The intersections between infrastructures and expectations: repair and breakdown in Yachay, the city of knowledge in Ecuador*

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ABSTRACT

This paper explores the temporalities of infrastructuring, breakdown, and repair/disrepair interacting generatively – materially and symbolically – in “Yachay, the city of knowledge,” the most ambitious and controversial public infrastructural project in Ecuador’s history. I analyze the roles of expectations, and the infrastructural dynamics in the process of shaping Yachay during its intragovernmental scaling-up from a technical university to a city of knowledge; and during the material implementation of some of its basic physical infrastructure. I also highlight the embeddedness of the expectations in particular pasts and historical trajectories, thus extending the common use of expectations as only oriented to the future. The argument presented here draws on fieldwork conducted in Yachay for 14 months between 2016 and 2018.

KEYWORDS
Yachay; temporalities; Ecuador; expectations; infrastructures

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RESUMEN
Este documento explora las temporalidades de la infraestructura, la avería y la reparación / deterioro que interactúan generativamente, material y simbólicamente, en “Yachay, la ciudad del conocimiento,” el proyecto de infraestructura pública más ambicioso y controvertido de la historia de Ecuador. Analizo los roles de las expectativas y las dinámicas infraestructurales en el proceso de conformación de Yachay durante su escalamiento intergubernamental de una universidad técnica a una ciudad del conocimiento; y durante la implementación material de algunas de sus infraestructuras físicas básicas. También resalto la incrustación de las expectativas en pasados y trayectorias históricas particulares, extendiendo así el uso común de expectativas entendidas como una orientación hacia el futuro. El argumento presentado aquí se basa en el trabajo de campo realizado en Yachay durante 14 meses entre 2016 y 2018.

1. Introduction

This paper explores the temporalities of infrastructuring, breakdown, and repair/disrepair interacting generatively – materially and symbolically – in “Yachay, the city of knowledge,” the most ambitious and controversial public infrastructural project in Ecuador’s history. Yachay, the city of knowledge, is a publicly funded regional innovation system, inspired by the buen vivir paradigm and the triple helix model, i.e. focalized cooperation between public, private, and academic actors and resources-oriented towards innovation (Etzkowitz and Leydesdorff 1995; Leydesdorff and Deakin 2010; Park 2014). Located in the province of Imbabura, in the north-central region of Ecuador, Yachay aims to combine a planned city, a technopark with a business orientation, and a research-oriented public university already in operation (“Yachay Tech”) with approximately 1240 students. According to its designers, the project is oriented to generate a new economic pole for Ecuador based on knowledge production rather than exporting commodities, thus challenging centuries-old socioeconomic problems. The intervention area is of approximately 4200 ha, and it is projected to be developed within 35 years into the future (see Figure 1). Yachay is being

1 “Sumak-kawsay” is considered a part of an ancient Cosmovision of indigenous communities in the Andes, across Ecuador and Bolivia, pointing to the ethical and epistemic ways of understanding and relating to humans and non-human entities within the standards of living a good-plentiful, balanced in regard to nature, community-oriented life (Acosta 2013; Dávalos 2008). The “buen vivir” paradigm is inspired in sumak-kawsay and has been consecrated in Ecuador’s constitution, developed in 2008, as Ecuador’s political, economic, and cultural guiding principle. Buen vivir is one possible translation of sumak-kawsay among other possible ones such as “vivir en plenitud” (to live in plenitude), “la vida en plenitud” (life in plenitude) (Macas 2010). Yachay has been referred to as “una Ciudad del buen vivir” (a city of good living) (Clave 2014) or as setting the conditions to achieve Buen-vivir (IFEZ-Ecuador 2013). The name Yachay itself is a word in Kichwa-Quichua, one of Ecuador’s indigenous languages, which may be translated as knowledge or wisdom.

2 From now on, the article will refer to the project “Yachay, the city of knowledge” only as “Yachay.” It will specifically refer to the public company in charge of the construction of the project as “Yachay EP” and to the University as “Yachay Tech.” The author has decided to do this to avoid confusion and be clear with the developed descriptions. Media in Ecuador has constantly equated the EP with the University and has used the terms interchangeably rather carelessly, this has resulted in problems of public representation of the two, surrounded by controversies and the intent from both institutions to draw a more apparent distinction between them (see for example, Hora 2018; Rivadeneira 2018; Rodriguez 2018; Telégrafo 2017). The University and EP are different institutions, with different missions, different action plans, and, importantly, they respond to different regulations. Yachay EP’s purpose is to provide the necessary infrastructure for the project, including Yachay Tech, and it responds to the regulation of the National Coordinator of Public Companies of Ecuador. On the other hand, Yachay tech responds mainly to SENESCYT.
built officially since 2012 but, as I hope to show in this article, its history expands into a deeper past embedded in the political, public policy and economic changes implemented by Rafael Correa’s administration since 2007 and the broader changing contexts.

