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Landscape of springs and collective outdoor laundries in the city of La Paz

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Abstract
The landscape of springs in the municipality of La Paz has been shaped by glaciers and rainwater deposits accumulated for years. In view of the landslides, the springs were stigmatized by urban planning and diverted to the sewers. When the drought hit, they were sought after, since it was discovered that they have good quality freshwater for consumption. Collective laundries, as an architectural object, arise to prevent the closure of the springs when drinking water appears on the slopes. The territories are losing their management over the resource and that is why today they are focusing on the maintenance of the laundries. This article – based on a visual study on the landscape and the social use of springs and following the track of the collective washing of clothes – sets forth a series of reflections on the resumption of our relationship with these sources.

Keywords
Landscape, springs, laundries, visual study, La Paz

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Résumé
Le paysage des sources de la municipalité de La Paz a été façonné par les glaciers et les dépôts d'eau de pluie accumulés pendant des années. En raison des glissements de terrain, les sources ont été stigmatisées par l'urbanisme et détournées vers les égouts. Lorsque la sécheresse a frappé, elles ont été recherchées, car on a découvert qu'elles disposaient d'une eau douce de bonne qualité pour la consommation. Les lavoirs collectifs, en tant qu'objet architectural, surgissent pour empêcher la fermeture des sources lorsque l'eau potable apparaît sur les pentes. Les territoires perdent la gestion de la ressource et c'est pourquoi ils se concentrent aujourd'hui sur l'entretien des lavoirs. Cet article - basé sur une étude visuelle du paysage et de l'utilisation sociale des sources et suivant la trace du lavage collectif des vêtements - propose une série de réflexions s ur la reprise de notre relation avec ces sources.

Mot-clés
Paysage, sources, lavoirs, étude visuelle, La Paz

Introduction

After the 2016 water crisis, the municipality of La Paz analyzes the development of public policies regarding the efficient use of drinking water. From the sub-municipalities, especially from that of Cotahuma, they are working on projects to make better use of the springs. In the global agenda, based on the Sustainable Development Goals (United Nations, 2018), objectives have been established to build inclusive, safe, resilient and, sustainable cities through the efficient use of water resources, the protection and restoration of ecosystems related to water (forests, wetlands, rivers, aquifers), the care of the cultural and natural heritage, and the participation of the local community in improving water management. For all these reasons, the springs have a local, national, and global importance, and their understanding can lead to better responses for their management and protection.

Four points of collective laundries have been investigated[1]: Pasankeri Antofagasta, which was chosen for showing greater institutionalism by having the largest and best equipped laundries and sanitary services; Kenanipata, chosen for its crisis of architectural objects with the landscape, as it has some early demolished laundries; San Antonio, one of the three territories with the largest presence of union laundresses, and Valle de las Flores, which is a territory with laundries that have overcome the megalandslide of 2011.

This article has four parts. The first part presents the category of the landscape. The second part shows the visual investigation methodology of the study.

The third part describes the research results regarding the territories and their hydrogeological characteristics: landslide and drought are addressed as phenomena that have impacted the relationship of the city with springs, the social use of springs is reviewed, and the landscape of these and the laundries is described. Finally, the conclusions point to some inputs for public policy.

[1] Choice made according to a theoretical sampling that prioritizes potentiality over representativeness (Rodríguez, 1999: 49).

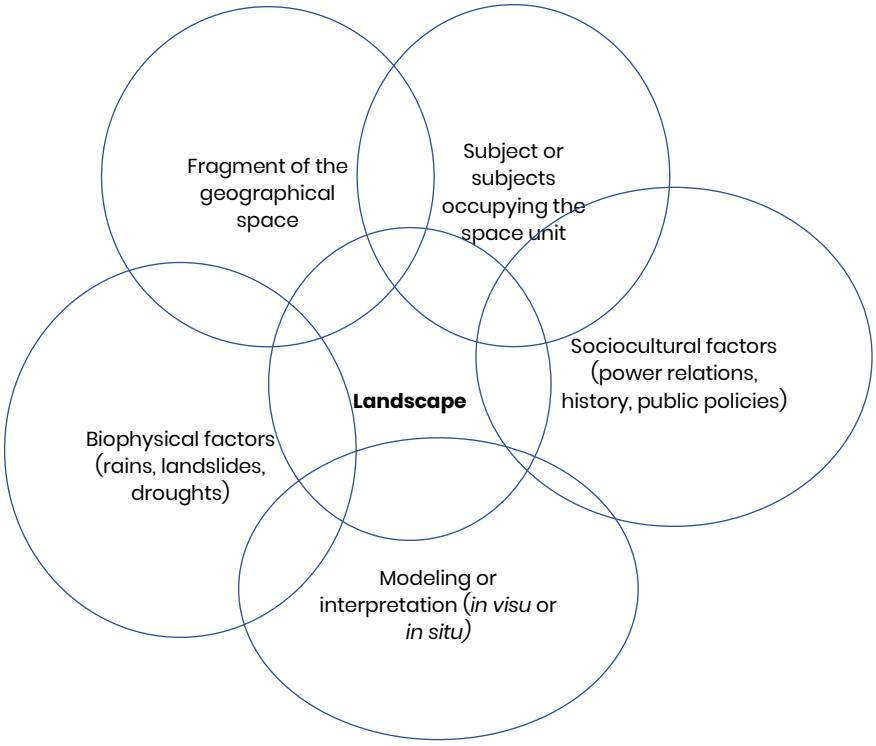
1. Landscape as a theoretical Perspective

The landscape is "the space-time unit in which the elements of nature and culture converge in a solid, but unstable communion" (Urquijo and Barrera, 2009: 2). This results from socio-cultural and biophysical factors in the categories of Pedro Urquijo (2014), or from physical-biotic events and contextual reality events (infrastructure, economic, structural, and regulatory events) in the terms of Susana Barrera (2014: 49). In that sense, a municipal ordinance, certain cultural practices regarding rivers, a landslide or a drought are factors that shape landscapes.

