

# Architecture, City and Nature

Opportunities for environmental vulnerable areas

La Plata, Argentina

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**Abstract:** Recent Natural disasters like rain and floods affecting the City of La Plata, Argentina, and his surrounding areas, have provided the evidence of urban structures' vulnerability and the fragile coexistence between nature and city under special situations. The City, designed under the ideas of the "XIXth Century Hygienist Movement", has faced its own growth in a fragmented and heterogeneous manner. The foundational core spreads outside its original boundaries following the traces drawn by the highways, generating scattered areas that have, eventually, transformed the foundational ideal. Architecture should take the challenge to guide the city's growth into a more fare and socially balanced future.

To deal with the problem and operate on it, we explore the case of the "Arroyo El Gato", a stream running across the North extension of City. Here, the study of the spatial conformation of the area shows the interruption of the urban fabric in the stream's borders without any criteria of recognition or topographical adaptation to the route of the watercourse. The area represents an opportunity to break and decompose the original city grid in order to recover the singularity of the place, reversing its current situation as a barrier of urban development. This proposal considers the production of knowledge on the subject considering: the exploration/ experimentation/ modeling of urban and architectural configurations in the irregular settlement located beside the channel, its surroundings and overflow area committed to the city.

The following topics are developed:

- Proper dimensions of watercourses.
- Proper architectural conditions for risk zones.
- Continuity and rupture of the urban fabric.
- Channel- flood park with designed spaces and natural environment.
- Improvement and completion of new and existent dwellings.

Generation of public space and equipment, in order to, progressively, contribute to the spatial and social integration from the informal to de formal city

Key words: landscape, habitat, vulnerable, architecture.

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### Living in the Water... at the Arroyo El Gato

The proposal looks forward to present architectural and urban alternatives for the inclusion of low income, spontaneously generated residential areas, settled in conflictive zones. The case under discussion is that of: a watercourse that periodically give place to highly conflictive overflows compromising the settlements that have grown in the area over the years. The challenge is to get involve in the area from an ambient perspective, improving and completing new and existent housing, urban equipment and public space, in order to progressively help social and physical integration, from the informal to the formal city. From a comprehensive architectonical standpoint, we believe the case take on the challenge to transform urgent needs into virtuous facts. It is important to consider particular conditions in every irregular settlement as a departure place to set goals for a project driven by the idea of integrating different components into a comprehensive habitat, as a unique display and not as a result of diverse interventions. There is no such thing as a generic or homogeneous situation generated by the irregular settlements as a result to their relations to watercourses.

It is possible to understand the case diversity in connection to:

- The housing issue: the inhabitant's economic condition, the building material's quality, the maintenance of public and private space of the dwellings.
- The watercourse issue. There are two main factors under these subject: the potential danger implied by flow stability, under which formal housing, urban infrastructure and urban equipment are engaged; and the possibility to consolidate the stream flow under the worst case scenario making the most of its landscape potential.
- The Urban Structure: either consolidated ones or the ones to be developed, are directly affected by regular watercourses or their overflow areas. One relevant fact that needs to be considering for the creation of a homogeneous urban tissue – sustainable and socially inclusive- is the importance that El Gato stream has had in setting the chances for the continuity or rupture of the urban fabric. Facing vital issues as the ones already shown, irregular settlements either programmed or not, must be studied taking special care of its organization, as the previous step for its eradication. Partial processes as: eradication, solving the hydraulic emergency, rerouting the urban tissue or the infrastructure are often the first resources to be applied. Through these glasses, the ensemble problem, from the urban and architectonic position, lives the discipline facing the “urban Project” issue, so that the architectural scale assumes the problem as a whole instead of the diversity of propositions.

### Theoretical Framework

We step forward from the “architecture as a discipline” framework to give access to “the design method”, understood as a research instrument in addition to the empirical work already displayed in type cases in La Plata's settlements. The complexity of the technical issue in the construction of urban context and contemporary society's polisemia are shown in the tensions arrived during the land occupation process and its subsequent evolution. From a global perspective, to face the constant need for city growth, the options of combining densification with quality living conditions have to be presented.