According to the Ecuadorian government at the time, Yachay’s primary goal was to become a city devoted entirely to research, innovation, and the production of a variety of high-tech commodities and services (Yachay 2012a). The plan was to accomplish this goal by clustering the entire project in one place, bringing together actors and institutions from the private, academic, and public sectors. If the expectations mobilized around Yachay came true, Yachay would enable the transition from an economy historically reliant on the extraction and exportation of raw commodities to an economy based on the generation of knowledge-intensive technologies and systemic innovation. Resonating in this way, at some point, Rafael Correa’s administration defined the government’s ultimate goal: a radical change in the productive matrix of the country. Hence, Yachay’s future-orientation and the imaginaries constructed around it were in part related to the particular conceptions of the country’s past

3At the time the project emerged, Correa argued that Yachay was “the most important project for Ecuador in the last 100 years” (Yachay 2013a) and on the day of inauguration of Yachay Tech he made quite an ambitious affirmation that pointed to the revolutionary character of the objectives pursued in Yachay:

an Ecuador that projects itself into the future as a sovereign country that has decided to base its development on the only inexhaustible source of wealth: human talent, knowledge … today begins another boom, that of knowledge, which will last forever because it is an unlimited resource. (Rafael Correa, Ecuador ex-president, 31 March 2014. Translation is mine)
developed during Correa’s government (where a political void in the near past fed the ideal of a promising future with innovative answers), but also their development has been shaped by several other dynamics like political disputes with different political actors, including the current government.

Internal dynamics, disruptive events, and economic, political, and sociotechnical shifts have left the project at the center of a political struggle between Correa’s administration and his successor Lenin Moreno. This has led the project to stagnation, down-scaling, legal dispute, and uncertainty regarding its future (see Figure 2). In this article, I analyze the early trajectory of Yachay by focusing on two entry points at different moments in the projects’ life while embedding the project’s trajectory in Ecuador’s broader contexts at stake. To understand the complexity of its configuration, I examine the roles of future-orientation and past configurations shaping the project in these two different moments.

This paper connects the literature on infrastructures with the literature on expectations. The intersection between these two fields remains understudied in the context of technocities and high-tech urban assemblages – despite the proliferation of a variety of planned high-tech urban configurations and interventions worldwide (see for instance, Angelidou 2015; Joss 2010; Kargon and Mollella 2008; Raco, Durrant, and Livingstone 2018) (and for critical perspectives, Datta and Shaban 2017; Marvin, Luque-Ayala, and McFarlane 2016; Massey and Wield 1992; Moser 2015). Moreover, it becomes particularly relevant in
contexts like Ecuador, and more widely Latin America, where historically there has been “an infrastructural gap” with respect to the needs of the region, and a tendency of infrastructural breakdown and disrepair influenced by drastic oscillations in public budgets, the direction of public policies, and constant political turmoil many times influenced by external intervention (Kogan and Bondorevsky 2016; Perrotti and Sánchez 2011). This article analyzes the roles of expectations and the infrastructural dynamics in the process of shaping Yachay during its intragovernmental scaling-up from a technical university to a city of knowledge and during the material implementation of some of its fundamental physical infrastructure.

The article uses the concept of expectations to illustrate the ways in which futures are increasingly mobilized as resources in technological development and scientific practice to draw attention and legitimacy, attract economic and administrative resources, coordinate action and agendas, and materialize imaginaries of the future in the present (Borup, Brown, and Konrad 2006; Konrad 2006; van Lente 1993; Wilkie and Michael 2009). Nonetheless, I also highlight the embeddedness of the expectations in particular pasts and historical trajectories, thus extending the frequent use of expectations as only oriented to the future. This extension is connected with the current call (Edgerton 2008; Murphy 2013) to infuse futuristic innovation-centred analysis of technological projects with historical depth and complementary reflections around the uses of the old and the generativity of the past in techno-social dynamics. This article discusses the literature of expectations within the broader framework of temporal politics and the social politics of time (Bastian 2014; Huebener 2015; Rufer 2010; Sharma 2014), a theme that remains understudied within the analysis of Ecuadorian politics and more generally in the analysis of Rafael Correa’s 10-year government.

To avoid falling into the rhetoric surrounding what authors have called “the hype cycles” or “technological hyped dynamics” (Alvial-Palavicino and Konrad 2019; Dedehayir and Steinert 2016), understood as the sequential appearance of periods of hype, disappointment, and recovery in the life of new technologies, technological, and scientific fields or techno-social projects (Borup, Brown, and Konrad 2006; Van Lente, Spitters, and Peine 2013), the article will not analyze Yachay under the rhetoric of the success–failure spectrum. Instead, it will analyze the uses and the effects of expectations in two different moments during its development. It focuses on how expectations are used as vital resources in the development of a sociotechnical project from its legal substrate to its physical infrastructures; and how expectations connect the actors involved and the broader contexts at stake – drawing on the data collected during fieldwork in Yachay in different periods from 2016 to 2018, along with document analysis. The article starts by discussing the methodological approach, followed by the conceptual framework, findings related to the historical and economic contexts, and finally, general reflections and future lines of research.