It is convenient to identify some elements that constitute the landscape and that have become analytical units of the study. According to Pedro Urquijo, all landscapes are made up of:

- a fragment of the geographic space (land surface and biosphere),
- a subject or subjects that occupy that spatial unit,
- factors that alter, transform or shape the landscape, which can be biophysical phenomena (climate, risks, rains, landslides) or socio-cultural factors (power relations, history, public policies), and
- a modeling or the interpretation that derives from this convergence between nature-culture "which can be *in visu* – a map, a picture, a textual description – as *in situ* – a garden, a protected natural area, a set of plots –" (Urquijo, 2014: 101).

Graph 1. Elements that define the landscape, according to Urquijo
Source: own elaboration on the basis of Pedro Urquijo (2014)



The landscape modeling is generally interpreted from the biophysical side, losing sight of the subjects, their objects, and the sociocultural factors that make up the landscape. In this study, the notion of landscape modeling is expanded from small and peripheral issues, such as washing clothes, that allow us to understand its connection with structural issues from a complex and comprehensive perspective.

2. The visual as a methodological perspective

This study gathers the contributions of visual sociology as a research alternative (Pauwels, 2011; Holm, 2008; Martínez, 2017; Dávalos, 2019[2]). However, it does not stop at the analysis of power in visual representations[3], it proposes a decentralized visual investigation of the photographic objects themselves. The study assumes the image as an element that interprets the convergence of nature-society (the landscape). Furthermore, when one starts with peripheral issues, one can go beyond the biophysical part of the landscape. This requires us to recognize subjects and sociocultural factors that are generally lost sight of in the modeling focused on producing landscape in a single visual strike[4], in a single photographic shot or in a single cartographic product.

The epistemological position of this study affirms the production of knowledge from the collaborative and performative image. The act of producing an image is already part of the generation of knowledge because photographing triggers actions and interactions between the elements of the landscape.

The images have been produced by the researcher to provoke surprise on a daily matter with the participation of people. The photographic record of washerwomen, clothing, flora, and water, with around 40 pictures, is not intended to illustrate reality; it aims to overcome simple representation to work on the idea of object-producing images with "[power], agency capacity and affectation" (Martínez, 2017: 263). To work in various ways with images has become the methodological route of this study.

In the first stage of the investigation, the image was assumed as a "device to create links" to get to know the washerwomen, their workspaces, the water sources, springs, and laundries. Pictures were produced in a fabrication exercise with the same protagonists, inventing situations to photograph the real thing. In addition, the pictures were printed to return them to their protagonists. As the investigation progressed, the image served to "generate data" on a scale of detailed and general levels on the subject, object, and space. Here the supports varied from fixed picture to video and drone shots. These images, mainly those obtained with drones, became "evidence images" from interviews in which skepticism arose about the validity of the springs. Later, to interpret the information, photomontage was turned into a semiotic model that links or unlinks certain meanings (Simó, 2010: 7) to reveal trends and data, in such a way that the image "produces knowledge" in relation to other images. The photomontage was crossed with the analysis that resulted from the interviews. Finally, when it was time to share preliminary data from the investigation, the image assumed a "triggering and performative" dimension with key actors in the problem (women, public servants, neighborhood leaders).

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[2] The possibility of "building knowledge with images" was exercised by the author in another study in which she proposed to get to know the city through pictures of clotheslines (Dávalos, 2019).

[3] According to Gunilla Holm (2008: 327), there are three types of images that are used for visual research: 1) those produced by the subjects, when cameras are delivered to them to know their perspectives and ways of seeing a certain matter; 2) those produced by the researchers, as happened here, although the concerted pictures always imply the participation of others, and 3) pre-existing images collected from archives, such as newspapers or photo albums. The representations and power relations in images have been extensively studied under this last modality (Rivera, 2016; Vargas, 2003).

[4] Landscape modeling involves a mainly visual effort, although the urban landscape is also being interpreted from sound laboratories (Schafer, 1977, quoted in Woodside, 2008). Producing combined readings of biophysics (drone shots) and objects and subjects (pictures, portraits, or video interviews) broadens the notion of landscape.

The study manages to explore other ways of investigating with the image, overcoming the practices of power analysis in the reading of icons, positions, aesthetic resources, etc. (Barthes, 1986). It constitutes a contribution to the social sciences in epistemological and methodological terms.

3. Results of the investigation

3.1 The territories and their hydrogeological characteristics

According to the 2016 Municipal Statistical Yearbook, nine hydrographic basins and 343 rivers cross the nine macro-districts that make up the municipality of La Paz (Espinoza, n. d.). It is not known precisely how many springs exist or how many have been buried or channeled to build the city. The closest data is that of the Municipal Secretariat for Comprehensive Risk Management (SMGIR for its acronym in Spanish) which has inventoried about 155 underground water points, among wells, galleries, springs, and others, in ten districts of the macro-districts Sur, Mallasa, San Antonio, and Periférica (SMGIR, December 5, 2016).

According to hydrogeological studies, the conformation of underground water in La Paz differs in structure and history (Ribera, 2017: 20).

The western slope has more chargeable material and has several emanations of underground water thanks to the high plateau which is like a giant aquifer [...]. [On the other hand, the waters] of the eastern slope descend directly from the mountain range, it has superficial and underground current; but the underground is chaotic. Due to this instability, several landslides have occurred (Solange Murillo, Risk Management Unit, Risk Prevention Directorate of the Municipal Secretariat for Comprehensive Risk Management – interviewed on September 17, 2018).

In turn, social intervention in these natural spaces generated landscapes in the city of La Paz that give identity to certain sectors of the city, which can be used not only as a water resource, but also as an urban image (Daniel Marka, Urban-Rural Development Unit, Municipal Secretariat for Development Planning – on Workshop December 19, 2018).

3.2. Springs, landslide and drought

The biophysical factors that affected the territory-spring relationship in the city of La Paz are landslides and drought.

Due to the hydrogeological characteristics of the studied territories, the 2016 water crisis was experienced differently on the western slope (Pasankeri Antofagasta and Kenanipata) and on the eastern slope (San Antonio and Valle de las Flores). The eastern slope of the city suffered water rationing that led to a social crisis; instead, the western slope was not so affected by the drought. However, the latter, when visited by other people to supply water, currently plans actions for the efficient use of its resources.

