communities or land planners. This process is mainly divided into two steps: analysing the existing fire-risk soil conditions in the case study of Rio Valdivia, and then transforming the logging areas through different territorial strategies and practices. Afterwards, it is advisable to intervene with punctual strategies that deal with the local scale, and the human scale (such as the black water collection system, the diffusion of lighting in the *campamentos*, etc). Alongside these strategic and intervention proposals, the project represented through the use of a dynamic masterplan proposes an approximate projection of how devices can act on the land and informal settlements, aware that human interaction in the development process with nature can alter the outcomes. For this reason, the abacus aims to describe the procedures and guidelines underlying the project in order to extrapolate principles for local communities.

Looking at the research project “Casos ejemplares de manejo forestales en Chile, Costa Rica, Guate-

mala y Uruguay” (FAO, 2016), the cases reported in Chile show that forest management, applied with sustainability criteria, reverses the processes of deforestation and forest degradation preserving the environmental services of forest ecosystems. It is also necessary to understand where the possible investable funds/landowners come from. Obviously, in the case of modest workers, seeing the possibility of a current gain against a possible future one removed, means that few are willing to make this investment without incentives.

For these reasons, it is necessary to propose a project strategy that is also implementable and manageable by local communities and that does not depend entirely on large national or private funds. For the proposed strategy to work, therefore, it is necessary to associate the proposed tools, abacus and dynamic master plan, with a system of incentives that are currently not supported by the Chilean government, incentives that can then be used by local communities. To put these frameworks into a systemic approach, it is necessary to integrate economic science with ecology, and culture with nature to re-establish a reciprocal relationship between man and nature (Costanza 1996). In addition, it is crucial to understand with what funds and what possible actors can promote and agree to such a proposed development model. Through a gradient of actions, the goal is to re-establish a reciprocal relationship between human and natural processes in alternative productive landscapes: where the human factors must be correlated and integrated with the natural processes.

Conclusions: the impact of the coevolutionary project

Social housing policies of Chile have had an important cost: a significant agglomeration of social housing in the urban periphery. Social housing tends to be concentrated in peripheral municipalities, making problematic the access of the poor popu-

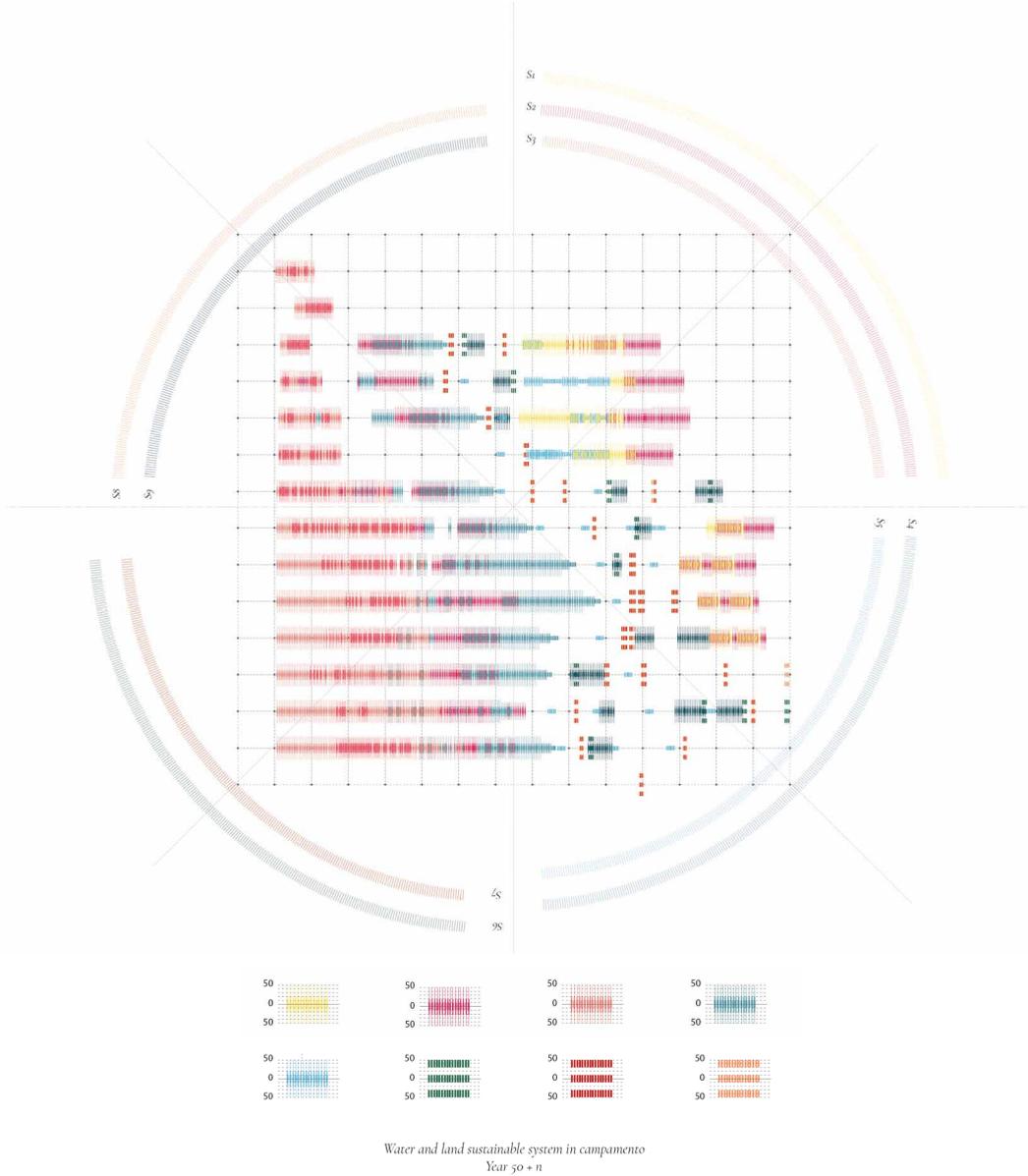


Fig. 3a – Dynamic masterplan of Rio Valdivia campamento, Viña del Mar (the authors).

lation to the benefits of living within the boundaries of a city with a good level of services and equipment (Brain Valenzuela, Prieto Suárez and Sabatini Downey, 2010). In 2004, Chilean urban planners Ana Sugranyens and Alfredo Rodríguez denounced the problems generated by social housing, given that “*Los con techo*” (those with houses) were systematically excluded from the urban fabric. Thus, the return to the *campamento* can be read as an interruption of an intolerable inhabitation. The housing itself is not the source of discontent, but the ghetto experience that is lived in the social housing complexes (Borrell, 2017).

All this happens because the Chilean social system currently deals with informal settlements through the implementation of policies for social housing, which do not consider the needs, the culture, the proximity to services, the sense of community and belonging of those who live in the *campamentos* on the sides of the metropolis. For this reason, the contribution proposes a vision of the project as a necessary tool to give it back value and enhance the condition of *campamentos* in symbiosis with its natural context. Surely, the geographical conformation of Chile, highly unstable due to the high risk of natural disasters, increases the level of vulnerability and instability of the informal settlements. The aim of

to the informal itself through a process that developed resilient and symbiotic manner thanks to local knowledge. The focal point of this approach, which sees man and nature as parts of the same process, is not to find a solution to informality, but rather to provide a design strategy to guarantee basic necessities. The relationship between nature and the informal establishment in the Chilean context activates a system of reciprocal relations whose effect is tangible on the territory. More precisely, taking up the theme of the session, the landscape project creates a new form of understanding between two worlds of two species capable of living together.

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