This kind of urban land use, incorporating the minimum resources, contributes

to achieve better sustainability standards, incorporating land valuation, its performance and application. The so called, medium-sized cities, suppose a consolidation process growing progressively, from the core to the peripheries, generating diverse situations of sprawl, urban density, integrated or not to the city fabric. In different degrees, the isolated settlements in distant areas tend to drive the extension and complete the process of urbanization. The areas in-between, as natural extensions of the formal city, become opportunities to consolidate living areas (habitat) which include the less privileged sectors in society. This process can also be seen in La Plata, as a representative case' study for mid-sized cities. It shows a meaningful city growth based on the original urban project, as well as scattered settlements. We consider that architecture should take the challenge to guide the city's growth into a more fare and socially balanced future. In this context, the urban project scale as a disciplinary entity sets urbanism as a real object within the architectural production world and as artistic instrument to build the city. It overcomes the idea of an abstract representation with technical bases to offer a place for "nurturing the urban dimension in architecture". In this sense, the state of the art in regard to the so called "social habitat" sets the housing issue as a fact, among many others, in the construction of the urban environment.

### Methodology

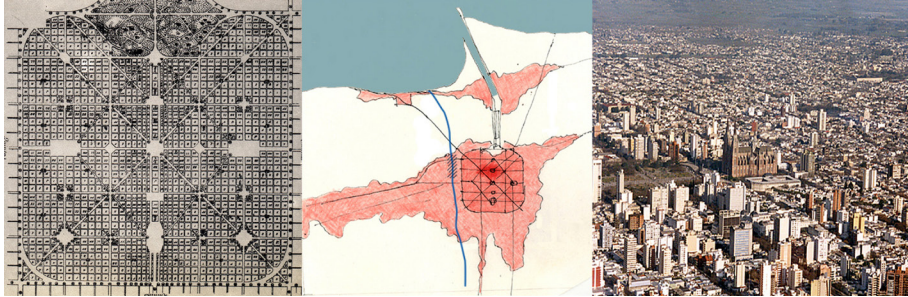
Recent problems discovered in the core of today's society can't be solved, only with architectural types as a result of historical expertise. Contemporary complexities make us think about the urge to find a rational method to determine typo-morphologies that take in, and give answers, to "unknown" complexities.

Architectural research uses the design as a tool to create knowledge, as the study subject and as a tool for research.

The empirical procedure for the arroyo "El Gato":

1. Site's peculiarities recognition.
2. Photographical exploration of the site, taking in account topographic and landscape facts, housing typologies, infrastructure and building materials.
3. Potentiality's evaluation over: watercourse's natural landscape, urban structure, availability for housing development.
4. Bibliographical compilation and study of precedents.
5. Landscape architecture intervention proposal

In this way, project is understood as a propositional action defined by the suggestions coming from previous actions and models oriented and resume from theoretical indications so that it is allowed to reason over the inspiring model. In the case presented, spontaneous urban and architectural organizations set in complex surroundings are covered with signs. We are challenged to find the connection between the place as founded and the transformation encouraged for its enclosure into the formal city. In concern to urban and architectural theme, landscape, water, housing, public space, connectivity and the addition into the urban environment, are proposed in an integral architectural perspective. Architecture for the city: where social inclusion issues work together with architectural and urban design as a dialectic couple required for our cities' future.



*Fig.1. City of La Plata. Foundational urban quarter -territorial extension- El Gato's stream location.*

### Case presentation: La Plata and the “Arroyo El Gato”

Consolidation and transformation process' characteristics in Argentinean mid-size cities could also be seen in La Plata, as a case study representing mid-sized cities with a significant sprawl over the foundational plan, as well as scattered settlements in peripheral areas (Fig.1).