The most important landslides in La Paz were those of Cotahuma (1996), which buried 18 people and left a declaration of the Lakauta park as a cemetery (Cazas, May 5, 2019) and the mega-landslide in Pampahasi (2011), which buried three districts (Valle de las Flores sector A, Santa Rosa de Callapa, and Callapa Bajo) and left severe damage in four others (Valle de las Flores B, Kupini extension, Kupini Dos and a sector of Pampahasi Bajo Central) (Morales,

March 6, 2011). On the other hand, the 2016 drought forced water rationing in 94 districts on the eastern slope and in the southern area (Chuquimia, December 19, 2016), causing social chaos.

From some perspectives of urban development and risk management, the landslides were caused by underground water sources. From this point of view, in many slopes, the tubing of sources was practiced, mainly when the territories already had household water. In this way, the use of spring water is disregarded, it disappears from the landscape, and the territories start a cycle away from their sources (Monclús, 2002). This situation coincides with a growing urbanization, although the upwelling points of water remain in the hydric memory of the territories[5].

Recently, professionals with hydrogeology bases propose to review the idea that springs are the cause of landslides.

The springs can grow a flow, but they do not harm the topography of the city. What does produce [landslides] is the increase in surface water with rains and when homes that do not have adequate sewer connections and only have wells, filter those waters into the ground (Edwin Laruta, General Director of the Vice Ministry of Drinking Water and Basic Sanitation, Ministry of Environment and Water - November 22, 2018).

3.3. Social use of springs

An apparently well-known concept, but one that shows limits, is that of the "social use of water". From a legal perspective,

"[t]he right to water covers only personal and domestic uses, which is the consumption, the washing of clothes, the food preparation, and the personal and domestic hygiene. It does not include the water necessary for agriculture or grazing, or for the maintenance of ecological systems" (OHCHR, 2002: 12-13).

Implicitly, at the level of institutional regulations and practices, the concept of the social use of water which is used, is seen as being too attached to the drinking water and sanitation system which, for example, causes the loss of sight that springs are also ecological systems of daily life because they are part of activities such as washing clothes on the slopes of the city of La Paz.

a. Springs and regulatory water institutions

The sociocultural factor that affects the forms of use of spring water is related to the presence, opposition or coexistence of regulatory institutions of this resource in the hillside territories: cooperatives and state water institutions. In the absence of drinking water coverage on the slopes, due to a colonial urbanization that prioritized this resource for the

[5] "We know that La Paz is a place whit a lot of springs. Here, in the area, in that place where there was a wetland, there were several springs. There was a spring where La Granja was, Doña Marcelina, Doña Toribia [who are here] must remember. And well, I don't know, due to the inefficiency of the Municipality, in the administration of Juan del Granado, in order to not complicate life, they have taken it to the sewer system, it was a spring with considerable flow. So, it's piped. But there are also springs that are in the houses and I know that water cannot be private property" (Richard Churata, Pasankeri Laundries Committee – interviewed on November 11, 2018).

city center, water cooperatives were formed[6]. With the arrival of drinking water on the slopes, these cooperatives resist losing control of this resource and discourage their associates from connecting to the drinking water network. For this reason, at the time this paper was written, some territories of the western slope, mainly Cotahuma, use the water from the springs for consumption. On the other hand, other territories configure mixed provision systems of the liquid resource and in that way, they freely supply themselves with the water from the springs and the EPSAS water network (José Quiroga, Deputy Mayor of Cotahuma – interviewed on November 22, 2018)[7]. They use the spring water mainly for the collective washing of clothes.

The control of resources is expressed in the resistance of water cooperatives to the intervention of the water resources of the territory by state institutions. The resistance to tubing springs and promoting the construction of collective laundries around these sources is part of a reaction to the urban institutionalism of water that ignores the rural enclaves of water in the city and ignores the activity of washing clothes as part of the ecosystem of springs. Urbanization, its positioning on the spring-landslide link, regulations, architectural design, and organizational structures have generated cycles of distance and concealment of underground sources. However, the drought has forced the population to turn to these alternative sources of supply, initiating a cycle of approach that, it is hoped, will activate actions for their protection.

[6] "Historically, the springs have been used with a principle of extreme necessity, because before, unfortunately, there was no water service on the slopes or in the intermediate parts of the slope, which is between El Alto and the city of La Paz. There has been an overpopulation of people who were relocated and who came from the provinces, due to the neglect of the central government and the relocation that took place. So, unfortunately, they asked SAMAPA for water. But, back then, SAMAPA said that they would have to buy a pump, it had to implement a system for the water to rise and that was very expensive, and that is where the ancestral knowledge of water management of the people who came from the provinces and the mines arose. They implemented the matter of collection, the discovery of water sources, and, facing this urgent need, the water cooperatives or committees throughout Cotahuma have been constituted" (Rubén Callisaya, administrative technician and former leader, Cotahuma Sub-Municipality – interviewed on November 22, 2018).

[7] "Afterwards, it has been urbanized, we made the procedure before Aguas del Illimani and they have entered with the water network matrix throughout the area. So, our spring is now obsolete. [And, maintaining the spring for laundry] has been the initiative of some neighbors, it's necessary to give this acknowledgement. We had some neighbors, like Don Cristóbal, Don Luis Quispe, and other neighbors who have already died, who said: 'at least we have that'. So, they have given a little fee for cement and afterwards it became a laundry, so the water does not run away" (Adrián Zegarra, Neighborhood Council of Valle de las Flores – interviewed on November 14, 2018).

b. Springs for consumption, for washing clothes and other uses

The spring water is used for the collective washing of clothes and for human consumption, although there are no statistics in this regard that EPSAS has been able to provide.

Picture 1. Mrs. Cecilia Zambrana, representative of the washerwomen of San Antonio
Photo: J. Dávalos, 2018

The census statistics for 1992, according to the Statistical Yearbook of the Municipality of La Paz, established that access to water by pipe or network represented 85.15%, by well water 5.29%, and by river water, spring or canal 4.83%. On the other hand, for 2016 it was projected that 96.64% of the houses would have access to water through a network pipe; by river, spring or canal 1.81% would access; by other means 1.42%; by well or waterwheel 0.11%, and by delivery car 0.03%. In the observed districts (Pasankeri, San Antonio and Valle de las Flores), for 2016 it was projected that the water supply by spring or river would represent 0%. Only in the case of Kenanipata a use of these sources was projected at 1.26%. According to these data, it was assumed that the greater the access to piped water, the lesser the use of spring water would be, without inquiring about its actual use. However, from another perspective, washing clothes in the springs can be read as resistance to the state institutions and to untie the activities of caring for the ecosystem of springs.