This approach differentiates this article from previous research on Yachay, which has used a language more related to the success/failure dyad. See for example how Fernández González, Cadenas, and Purcell (2018), use of the utopic/dystopic dyad to compare what they call the project’s utopic imaginaries with the failure of its “reality” based on their “impossibility” of doing ethnography in the project. It has to be noted that the success–failure dyad has been used to describe the project by both its promoters and its chief critics, even when the project is still under construction having covered less than six years of a projected 35-year span. The author decided to avoid this type of rhetoric in order to focus on aspects which may remain out sight if one seeks to collapse the complexities of the project’s dynamics into a success or failure judgement.
2. Methods

The argument presented here draws on fieldwork conducted in Yachay for 14 months between 2016 and 2018, in 2 different moments: first, when Rafael Correa was still president, and the second, after Lenin Moreno had entered office in 2017. The aim was to trace the life of the project through different moments from its initial design, planning, and emergence into its implementation and subsequent reconfigurations. For this, this research draws on the Biography of Artefacts and Practices (BOAP) approach (Hyysalo, Pollock, and Williams 2018; Williams and Pollock 2009). Used methods include non-participant observation in both of Yachay EP’s offices in Quito and in the location of the project in Urcuquí, and 80 in-depth interviews conducted in different locations across Ecuador, in Belgium and through video-calls.

These interviews were conducted with a variety of actors implicated in the project at different temporal points. The interviews included current and previous authorities and public servants from Yachay EP (the public enterprise in charge of planning and building the infrastructures of the city of knowledge) and Yachay Tech (the research-oriented university planned to be the heart and motor of the project), students, local community members and leaders, entrepreneurs, local, and national authorities. These were complemented with document analysis of public and private records and archives, and observations of the project’s development from its beginnings and throughout significant events that have shaped it.5

3. Conceptual framework

Currently, anticipation is studied across disciplines and applied to a diversity of objects of study ranging from biology, the mind, and cognitive systems (Clark 2013; Friston 2010; Friston, Adams, and Shipp 2013; van Dijk and Rietveld 2018) to social systems such as finance and politics (Amoore 2009, 2013; Esposito 2013; Mackenzie 2017). One of the basic ideas around anticipation is the notion that not only the past(s) but also the future(s) have generative power and can shape the present. That is to say, an ongoing and proactive relation to future(s) in the present allows those futures to have generative power despite that, in principle, they cannot be fully predicted and anticipated (Cevolini 2016; Poli 2010). Thus, “an anticipatory behaviour is a behaviour that ‘uses’ the future in its actual decisional process” (Rosen quoted in Poli 2014, 17). This paper focuses on the strategic use of futures in decisional processes.

In Science and Technology Studies (STS), anticipation has been studied with the practice-oriented approach that characterizes the discipline (for future as practice in STS, see Alvial-Palavicino 2016) through a variety of case-studies analyzing the dynamics of expectations (Borup, Brown, and Konrad 2006; van Lente 2012), predictions within promissory

5I hope this research, as well as Chavez and Gaybor’s research (Chavez and Gaybor 2018), shows the dangers of over-generalizing specific investigative experiences and extracting from them universal conceptual truths. Such as the ones promoted by Fernández González et al. in their article about Yachay in which they state that: “we consider that urban projects of this scope require denying or obliterating both citizen participation and scientific research on the planning and construction process of the new city” (Fernández González, Cadenas, and Purcell 2018, 343). Hence, our respective investigations contradict their central thesis about Yachay’s “prohibition of research” which they frame as a “governmental rejection to knowledge and participation in the macro project as a sine qua non condition for the political exploitation of the urban utopia” (Fernández González, Cadenas, and Purcell 2018, 355).
work (Pollock and Williams 2010b, 2015), and sociotechnical imaginaries (Jasanoff 2015; Jasanoff and Kim 2009). For instance, the use of predictions in the shaping of technological and service markets by industry analysts and technological forecasters (Pollock and Williams 2010b, 2015); analyzing their use in the shaping of synthetic biology by a variety of actors and institutions (Schyfter and Calvert 2015); their influence in the interactions and applications of academic practices and knowledge in the business sector and in the realms of law (Juhl and Buch 2018; Pickersgill 2011); mapping a variety of possible futures promised and contested in different waves of scientific and technological development in fields such as artificial intelligence (Galanos 2018); in the neurosciences, particularly around future neuroimaging and neuromodulation capabilities (Rusconi and Mitchener-Nissen 2014); and in sustainability transitions based on the development and expansion of renewable energy projects and hydrogen storage technologies in the US and China (Bakker, Van Lente, and Meeus 2011, 2012; Korsnes 2016). Interestingly, anticipation and expectations have also been explored as powerful tools around which scholars and social movements can rethink and rework meaningful relations with both futures and presents as political nodes (Adams, Murphy, and Clarke 2009; Esguerra 2019).

3.1. Anticipation and infrastructures

Temporality and anticipation have informed the study of infrastructures through the analysis of design and planning practices that embody in the present long-term visions of durability, stability, or innovation (Abram 2014; Connell 2009). According to STS scholarship, infrastructures are material and symbolic networks that support various kinds of agency, transportation, and flows by providing contingent stability to social phenomena; granting a temporary order to communication and coordination across time and space while remaining mutable and, in many cases, hybrid (Edwards 2003; Larkin 2013). Innovative infrastructures often "require novel responses in human organization, technical support, and institutional reform" (Ribes and Finholt 2009, 394) while also acting generatively by sustaining new arrangements with unpredictable effects (Amin 2014; Jensen and Morita 2015). Importantly for this paper, infrastructures develop through a process that involves a variety of knowledge and work, setting foundational elements in the present that incorporate long-term visions and expectations of future use/effects through an active process described as infrastructuring (Bossen et al. 2014; Pipek and Wulf 2009).