Recent Natural disasters like rain and floods affecting the City of La Plata, Argentina, and his surrounding areas, have provided the evidence of urban structures' vulnerability and the fragile coexistence between nature and city under special situations. At the same time, they present the possibility of starting new studies. To deal with the problem and operate on it, it is necessary to explore diverse space configurations. We analyze the case of a sector at the “Arroyo El Gato” surroundings (Fig.2). It presents a deficient and conflictive living environment due to, as already pointed out; its use as a dumping ground. The area is under- estimated, with uses below its full potential, in non consolidated spaces. Its high connectivity, gave by street ways that run across town, exceeds the neighborhood scale.

The grid continuity is interrupted once it gets near the stream with no recognition or adaptation to the topographic situation, or the watercourse outline.

The settlements boundaries are irregular and the sprawl occurred over time accentuates its development along the watercourse and runs further away from the railroad.

There is an important urban scale vacancy, with pathways running across in a non planned outline. With the only exception already mentioned, the existence of neighbourhood interstices working us public space, comes as a natural extension of the dwellings. The house type, its occupation and additive growth, under variations made to adapt to the natural environment, promote to reverse the existent “backyard” situation of the dwellings over the stream, using landscape as an inspiration for the plan.

### Hydraulic Functionality + Landscape+ Urban Tissue +Residence

It is possible to synthesize the problematic components, qualifying and defining the studies that could set previous conditions for an integral plan for the area.

They are:

- A hydraulic issue, due to the functionality of the watercourse along the region.

The studies made by different specialists after the flood - occurred in La Plata on April

2013 - show that the need of evacuation reached a level  $500\text{m}^3$  per second, from this numbers it is possible to calculate the necessary flow (Fig.3).

- A landscape issue could define a place with a notorious presence of green areas, taking advantage of the few opportunities available in the city to qualify sustainable and natural public space.

- The problem of the discontinuous urban tissue compromises the physical and social permanence of the urban area against the will of a socially inclusive society.

- A residential area in which historical occupation consolidated over time producing an inclusion problem that has to be discussed in association with this particular case. After the evaluation of project explorations and architectural and urban models, these are the goals to achieve:

1. Situate the problem of watercourse catchment area in association with urban, landscape, environmental and public space demands in coexistence with the residential environment, as one of the issues related with the city's formation along time and not as a particular matter to be partially solved once and forever.
2. To consider hydraulic stream conditions in relation to urban environmental possibilities. This should be the base and goal for models and procedures inspiring the integration of different components of the environment in a comprehensive ensemble with unique result and not as an addition of diverse interventions.
3. Identify and apply residential project strategies that allows going from formal indetermination, distinctive of spontaneous settlements, to progressive - architectonically appropriate - housing's formal configuration.



*Fig.2. Stream's surroundings engaged with the city's urban fabric.*





Fig.3. The urban flood occurred in La Plata on April 2013

### Proposal bases

Design exploration has been done under the following considerations (Fig.4).

- The development of design integrating the urban and environmental scale, in order to reverse the area segregation.
- Landscape as an inspirational theme for the design.
- Water as a place creator: instead of denying the place's refinement, we propose to take advantage of its perception as a referent point. We intend to transform the area using the watercourse as part of its identity, as a natural element that could benefit the place in a material and spiritual way, instead of thinking of it as a threat.
- Give answer to the water cycle: flood height, and soil permeability.
- Reconvert junk spaces into "spaces" working under the settlement logic.
- Contemplate contemporary and potential ways of life in relation to the site and its inhabitants.
- Pay attention to the house and public space importance as urban identity generators.
- Work under the idea of "unity in diversity".
- Improvement and conclusion of the existent and new housing constructions, equipment and public spaces, with the aim of accomplishing social and physical progressive integration from the non formal to the formal city.