Although the main focus of this research is not measuring water quality for human consumption, it is stated that spring water is sweet and acceptable, despite all forecasts. During the 2016 drought, 169 spring water samples were taken and 96 of them qualified as acceptable, according to the Contingency Plan Report for precipitation deficits (Updating and monitoring of springs of the Municipal Secretary for Comprehensive Risk Management of the GAMLP). The quality of this water, according to standard NB 512 of the National Regulation for Quality Control of Water for Human Consumption, is acceptable for human consumption (SMGIR, January 2017).

Actions for the protection of spring water have been neglected because, from an engineering perspective, the flows are not sufficient to supply a whole population[8] and in addition, there is a partitioned notion of water as a service and resource. The municipality of La Paz, like the rest of the municipalities of Bolivia, can work on a law on the efficient use of water, but for drinking water and sanitation, not for the protection of this type of underground sources, because they are owned by the state. Regulating something in this regard would mean exceeding legal competences.

Water consumption and activities of washing clothes are the two main uses of spring water. However, there are other uses: irrigation of green areas and the use of these waters as a component to compact solid waste[9] and as a component for real estate construction[10]. Many springs are known to be on private property[11] despite the fact that the Political Constitution of the State indicates that the resources may not be the object of private appropriations (CPE, Article 373, 2009).

It is difficult to determine whether these other uses are social or for commercial exploitation. However, there is a sharp sight on the use of these underground waters set in some subjects more than others. There is discussion regarding the architecture around the springs or the quality of water distribution carried out by the water cooperatives, but little is said about the use of these sources by companies or small companies. EPSAS is the entity that authorizes this type of use[12], which makes sense if we remember that behind these forms of use there are certain subjects and interests, some more visible and known than others.

[8] "The springs are for rural use, not in the city because the quantity of spring water is minimal, it only reaches a maximum of 1,000 inhabitants. The municipality of La Paz has the springs on the eastern and western slopes, but it's necessary to see the quality of the water, if it is for consumption, but the safest thing is to use it for washing clothes" (Enrique Torrico, head of the Sectorial Development Unit, MMyA – interviewed on November 27, 2018).

[9] "There is a tank truck from EMAVERDE, which is now in the river bed charging water to make compaction of the garbage in the sanitary landfill" (Ximena Galdo, head of the Cotahuma Sub-Municipality's Infrastructure Unit – interviewed on November 1, 2018).

[10] "[During the 2016 crisis], water was and is extracted from Florida for construction" (Conversation with the Environment technician on the Aranjuez spring).

[11] "We have done some tests in the Jachacollo area and in the Amor de Dios area, for the moment they have their captures there inside the houses as they are the owners of the land, but this issue should be analyzed when some type of regulations is set up" (Solange Murillo – interviewed on September 17, 2018).

[12] "[About the Tennis Club?] In that case, and this must be corroborated with EPSAS, EPSAS charges the Club La Paz, or Coca Cola, which has a similar situation, an amount for the social use of water according to Law 2066 (on the Provision and Use of Drinking Water and Sewerage Services) and with the permission of the AAPS, Autoridad de Fiscalización y Control Social del Agua Potable y Saneamiento Básico [*Authority for Fiscalization and Social Control of Drinking Water and Basic Sanitation*], differentiating between social use and use for commercial exploitation" (Edwin Laruta – interviewed on November 22, 2018).

Graph 2. Uses of spring water in the city of La Paz
Source: own elaboration

The above graph illustrates the use of spring waters, opting for an open representation due to the lack of numerical data. The graph corresponds to a conceptual and institutional vision that divides water as a resource and as a service (Barraqué, 2010). This division affects the practices and competencies of the water institutions. It is not possible to articulate actions regarding the underground sources to influence their regulation and quality of use from an identification of uses. The absence of data on springs, even among the same institutions, mainly from the central state, is an example of this.

The existence of data on the human consumption of springs should be surveyed under the direction of the Vice Ministry of Drinking Water. However, the entity does not have such information and EPSAS does not share information in this regard - although it is known that it extends authorizations for some private entities and water cooperatives to use underground water. The Vice Ministry of Water Resources has focused mainly on basins and rivers and it does not have specific tools for managing springs. However, it recognizes that the management of springs represents an important technical expense for the measurement and quality control (Paola Mancilla and Daniela Alanoca, MMyA Study Unit – interviewed on November 27, 2018). In contrast, the Autonomous Municipal Government of La Paz had an impact on these sources from the perspective of infrastructure, however, to deepen actions would require a regulation. In this regard, a municipal technician points out:

There is a legal vacuum, we have no occupancy or destination regulation, we cannot put equipment or laundry facilities; it is not typified. So, what is done in those cases, is to grab the use of a higher category, which is a forest area in that sector, and the park, courts [or laundries] are taken as accessories. Work is being done in this sense for the administration of land use. The spring is tangible, it is territory, and in the territory society, administration, and economy intervene. We must think of a new regulation, municipal or national competence, for the resource of springs. We must identify these spaces, maintain and manage them while maintaining identity and symbolism (Daniel Marka, Urban-Rural Development Unit, Workshop December 19, 2018).

3.4. Springs and laundries

3.4.1. Knowledge and practices of washing clothes in the springs

There is a sociology of washing clothes in springs that should be described to understand the landscapes of springs and laundries in four hillside territories.

One reason why women wash clothes in springs is time. The springs have a water flow greater than that of the household pipe, which allows washing clothes in large quantities and in less time than at home. Since women are primarily responsible for washing clothes, springs are an alternative to "save" time.

To understand the importance of a good architectural intervention, it is necessary to consider that household linen is washed in the springs (blankets, quilts, and other big items). This is why women wash with their feet as a technique to avoid wrist and thumb pain. In addition, there is a knowledge regarding laundering that goes far beyond clothes washing and drying techniques. This has to do with water knowledge, the recognition of water flows and chemical knowledge of washing and the flora of the territory[13].