Moreover, current accounts of infrastructures have moved beyond the classical Northern-European and North American cases and started to study these dynamics in other parts of the world. These studies have highlighted characteristics such as the heterogeneity of infrastructures in cases where uniformity in access and constant availability of water, waste infrastructure, sanitation, electricity, and other taken-for-granted resources are not the rule (Furlong 2014; Lawhon et al. 2018). Accordingly, these scholars have focused on aspects such as the fundamental role of maintenance/repair in sustaining operating infrastructures in different sociotechnical spheres and geographies (Graham and Thrift 2007; Sormani, Bovet, and Strebel 2019). Furthermore, they have also pointed towards the constant danger of breakdown that can often end in disrepair/decay of infrastructures, illustrating their contingency within challenging political and economic settings (Jensen and Morita 2015; Schwenkel 2015). Processes of maintenance/repair, breakdown/disrepair constitute particularly strong empirical and analytical observational
points to develop an integral understanding of the complicated dynamics of infrastructures which at times become visible or evident only “upon breakdown” (Furlong 2014; Graham 2010; Howe et al. 2015; Pipek and Wulf 2009) and the order of which is always vulnerable and contingent.

Nonetheless, although temporality and anticipation are part of the scholarship in infrastructures, this article argues that the concept of expectations can help capture more thoroughly the temporal complexity in projects as Yachay that are situated in highly unstable contexts where the processes of maintenance/repair, breakdown/disrepair have shaped the project from the beginning.

3.2. Anticipation and expectations as more than futures

In the literature, expectations are mainly understood as “real-time representations of future technological situations and capabilities” (Borup, Brown, and Konrad 2006) and have been analyzed mostly in their relation to the future (Brown and Michael 2003; Eames and McDowall 2010; Tutton 2011). This paper aims to develop a vision of them in a complementary but fragmented relationship with the past. Hence, this article proposes the possibility of understanding expectations not only about the future but also in relation to the past. That is, expectations as interfaces where representations and observations of both futures and pasts interlock, allowing for the emergence of meaningful and actionable presents (for specific actors). In other words, this article suggests the possibility of understanding expectations not only concerning the future but more integrally as temporal interfaces related to the modulation of both pasts and futures. An interface that is opened continuously in the present and makes visible how modes of observing the future are linked to ways of observing, representing, mobilizing, and, hence, actualizing pasts.

In this sense, expectations can be thought of as an interface in which pasts and futures are modulated and negotiated: actualized. Hence, for every present, the interrelation between pasts and futures is readjusted (consciously and unconsciously), and a shared actualization of meaning and possibilities for action is shaped through expectations (Fuchs and de Jaegher 2009; Leydesdorff 2009; Luhmann 2006; Miller and Clark 2018). If one understands time as the “interpretation of reality with regard to the difference between past and future” (Luhmann 1976, 135), then one can analyze the current representation of temporal flow as portraying an ever-growing past that is paradoxically generating, ending-in and being fed by a fleeting present, from where a never completely knowable future can be observed. The societal tendency towards the generation of novelty and the focus on futures generates as its counterpart a present that is continuously becoming past, a novelty steadily becoming already known (Luhmann 2000). Hence, an interpretation of the world as always tending towards novelty, always young, but also and for those same reasons, always already old, immediately becoming a point of reference in the past for the next present. This is an ongoing process in which both pasts and futures are part of a more fundamental temporal dynamic, a relational structure of time. A dynamic in which what we know of the past, how we represent it, and how it is made relevant for the present situation or the anticipation of futures, is continually interacting and is being actualized hand in hand in the present, with the emergence and disappearance of expected futures.
This framing allows us to understand future-making practices not only centered on novelty and futuristic modeling of technologies and arenas but also on how those same processes are influenced by and influencing how the past is observed, represented, and made actionable in the present. Expectations in this sense are oriented not only towards how the future is going to be configured but also to the elements of the past that will become part of the future or not, and how. This is particularly important in projects in which sociotechnical imaginaries are focused on developing not only particular technological artifacts or services, but on constituting complex spaces where specific types of knowledge are expected to be produced in the future whereas specific pasts are [represented as] coming to an end (Merz and Sormani 2016); as in the case of Yachay.

4. Findings

4.1. A brief introduction to Ecuador’s contexts

When Rafael Correa Delgado assumed the presidency of Ecuador on 15 January 2007, the country was coming out of a decade of political instability reflected among other things in having had 12 presidents in 25 years since the return to democracy in 1979. Of those 12 presidents, 7 had been in the last 10 years. Of those seven presidents, three of them were overthrown. During the last century, Ecuador experienced, on the one hand, constant turmoil and instability in the political sphere (Pachano 2004), while, on the other hand, the most prominent economic groups related to the ownership of the land and exports of primary commodities such as cacao, banana, or coffee, and to the large commercial and banking conglomerates that consolidated since the 1960s, maintained a stable dominance and influence over public matters (Checa-Godoy 2012; Vanoni and Rodriguez 2017). The result was a steady and growing social inequality in terms of the distribution of land, income, and assets, which Correa’s government inherited and was not able, or willing, to transform. For example, despite being able to reduce poverty, particularly between 2007 and 2014, and improve access to education, social security, and health, income inequality and land concentration did not improve significantly (Daza 2018; Larrea and Greene 2018; Martínez 2014).