### Chanel-park

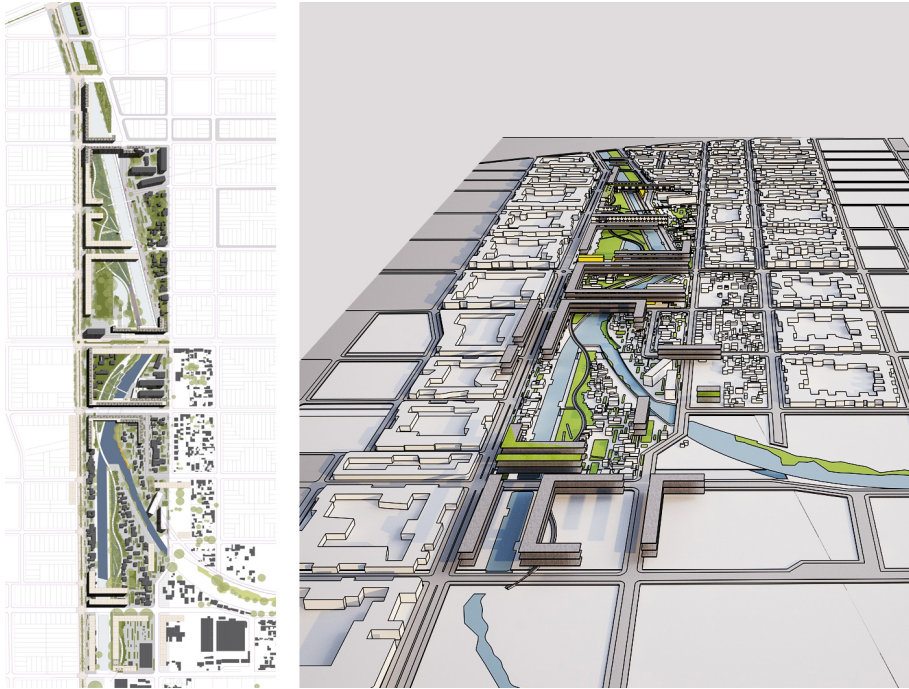
- As already said, park's architectural design and the residential unities demand for particular studies. We propose a chanel-park fitted into the urban structure that gives appropriate answers to the physical-social environment, compatible with dwellings in relation to the new conditions that will be created by the development.
- The watercourse catchment area will be calculated after an evacuation demand of 500m<sup>3</sup> per second, according to the hydraulic engineers this would result in a 48m wide and 3m depth concrete watershed.
- We design a lineal park running along the stream with variable uses. In case of a flood, the park works as a superficial channel for the rain water, so it is possible to obtain controlled flooded areas which normally would be used as public green areas.

### The residence

The project starts form reshaping the existent spontaneous/ informal settlement, contributing to the physical and social integration of the area. That is why the Chanel-park's architectural design and the residential unities demand for particular studies (Fig. 5, 6, 7). We have explored residential units contained in prisms with standard units of measurements. They could be used either detached or semi-detached, taking different shapes: blocks, ribbons, dots that would give the possibility to get intermediate spaces: streets, courts, squares. The ultimate possibility would be to build two or three floor organizations that could also keep their own courts and intermediate spaces on the upper floors, re-interpreting urban areas at a ground level. The proposal assumes the use of different materials and architectural languages, based on "traditional" constructive types that could guarantee proper conditions during the design, execution, transformation and later development of the construction. This would also result in the independence of hard construction systems or materials and in the continuity and homogeneity of resulting houses, even when the inhabitants, times and needs show to be different. The physical and social bond of the settlements with its environment is associated to an adequate relation between two aspects: morphology and language of the urban and architectonic organization. From relation points between equipment and public space, we promote equilibrate relations inside the settlement tissue with common patterns but without losing every component identity. The plan intends to find the balance –houses, housing ensembles and public spaces-between intimacy, privacy, and relation areas that give place to a suitable coexistence, as one of the essentials distinctiveness of neighbours integration and social inclusion that gives privilege to the recovery of domestic and daily life issues.