Another reason that explains the use of springs is space. The real estate market and the architecture of the house respond to a bias that sacrifices the spaces of everyday life and falls on the reduction of kitchens, miniaturization of household laundries, and other important domestic spaces for the reproduction of life (Dávalos, 2019). For this reason, many people who live in apartments use the springs to ask the laundresses for their blanket or carpet washing services. In addition, many tenants wash their clothes in the springs as an alternative to the reduction of space, the lack of access to the patio, clotheslines, and the use of water. They can count on the installation of drinking water, but, their free access to water and washing spaces is conditioned to the decision of their homeowners.

[13] "I've gotten used to washing with this. The plants are over there, it's called muñumaya, those with little balls. So, you tear off the leaves, put in what you are going to wash and you start to soap, you make a blend and it cleans very well. There have always been these plants, they grow at the same where the water comes out" (Verónica Zuleta, Kenanipata – interviewed on October 7, 2018).

Picture 2. Laundries of Pasankeri, Mrs. Marcelina Lecoña, responsible for the laundries
Photo: J. Dávalos, 2018

I am a tenant and I come here. I also pay for water and electricity, they don't tell me: "But, you don't wash clothes". They charge me just the same, but why am I going to fight, I prefer to come here. I live inside, it is cold, the ground floor is freezing cold, up there it is like an alley, they are rooms, just rooms, I have my laundry at the door, the only thing I use is to wash dishes, on the door I have a little space, there I hang my socks, there is no way to dry. Upstairs, they have a patio, downstairs no, that's why I wash here. This is comfortable, it is calmer and you rinse faster; soaping, of course, it takes time, but I have the sun, I let my clothes drip and I take them wet, sometimes I take them dry (Lidia Chura, San Antonio neighbor – interviewed on October 14, 2018).

There are also those who wash their clothes in the springs out of a need for fresh air and open space. There are families that move in cars carrying their tents, food, and games to wash blankets, wash their puppies and spend a weekend with the family. In these cases, greater male participation is observed and these are ideal spaces to socialize the importance of sharing care activities between men and women.

Picture 3. Boys and girls play while waiting for their blankets to dry - Laundries of Valle de las Flores
Photo: J. Dávalos, 2018

Another group in the springs is that of the washerwomen, who offer their laundry services to generate economic resources. Many are tenants. They are the main keepers of these spaces and the ones that have most demanded improvements in the laundries. They have generated rules on the use of these and of the springs that they have learned to respect for their coexistence as a group. They recreate cultural practices for their social cohesion. For example, every 5th of August, the washerwomen of San Antonio gather around the Virgin of Copacabana who protects their workplace.

The springs have become an alternative for many people who need to wash their clothes. This practice shows the limits of a concept of the right to water closely linked to access to drinking water and sanitation. Apparently, washing clothes requires the exercise of other rights: the right to water to wash, the right to the sun, to spatial justice, or the right to air. Obviously, these words do not exist as legal categories for the Bolivian case. However, everyday life shows us the complexity of washing clothes in the city and its connection with other issues (for example, housing and territory). Behind the landscapes of women washing in the springs, there are women and children who seek the outdoors and nature and who assume that washing clothes is part of the ecosystem of springs and not necessarily an activity subject to home.

Picture 4: Laundries of Pasankeri, a young man and his pet
(Photo: J. Dávalos, 2018)

3.4.2. Harvest or capture of springs

Many laundries were installed around the springs in an almost natural way. The women captured the water, piled up stones and spread out plastics that served as containers, they dried the clothes on the vegetation or stones of the place. Over time, with the appearance of drinking water at home, the springs were threatened with closure. So, it was proposed that collective laundries would be built around the upwelling of the water. In this way, works to capture the springs began.

Of the four cases observed, in two territories (San Antonio and Kenanipata) it has been demonstrated that the capture of water from springs has not been so favorable because there was a reduction in the water flow with effects on the women's work and because there are leaks that to date damage the new laundry architecture (as in the case of Kenanipata). On the other hand, in Pasankeri and Valle de las Flores, it is considered to have achieved a good capture of water. These territories had a greater water flow and, in addition, they had an intervention based on a good knowledge of groundwater capturing and social participation. The Pasankeri women, who are also female builders, assured that their harvesting of spring water was delicate and focused on waterproofing the soil.

> *Well, with this **plastic** we have waterproofed, it is no longer filtering. We have collected this water from the corner, from the point, with a large stone. We have put **plastics** so that the water comes out of the ground and on top we have put stones. So, that water goes like this to the pond, there is a chamber and it enters in that chamber. This water is very clean; it is on top of the chambers. Everything inside is very clean, the holes are wrapped with clothes, with that cloth with "kiruntata" holes, like a sifted water hole. The water is collected, from the corner it has entered directly, we have cornered it. Thus, it leaves the bottom, already on the way, as it was lowered, we have encircled it. We have worked on this cleaning* (Marcelina Lecoña, laundry responsible, Pasankeri – interviewed on November 4, 2018).

The process of capturing springs is not only an architectural matter, although the municipality of La Paz has been able to build and improve laundries from this item. Since La Paz is a municipality with abundant underground water sources, there is a need for specialized knowledge in geology, hydrogeology, engineering, environment, etc., to map the sources, classify them, analyze their annual behavior in volume and quality. In other words, the maintenance of the laundries in charge of the territories, mainly the washerwomen, is not possible without comprehensive and interdisciplinary actions on underground sources.

3.4.3. Architectural objects of the landscape: laundries

Once the underground water has been captured, the construction of the laundries is the next item. From the observed cases, architectures inconsistent with the landscape and architectures consistent with the landscape are recognized.

a. Architectural objects and little harmonious convergence with the landscape

In places where there were poor captures and the water flow was reduced, unsuitable architectures for local washing practices are evident. However, as it was said, the disappearance of the flow in laundries that went from a natural state to a cement design is not only an architectural phenomenon[14].

[14] "What the Kenanipata laundry lacks is a storage tank, our project does not have mega-financing, but the idea is that the water is stored because that water resource is being wasted [...]. In the design, it has also been difficult to see the availability of where to locate the laundries, where to locate the car wash, because this sector of Kenanipata is a slope. As a project we have only been able to get to the identification study, we did not have more money, and the idea was also to get them to do it with their own means, valuing what it could mean to do it with the municipal Annual Operative Plan. I do not know why they question the flow; we have made the calculations so that the flow is enough for the laundry and also to have stored water, but we did not have a place to locate the tank" (Ximena Ayo, Swisscontact – interviewed on November 5, 2018).