Correa’s and Alianza País’ political domination was based on an unparalleled electoral force winning 10 elections between 2006 and 2017, in which his party obtained the majority of the vote. These victories assured him at the same time an overwhelming political hegemony and the possibility to sustain and project his government’s public policies through time. This stability was achieved through the political domination of the party, centralized in the figure of Rafael Correa. This was expressed and sustained, on the one hand, through electoral victories, and on the other, in the expansion and strengthening of the state in administrative, communicative, and economic terms. It also emphasized communication dominance, as some parts of the privately owned media became one of the main oppositional forces, threatening the perceived stability (Cerbino, Maluf, and Ramos 2017; Kitzberger 2016; Viatori 2013).

This political stability was also achieved through time by a period of economic growth and stability despite periodical problems. However, it was still attached to a high dependency on oil exports and a low-economic diversification. Based on reforms to the previous laws regulating oil extraction, a renegotiation of the public debt and a high price in
international oil prices, again with problematic periods, the state enjoyed higher incomes, and the role of the state in the national economy became even more central. Against this background, Yachay emerged publicly in the middle of the 10-year period, when the government was entering its “second stage” oriented towards the “change in the productive matrix”, and when the 2017 elections were already in the horizon. It was poised to embody the long-term planning made possible by the stability in government and economic prosperity, to become a breaking point with the historical economic matrix and provide political support in a way that could secure, or at least strengthen, the position of the party facing the 2017 elections. In a way, Yachay became the setting where expectations regarding the breakdown with extended pasts, the extension of a stable present requiring constant maintenance, and the emergence of a promised improved future society, met with constant friction and tension among them.

For instance, this is how the project was described back in 2012 in one of its presentations to the public:

Yachay (which means to learn or to know in the Kichwa language), City of Knowledge, is the flagship project, which will transform the productive matrix and turn the country into an exporter of knowledge and technology. (Yachay 2012c, 11)

4.2. First entry point: the emergence of Yachay and its scaling up

When I started to investigate the historical trajectory of the project, it quickly became apparent that at specific times in its history the project had taken a variety of forms as it became increasingly institutionalized and gained the attention, support, and credibility from different authorities and groups within the government. These forms ranged from a highly intellectual initiative supported by a small group of people within the government to an established public enterprise with a robust budget and managerial independence from the institutions in which it was born. These movements and transformations were made possible by a combination of projected expectations (showing and arguing what the project could become and what it could change in respect to the past) that were sustained in a variety of narratives, public policies, and legal apparatuses. I now describe briefly these dynamics and how they allowed for legal, administrative, and political infrastructures to be formed around the project.

4.2.1. Legal, administrative, and political infrastructures

This section describes how Yachay emerged from a process of transformation within the Ecuadorian state, supported in a variety of legal and institutional infrastructures that were put in place during Rafael Correa’s administration to reconfigure what was already there. Also, it describes expectations used to build new commitments, institutionalize the project, gain political support, and mobilize resources within the government. Previous academic accounts on Yachay have located the origin of the project in 2012 when according to certain authors the construction works started (Fernández González, Cadenas, and Purcell 2018, 236), or also in 2010 with a visit of ex-president Correa to South Korea’s Inno-polis Daedeok (Chavez and Gaybor 2018, 1). Here the argument pursues a different narrative that analyzes the very early negotiations and scaling up process of the project, which happened during the design of Yachay within the Ecuadorian government. In addition, I
describe how elements of specific actors’ pasts and envisioned futures were mobilized to inspire and be part of the design of the project; hence, illustrating other sources of inspiration for the design of Yachay different from the South Korean model highlighted by Chavez and Gaybor (2018) as Yachay’s primary reference.

Similarly, another aspect that connects Yachay to a more extended timeframe into the past and situates it within the reconfigurations of a more extensive public policy system, are Yachay’s connections to a series of legal infrastructures implemented early on during Rafael Correa’s government. Yachay was embedded in and supported by the normative transformations of the Ecuadorian state, ranging from the implementation of new legal infrastructures as the 2008 national constitution and the design of the 2010 LOES (Organic Law of Higher Education). Likewise, it emerged within the establishment and reconfiguration of governmental branches such as SENPLADES (National Department of Planning) and SENESCYT (National Department of Higher Education, Science and Technology). Accordingly, the project’s trajectory has been continuously reshaped by different actors that have been part of its history at different moments. These actors, coming from different backgrounds and institutions, brought their perspectives, motivations, interests, expertise, futures, and pasts into the project’s dynamics.