### Conclusions

We develop our proposal in the so called "Flooded channel-parks" context. They are based in the following principle integration of infrastructures works to urban landscape produce benefits that go beyond its mere hydraulic purpose. Our cities problems, in the crossroad of its growth to be achieved by spatial use's optimization, imply the need to give answers considering the urban context as part of an environmental system. The theme-problem of the streams has to be studied in its context and environmental, social and physical conditions, in order to articulate the functionality of the



*Fig. 4. General proposal for an integral intervention: Hydraulic, Landscape, Residential and Urban.*

hydraulic system with public space demands in a landscape environment in coexistence with domestic architecture. We start working over the principle of “sustainable eradication” in opposition with “eradication” as inevitable consequence of unwanted residential settlements. We understand that consolidating what is already established – as long as it helps building society, urban and environmental wellbeing- means inclusion, integration. And for that to happen, interdisciplinary actions promoting an integral design project are needed.

Eradicate, as the opposite concept, implies a partial perspective of the problem, closer to exclusion, promoting difference and fragmentation.

#### Bibliography

ALLARD, ROSAS 2007

Pablo Allard, José Rosas, “Parque inundable La Aguada. Recuperando un río urbano postindustrial en Santiago de Chile.” *Revista Summa +1*. (89) .P 38. Buenos Aires. Argentina.

HARVEY 1973

David Harvey, *Social Justice and the City*. Edward Arnold (publishers). Londres.

HARVEY 2011

David Harvey, *Il Capitalismo Contro il Diritto alla Città*. Ombre Corte. Verona. Italia.





Fig.5. General proposal for an integral intervention: Hydraulic, Landscape, Residential and Urban.

LEFEBVRE 1968

Henry Lefebvre, *Le Droit à la Ville*. Anthropos. Paris.

PANNERAI, MANGIN 1999

Philippe Pannerai Davev Mangin, *Projet Urbain*. Parenthèses. Paris.

PER, MOZAS, ARPA 2007

Fernandez Per, Javier Mozas, Javier Arpa, “D Book Density 64 Proyectos de Vivienda Colectiva” a+t Density Series. España.

SASSEN 2006

Saskia Sassen, *Territory, Authority, Rights: From Medieval to Global Assemblages*. Princeton University Press. Princeton. USA.

WALKER 2010

Enrique Walker, “Lo Ordinario”. G Gili, SL. España.

REGENERATION WATERFRONT CITIES

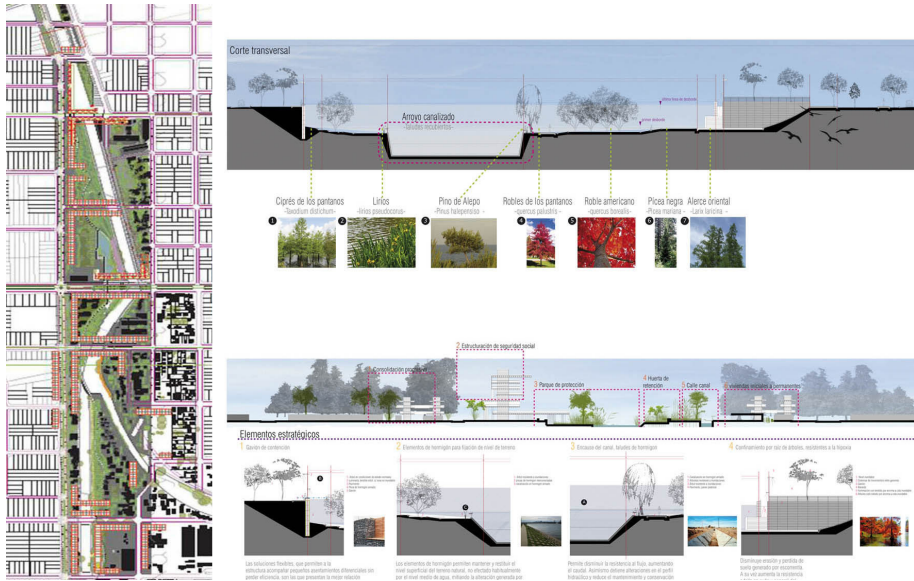


Fig. 6. The Chanel-park's architectural design, in order to articulate the functionality of the hydraulic system with public space demands in a landscape environment in coexistence with domestic architecture.



Fig. 7. Several images showing the Flooded Channel-park's proposal, Residential Areas and Public Space.