Picture 5. Laundries and washerwomen of San Antonio
(From right to left: Dina Calle, Martha Arratia and Yola Quispe, faucets of the disused laundries, in the center the water container)
Photo: J. Dávalos, 2018

The Kenanipata laundries construction project (2017), which even had the guidance of an NGO, prioritized the installation of a water degreaser to clean soapy water, rather than the location of a tank for the collection of water, the provision of clotheslines for drying or the installation of a toilet. This decision is striking, because if a flow is weak, a water tank is required to accumulate this resource (Acción Contra el Hambre, 2007).

The architectural trend is to distribute water in several laundries, making the central fountain disappear, seeking to equate these laundries with those of the homes[15]. Another trend is the installation of suspended laundries to prevent women from washing "bent and stooped". So, both in Kenanipata and in San Antonio, the construction of suspended laundries with a distribution of water in several faucets was arranged, which quickly fell into disuse due to the lack of water pressure. Fortunately, in the case of San Antonio, a container was left in the center from which people draw soapy water and in which clothes are rinsed. By contrast, in Kenanipata only suspended laundries and containers were left, so a container with plastics was improvised again, returning to the original concentric structure.

This orientation in architecture responds to a lack of knowledge of washing practices (remember that women go to these places to wash a lot of clothes in a short time) and to a lack of ergonomics of washing (based on footwork). A neighbor of Kenanipata relates this discord:

[15] "Many of us are used to opening the faucet hard to make it easier, but that also means spoiling a lot of water. So, the entire resource has been channeled, but it has been divided among the places that have to have access to water; there is not a single faucet as before, there may be some difference there" (Ximena Ayo – interviewed on November 5, 2018).

You have seen that they have piped the waters and there in the corner it is filtering. We wanted pure pans, but they did not want to. The architect says: "No, a lot of money". These [containers] are just brick, the laundry is not of stone, we wanted to make it out of stone, there is so much stone down there, but they have made with pure brick. We are dissatisfied with the laundry, the pipe that allows the water to enter for rinsing and soaping is very narrow. I have told a worker to put a wide pipe so that it does not stop. Look at that pipe, it is small, it does not go in fast, as you are seeing. That is why my companions have gone down there [to the avenue], there the water is more plenty (Primitiva Ticona, neighbor and washerwoman of Kenanipata – interviewed on January 7, 2018).

The architectural approach that is imposed in the construction of collective laundries is the same as that used for housing. There is no understanding of the peculiarities of washing in the springs. However, the lack of dialogue and understanding leads to early dismantling and social disorganization.

The absence of toilets in these spaces is another aspect to reflect considering that women spend many hours with their children in these places. Of the four places observed, only one has toilets.

Picture 6. Kenanipata laundries and laundresses
(In the center, Mrs. Primitiva Ticona and her grandson. Distribution of water in various pipes; central water container dissappeared)
Photo: J. Dávalos, 2018

Drying spaces are important, but only in two observed territorie these are available (Pasankeri and San Antonio). In San Antonio however, access to drying areas, clotheslines, and sheds is not free since these areas are arranged by union washerwomen, they are for their exclusive use. For this reason, the women use the railings that the municipality places to protect these spaces as a clothesline, although the municipal disposition orders that clothes are not to be hung on these railings to maintain them painted. These details would have to be part of architectural perspectives considering that the wet clothes are quite heavy (some women of Kenanipata have suffered falls while transporting their wet clothes when going home when they were using a steep path).

Picture 7. Laundries of Valle de las Flores, a couple take their clothes to dry at home
Photo: J. Dávalos, 2018

b. Architectural objects and harmonious convergence with the landscape

The most consequent laundry architectures have resulted from social participation and observation. In the case of Pasankeri, one can even speak of an architectural ethnography (Merlinck, 1995) promoted by the women who participated in the construction of the laundries.

I have thought to myself. I have told you, Mrs. professional, please, we do not want it like that. We want it like Tacagua. So, the professional went to Tacagua and that's why she did it like this. I have complained and she has listened to me. Because there is no way of [washing] standing, lifting, handling the blanket is for young women. So, look, clean water is dripping, people rinse, one footstep and it rinses by itself. A lot of blankets, they put it all in. Now, we have placed ceramics [on the floor] and it rinses quickly (Marcelina Lecoña – interviewed on November 4, 2018).

The women-technician relationship is due to the fact that the women of Pasankeri are builders or they became builders in the construction of the laundries, which gave them a greater possibility of directly intervening in the decisions of the project.

One speaks of architectural objects converging with the landscape when there is an understanding of the needs surrounding the washing activities and the geographical space itself. Architecture can respond to these needs in two dimensions: material and symbolic. The material aspects have been arranged in territories with an architecture of water containers suitable for the type of clothing that is washed in these spaces (Pasankeri, Valle de las Flores), with drying spaces (Pasankeri and San Antonio) and, even, although in only one case, with toilets and garbage cans (Pasankeri). The symbolic aspects arranged by the architecture, which help to reinforce the sense of these spaces, have to do with the installation of important elements for the territories, such as the cave of the Virgin of Copacabana for the washerwomen of San Antonio or the wall painting with a Jesus holding a cattail raft in his hand - alluding to the belief of the neighbors of Pasankeri that the springs had their origin in Lake Titicaca.

Picture 8: Laundries of Valle de las Flores, families set up their tents while washing clothes
Photo: J. Dávalos, 2018

Convergent architectural objects with the landscape have a material and symbolic level of work. In the case studied, this work occurs when there is participation of the subjects of the territory. This does not mean that improving laundries necessarily implies following an aesthetics of over-construction of spaces, as springs are also visited for being natural outdoor spaces where families have picnics.

3.4.4. Social management of springs and laundries

Although social participation can influence a good intervention in the landscape, a good intervention also has effects on social organization. In the case of Kenanipata, the delivery of poor and inadequate laundries to the washing dynamics of the neighbors led to a strong disorganization; nobody wants to take charge of these laundries[16].

On the other hand, in Pasankeri, the neighbors have established a commission for the social management and maintenance of laundries, which is distributed in a financial area, a collection area, and a maintenance area. They carried out this action because the municipality, upon requests for maintenance of the laundries, ruled that it was "the last maintenance they would collaborate on."