One of the most significant changing contexts in which Yachay emerged was Ecuador’s reforms implemented in the realms of education and science and technology policy from the beginning of the Correa government. A range of reforms and programs were implemented; among them, the Prometeo post-doc initiative (SENESCYT, n.d.; Van Hoof 2015), public financing of national and international scholarship programs, reforms of both planning and regulation institutions such as SENASCYT/FUNDACYT, the creation of a national plan for development, public research funds, and the construction of new educational infrastructures in the form of new schools and new universities (for a systematic overview and a historical comparison see Herrera-García (2018) and Chavez (2017a, 2017b)). These reforms were connected to ex-president Correa’s view, based on his personal experiences and trajectory within that system, and his political motivations, where Ecuador’s education system, and its lack of connection with the generation of science and technology policy, was one of the main barriers stopping the country from achieving greater wealth and well-being. In his eyes, it was too fragmented, overly privatized and almost entirely teaching-oriented, leaving research as a peripheral activity. In his words:

All my life, before being a politician, I was an academic, I had the opportunity to study in Ecuador and teach in many Ecuadorian universities. Thus, I know very well the Ecuadorian University, and I had the opportunity to study in Europe, in Leuven, and afterwards, I was in the United States. I know that our university system was terrible and I know where the problems were. In the twentieth century, the countries that develop the most are not those that have the most land and natural resources; they are the ones with the best human talent, science, technology and innovation capacity. For that, we need first level Universities, while Latin America does not improve its level of universities we will not overcome underdevelopment. (Correa 2018)

Of course, this was not only his perception. Ecuador’s education system had problems inherited from previous decades. His specific interpretation, which highlighted certain aspects and left others aside, was a vital component of this framing as he was the acting president and his influence across the government and in Alianza País could
hardly be overemphasized (Basabe-Serrano 2009; Meléndez and Moncagatta 2017; Ospina 2011; Polga-Hecimovich 2013). Hence, this depiction of the past was one way of interpreting it in order to make decisions in the present, and in that way mobilizing specific forms of representing pasts to explain present conditions, and by doing so, setting the arena for future-oriented actions. These representations implied highlighting certain aspects of the past and leaving others aside, in order to generate a connection with a present in which Correa’s party had both the political dominance and the economic resources to implement changes in public policy. These changes were oriented towards the reconfiguration of the Ecuadorian state and to transform its historical interrelation with other social spheres such as academia, social movements, and mass media (Becker 2013; Lemos 2014).

In this sense, expectations of what would be Ecuador’s education system in the future were inseparable from those representations and mobilizations of pasts. Those interpretations of the past allowed the emergence of meaningful lines of action, for certain actors, in the present, which would allow the future to emerge as different from those pasts. Hence Alianza País’ insistence on the new country they were creating. See for example the slogans often used during campaigns and political events:6 “la Patria Nueva” (the new homeland-motherland) or “Ecuador ya cambió” (Ecuador has changed), “el futuro no se detiene” (the future cannot be stopped).7 Also, in the plan of governance of Alianza País:

Let’s fight all together, compañeros and compañeras! So November 26, 2006, is a new historical date, the birth of a new Homeland to demolish the old structures, as a previous step to the construction of a different society; make no mistake, the urgency of change is historical and subversive, because we are not interested in maintaining the current state of affairs. (Alianza País 2006, 14)

However, this was not coined by Alianza País in a vacuum. It resounded with the political struggle of a variety of social movements and organizations from civil society that demanded: “Que se vayan todos” (all (politicians) leave!). This political imaginary of pursuing and demanding a future “clean slate” from which to restart, connecting political mobilizations of historical memory, has a long history in Ecuador (Amorebieta y Vera 2017) but this is not the topic of this article.

The idea is to highlight that expectations were acting more as interfaces between pasts and futures, rather than only being directed to the future. In a way, expectations can also be read as interpretations of how the past could or, in other cases, “must” have been, in order to explain or justify a present. A present, that when mobilized for collective action is no longer just a personal “now,” but an emergent resource for political action which specific actors, in this case, president Correa and his government, use to mobilize whole temporal horizons (a partially stabilized way of reading social reality through the lens of the difference between pasts and futures).8 This is part of what Rufer, Sharma, and

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6In fact, in Alianza País’ government plan developed for the 2006 elections, this can already be seen at play. In one of the main titles of the document it can be read: “¡Porque Otro país es posible! Un primer gran Paso para la transformación radical del Ecuador” (Alianza País 2006, 2) (“Because another country is possible! A first significant step for the radical transformation of Ecuador” – author’s translation).
7A collection of videos using these slogans can be seen in this Youtube channel (Ecuador Ya Cambió, n.d.).
8Interestingly, Correa’s government is now framed as the immediate past with which the current government has to break, and its legacy is under continuous dispute. While many of his followers and himself continue to refer to it as “la década
others have referred to as temporal politics or the social politics of time (Huebener 2018; Rufer 2010; Sharma 2008).

For Correa’s government, its primary reference regarding the past was what he often referred to as “the long neoliberal night”, which in discourses was situated during the 1990s and early 2000s but could often be extended into the 80s. Correa’s victory in the 2006 elections was supported by a variety of social movements which gathered around him and mobilized among other things the national constituent assembly. Furthermore, the indigenous political movements, both the political party (PACHAKUTIK) and a number of civic organizations, were instrumental in establishing “buen vivir-sumak kawsay” as one of the ideological axes for the constitution – also reflected on the national development plan (Becker 2011; Kauffman and Martin 2013; Walsh 2010). In the previous decade, the indigenous movements, partially consolidated around CONAIE (Confederation of Indigenous Nationalities of Ecuador), led the street mobilizations that ended up overthrowing two governments, shaping in this way the political landscape and positioning the need for a political restructuring of the country, around which Alianza País would emerge as a contending force (Jameson 2010; Lalandier and Peralta 2012).