That is why the territories, together with the sub-municipalities, decided to charge the use of the laundries to pay for their maintenance. This collection is problematic and generally falls on adults who take care of these sources. Of the four places visited, only in Pasankeri the collection has been sustained under the supervision of two supervisors chosen by the proper neighborhood council.

The maintenance of the collective laundries almost always falls on the Annual Operative Plans of the neighborhood and on the washerwomen, who work in these places; an aspect that is not negative due to the considerable financial scope for the construction of these spaces. Pasankeri has monumental laundries because its construction had the support of the Barrios de Verdad [*Districts of Truth*] project. In contrast, the Kenanipata laundries, although they had the support of an NGO in the design, did not have a budget to locate a tank (key to capture the water). In addition, the management of these spaces is also related to the management of underground sources; their measurement and conservation are activities with financial implications for advice, laboratories, source mapping, etc.

The Pasankeri laundry has been financed by the Barrios de Verdad project. In the other cases, the financing has been through the Annual Operative Plan of the neighborhood (Kenanipata, San Antonio), NGO support (Kenanipata), and the counterpart of washerwomen (San Antonio) and neighbors (Valle de las Flores, Pasankeri). This data only includes attention to the infrastructure; no other investment type is known around the same sources (in their identification, preservation, recycling, etc.).

[16] "Now, [here in Kenanipata], this is stopped, we have lifted the chamber, they had made it stop, we have removed a lot of socks, this work is bad. We don't want to be responsible anymore. If it can be beautiful as we have been told, in the same project, we would have appointed someone to take care of it. But we are upset, that company has taken away a good spring. We used to wash clothes for people, now we don't wash anymore, hardly just our clothes. The water is not enough, it is little, in all the laundries we want to wash, there is no water, there is a fight for that reason" (Modesta Apanqui, neighbor and washerwoman from Kenanipata – interviewed on November 4, 2018).

The points of attention for the improvement of these spaces, according to the territories, have to do with the location of water tanks for the collection of water (Kenanipata, San Antonio); the monitoring of leaks and blockages (Valle de las Flores, San Antonio), and the protection of these spaces.

There are different project ideas regarding the springs that differ by actors. Some are aimed at reforestation and irrigation of medicinal gardens; others, to tourism by means of dancing water fountains or tourist parks. There are also those who are oriented to sports activities by means of an Olympic swimming pool, and others persist in the use for washing by means of car washing places.

With this information, a framework has been constructed that summarizes some of the study's findings.

Table 1. Springs landscape and collective laundries in four territories in the city of La Paz
Source: own elaboration

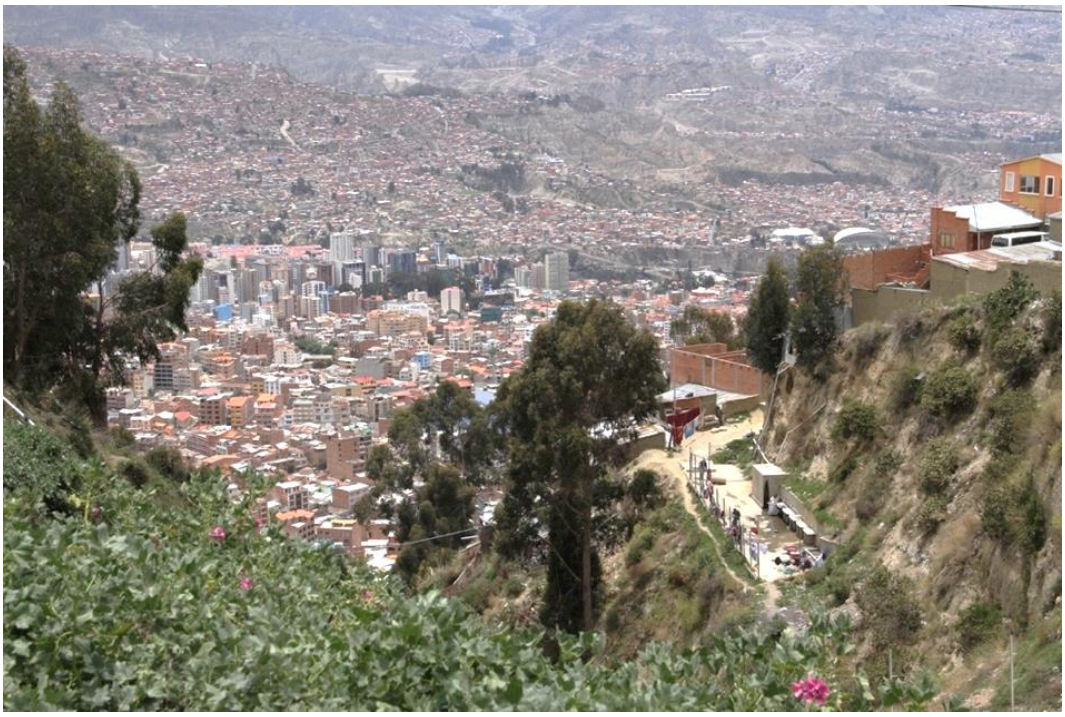
	Pasankeri	Kenanipata	San Antonio	Valle de las Flores
Location	District 4, macro district Cotahuma, western slope.	District 5, macro district Cotahuma, western slope.	District 15, macro district San Antonio, eastern slope.	District 16, macro district San Antonio, western slope.
Landscape description	Monumental landscape, with murals on the stone gabions. It has two levels of laundries in which there are platforms.	Deteriorated landscape, disused laundries. It has many plants known as "fox tail". Washerwomen have to go through a narrow path to get out of the laundries. It has a space where they intend to build a car wash.	Located in a place from where you can see the city. It is located in an area of passage and to enter this place you have to go down steps. Wide drying area, although not very visible. There is an image of the Virgin of Copacabana that denotes the degree of cohesion of the washerwomen of this place.	Landscape shows traces of the 2011 mega-landslide. It is near a destroyed square that serves as a drying area for washing visitors.
Visible persons	Laundry authorities, women and men.	Women and their children, and men who wash cars.	Washerwomen, neighbors and their children.	Women, men, boys and girls, youngsters. Some families who go to wash their clothes and spend the day, can be seen with their tents.
Social sense of the place	Model laundry, neighbors take pride in this place. Free use laundry.	Sense of fraud due to poor construction of the laundries and poorly adapted to local washing practices. Laundries for neighborhood use.	Laundries are assumed as a source of employment, after the 2016 water crisis the neighborhood values this place more. Laundries for use by the washerwomen, although not restrictive for other users.	There are laundries that have recovered from the landslide. They are a source of pride for the area. Laundries open to visitors from other areas, people from different neighborhoods come to this place.
Spring capture	Good water capture. The women studied the route of the water, the soil was waterproofed, and use plastic to harvest the water.	Capture with water loss. Loss of flow due to poor water distribution in several laundries. It does not have a water tank, it has a soapy water degreaser.	Water capture with some loss of water. The water is concentrated in a central platform and it has a water tank.	Good water capture. It has a tank, and sinks with lever taps.