Regarding education, this decade saw the emergence in Ecuador of a high number of privately owned profit-oriented universities, mostly unregulated by the state (Cielo 2019, 61). During this period, public investment in public education institutions was constrained, especially funding for research. From 2007 onwards, Correa’s government introduced more significant investment of public funds into higher education, as well as a stronger regulatory framework characterized, for example, by university evaluation and accreditation by governmental institutions. In the words of one of the interviewees who was at that time a key actor in the evaluation process: “We wanted to enter a depuration process of the higher education system” (Public Authority 1, personal communication, 2017).

This strengthened interrelation between the state and universities set limits to the autonomy of higher education institutions, both public and private. One of the main aspects of these educational reforms was the acceleration which accompanied many of these changes, as the goal was framed in achieving structural long-term changes which generated visible and significant results in a short time-frame. This can be seen in the intensive nature of these policies and in the variety of policies applied to achieve short-term impact: programs for national and international scholarships, the Prometeo post-doctoral fellowship program, the general evaluation of the whole higher education system, the introduction of a new law of higher education, and the creation of four new emblematic universities, among others. Nonetheless, sustaining both these short-term and long-term horizons, and achieving them, was particularly problematic in a context of high economic fluctuation and structural political instability. Government authorities close to Correa, and the ex-president himself thought that generating a state-led rapid change in the existent higher education system would trigger a more substantial transformation of the Ecuadorian society as a whole into the future.9 This focus on the
educational system led to the creation of four new “emblematic universities,” one of which was a technical research-oriented university which would later, after reconfigurations, become Yachay Tech. During our interview, ex-president Correa framed this connection between a transformed educational system in the future and the goal of triggering a more structural transformation, relating it with his personal experiences in the following way:

The strength of the United States is its universities; I studied there, which generate science, technology and capture the best brains in the world. The greatest strength of the United States is technological strength and innovation, hence the financial and military strength. That is the key to development, I always knew, from the beginning our effort was to improve education at all levels … I knew Louvain, my dream was to make a university like that in Ecuador, but we were not fooled either: there are priorities, I know that this can offend many, I am a social scientist, but with scarce resources, you must have priorities. We invest in hard sciences; we need hard sciences more than philosophy. Therefore, a University oriented to hard sciences. (Rafael Correa Delgado, personal communication, 2018)

As we can see, the transformations and the expectations regarding an improved educational system were not only tied to ambitions about the future and the application of foreign models, but also to specific ways of understanding and mobilizing the past, previous conditions and what authorities considered to be the existent conditions in Ecuador’s education system. Hence, both pasts’ futures were combined to trigger the emergence of a present that “demanded” action or at least one in which specific actions made sense to certain actors.

This is the case of the formulation of the 2010 LOES, which at the same time established how already existing universities would be evaluated and regulated, and those that failed the process would be closed, as well as stating the future construction of the four “emblematic” universities legally. The investment of substantial public resources in the creation of these universities would become one of the sources of tension between the central government and the higher education institutions as many academic actors considered it a sign of contempt for the existing universities, their experience, and human resources (Chavez and Gaybor 2018; Villavicencio 2014). Many of these actors argued in favor of using those resources to improve the existing universities and the higher education system, but the LOES declared a wide-ranging evaluation for the whole university system, foreclosing in that way the possibility to invest that amount of resources in Universities that would have to be evaluated in the subsequent years. Additionally, the ex-president and other actors from the government sustained a vision, which is connected to a recurrent foundational narrative, in which “the concept was: it is better to start from scratch doing it well than to try to fix what is already wrong” (Rafael Correa Delgado, Personal communication, 2018).

This focus on education was already present in the 2008 constitution, which denominated education as a constitutional right, of primary importance for public policy and a strategic resource in order to achieve Buen Vivir (Ecuador 2008 Art. 26). The constitution was recognized by Alberto Acosta, who served as the president of the Constituent Assembly during the making of the 2008 constitution (Acosta 2008). This can also be traced in Alianza País’ government plan of 2006 in which education was already positioned as one of the most prominent pillars of the promised transformations (Alianza País 2006, 59–62).

10 During 2014, 14 Universities were closed after the evaluation process, and the authorities from the new government confirmed in 2017 that they would not be reopened.
would serve as a political infrastructure and legal base for implementation of several projects, introducing new regulations, public policy programs, and physical infrastructures, among them the project that would eventually become Yachay.

The government started to roll out a reform of the previous Higher Education Law, based on one of the new 2008 constitution’s transitional dispositions (number 20) (Ecuador 2008). Based on these mandates, the government planned to restructure the regulation and the guiding principles of Ecuador’s higher education system and conduct a general evaluation of the existing Universities. Official debates in the National Assembly about the new proposed Organic Law for Superior Education (LOES) were in place during 2009, the specific dates appearing in the document are the 12 and 17 August 2009 (Ecuador 2010). Nonetheless, the LOES was already being discussed and drafted within SENPLADES and other governmental arenas.