	Pasankeri	Kenanipata	San Antonio	Valle de las Flores
Construction process	With communal action and architectural ethnography.	Little community participation, especially from the neighborhood council. Tensions between washerwomen and the engineer responsible for the work.	The washerwomen have managed to get construction material and have been the ones who demanded the construction of the laundries.	Community work organized by the neighborhood council.
Architectural social effects	People are happy, they just worry about the administration and maintenance of the laundries.	People are upset, nobody wants to assume responsibility to take care of the place. The decrease in flow increased the women's working hours, reduced their income and increased tensions between them.	There has been a loss of water flow, because of that the washerwomen have decided to use conventional laundries only for soaping and have allowed the water to concentrate in a main platform.	People assume this space as a recreational space, opting for this space because of the good water flow and ample space for drying clothes on the square that was demolished by the 2011 mega-landslide.
Social organization	There is a Social Management and Laundry Maintenance Commission as part of a neighborhood structure.	There were representatives before the architectural intervention. There are only visible people, but they are not representatives.	There is a representative of the washerwomen elected by a system of responsibility rotation. However, the Autonomous Municipal Government of La Paz (GAMLP) has no direct relationship with these people except through its neighborhood council.	Delegated to a neighbor for his city, currently there is no one in charge.
Funding	World Bank, Barrios de Verdad.	Annual Operative Plan (POA) of the neighborhood, participation in the design and advice of the NGO named Swisscontact.	Annual Operative Plan (POA) of the neighborhood and contribution of the washerwomen.	Annual Operative Plan (POA) of the neighborhood and contribution of the neighbors.
Maintenance of the laundries	A minimum amount is charged for the use of the laundries.	No money is charged. It was planned to make collections, but given the situation it is not done.	No money is charged. An attempt was made to do so, but this measure was discarded.	Attempts were made to charge at the beginning, but after the water crisis this was stopped.
Improvement proposals	Entangling the laundries.	Installation of a tank and checking the water capture.	Installation of another tank and maintenance in case of clogging.	Taking care of leaks because there are people who go to wash cars.
Other projects	Olympic swimming pool Reforestation	Installing a tank Car Wash	Garden/ medicinal plants Fountain	Being part of a tourist park.

Conclusions

The city of La Paz finds itself in a cycle of approach (Monclús, 2002) to its very important underground water sources. This interest results from the effects of the 2016 water crisis and the global agenda established in the SDGs, antecedents that require a greater understanding of the water territories established on the slopes of the city.

Picture 9. Collective springs and laundries: rural enclaves on the western slope of the city of La Paz
Photo: J. Dávalos, 2018



The social use of springs, for the consumption and washing of clothes, is marked by factors such as landslides and the water crisis. But, also by the presence of institutions that regulate the use of water (water cooperatives and the public water company). A harmonious landscape in this case study is also given by a good capture of underground water, the adequate construction of laundries, and social participation in the issues of spring management.

The washing of clothes in the springs is an alternative to the denial of washing at home, mainly to tenant families. But it is also a resistance to washing clothes at home where laundries have been miniaturized. It is also a resistance to assume that drinking water coverage supposes the disappearance of these sources because springs are part of the ecosystem of daily activities such as washing clothes.

Overall, the urbanization of water has led the population on the slopes to abandon the management of the resources and concentrate on managing laundries. This has implications for the conservation of these sources. Adding to this trend is a legal vacuum "where the competence of the water resource is actually the competence of the central and local governments that are incompetent to manage this resource" (Daniel Marka, Urban-Rural Development Unit. Workshop December 19, 2018).

If the following recommendations are assumed, a cycle of approximation of the municipality with its underground sources that make up the water identity of La Paz would be produced.

- It is important to carry out research on the springs, inventory them, and classify them[17] to determine their spatial value and establish soil destinations, recovering the water memory of many neighbors who regret how some flows were channeled with sewer water. This task must articulate institutions of the national and municipal government.
- Social management of springs and laundries should be promoted. A summit on both would be important to address these issues and to see the difference between protection of these sources and their privatization.
- The design of architectural objects in the landscape could be improved on the basis of the knowledge and washing practices developed by women in the springs (for example, the ergonomics of washing heavy things with the feet or the knowledge of the use of flora in washing).
- In the framework of the autonomic process, the municipality of La Paz should consider a legal analysis on the creation of regulations regarding springs, so that resources can be allocated to these and to the laundries. Because until now, the Annual Operative Plans of the neighborhoods have not been able to answer all the problems. The modification of the Municipal Law of Urban Land Use[18] for a specific use for the collective washing of clothes can be an intermediate alternative to the challenge of advancing the approval of a national water law which, due to a conflict of interests of different actors, has not been adjudicated to date.
- The springs are part of the urban image of the municipality. It is necessary to recover and generate a culture that recognizes the hydrological identity of the city of La Paz and the conservation work that the hillside territories do, which would serve as part of a cycle of approach to these spaces in a context of climate change.
- The image as a tool to detonate public policies, as well as for the production of knowledge, can be exercised in the academia, within the framework of transdisciplinary studies, and also by the same territories.

The municipality of La Paz has a hydric identity of underground water, good quality fresh water. Its care, preservation, and sustainable management is necessary for daily life and for the challenge of building sustainable urban territories.

[17] Solange Murillo, Municipal Secretariat for Risk Management, Presentation workshop on research progress and social consultation (December 19, 2018).

[18] Daniel Marka, Urban-Rural Development Unit. Presentation workshop on research progress and social consultation (December 19, 2018).

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