4.2.2. Infrastructuring Yachay

One of the critical points of the LOES to understand the infrastructuring of Yachay is one of its transitional dispositions, number 15, which would eventually get published (Ecuador 2010). This prohibited the creation of any new University in the following 5 years after the promulgation of the law, with the exception of four government-funded universities, one of which was described as: “a research and experimental technology University,” which was the initial form of Yachay, but on a much smaller scale than the one the project would take eventually. While these universities were planned, the whole rest of the higher education system was under evaluation. In contrast to the other three Universities (a University for the Arts to be constructed in the city of Guayaquil, the National University for Education to be built in the city of Azogues, and a Regional Amazonian University to be built in the city of Tena), the location for this Research and Experimental Technology University was not determined. The creation of these four new universities rode in the waves of expectations tied to the generation of a new education system, based on the constitutional reforms, which would hypothetically allow Ecuador to make a historical jump. The country was also riding a wave of public resource availability based on several factors, among them: high international oil prices – and the associated reforms to the oil extraction contracts made by the government; a fiscal reform which aimed to increase tax collection in a context historically marked by fiscal evasion which limited public resources and potential redistributive effects (Granda and Zambrano 2012; Jorratt 2011; Roca 2009); and the re-negotiation of the external debt.

When talking with some of the actors that were behind the creation of the 2010 LOES, I realized that the idea behind these universities emerged within ongoing intragovernmental debates and negotiations regarding what they conceived as the state of education and its relation to development at that time in Ecuador (Van Hoof et al. 2013). In a way, it illustrated how they represented the pasts that they had received from previous governments and what future lines of action they wanted to pursue as both solutions to those pasts and as a way of generating a new present, rapidly. It has to be noted that all of these

11“Fifteenth. – During the five years following the promulgation of this Law, no new institution of higher education will be created. The National University of Education ‘UNAE’ is excluded from this moratorium, foreseen in the Twentieth Transitory Provision of the Constitution, whose matrix will be in the city of Azogues, Province of Cañar; the Regional Amazon University, whose headquarters will be in the city of Tena, Napo Province; the University of the Arts with headquarters in the city of Guayaquil and an experimental technology research university” (Ecuador 2010).
movements were not debated only concerning their economic costs and expected results but also concerning what one of the interviewees, who worked in a high position of the government, called the “political capital cost” (Public Authority 3, personal communication, 2017). This was both the risk involved in taking decisions or generating dispositions which could mean losing political support in the short term, as well as potentially winning additional support in the future as a result of the success of these projects. This overall political capital was mainly measured, or made partially observable, through elections; hence, as mentioned in the introduction to this section, the dates of elections were one of the main temporal reference points around which many of the government’s plans were organized and visible results were expected.

Moreover, the idea supporting the creation of this “research and experimental Technology University” was to achieve a very short latency, understood as the time between an already occurred action or event and when its effects become visible in the present, between its creation and the University’s articulation to the international channels of academic collaboration and production. In other words, the triggering of the generative effects it was expected to have:

a university that could anchor to the world system immediately […] with all professors having a PhD, most of them with experiences in first world universities and all those academic dynamics. So, historically, the project evolves first with the ratification of the Organic Law of Higher Education and the exceptionality of creation of universities included in it, specifically the Research and Experimental Technology University, which is how it was called specifically in the law. (Public Authority 2, personal communication, 2017)

Here, Michelle Murphy’s work around latency becomes relevant. Latency is understood as the time between an already occurred action or event and its effects becoming visible in the present (Murphy 2013, 1). In this sense, expectations here were not only structured around the consecution of envisioned futures but also around the speed at which those futures could be achieved, and the speed at which the effects of reforms-decisions implemented in the recent past could trigger the emergence of those futures. Latency was expected to be reduced to a minimum. This resonates with ex-president Correa’s idea of creating Yachay, at the moment still conceptualized mainly as a university, which could almost immediately stand on its feet and run:

That was the central idea of Yachay: to be a University that from the first moment had international standards, the highest standards to choose a rector who had publications in journals indexed worldwide, authorities with a world-wide scope, a board of trustees with leading academicians, with candidates for the Nobel prize, etc. We wanted all teachers to have a PhD because it is easier to create something the right way from the beginning than to correct something that is already wrong. (Rafael Correa Delgado, personal communication, 2018)

The idea was to create a University that could both compete at an international level and be the flagship of a new Ecuadorian higher education system. Although the initiative implied taking high economic and political risks in a governmental landscape that had been historically volatile, and a context in which intra-governmentally the proposal was not totally welcome at first as the existing educational system would probably oppose it generating a political clash, the idea had the personal support and endorsement of the president who was willing to take risks in the creation of these universities. Importantly, the resources were available, and political gains could be equally significant.
4.2.3. The scaling up of Yachay

Simultaneously, this plan was presented to several public authorities and their respective advisors with the purpose of getting feedback and to socialize the plan. Particularly, they were asked for their perspectives on the government’s plan to build a high-level research-focused University. Among this consulted group of people was a public official who at that moment was working as an advisor in SENPLADES and had previous experience in Ecuador’s Ministry of Industry and Production. Interestingly, this person also had experience in a variety of private companies and had a robust academic training in universities of Ecuador and the USA. Hence, he was familiar with the work in the public and private sectors and understood the academic arena too. This SENPLADES advisor revised the proposal and was not satisfied with the scope and vision of the project. A crucial question was lacking regarding how such academic institution was relevant for the country at that moment in time, in his words: “I told them right away: this does not work” (Public Advisor 1, personal communication, 2016). In his perspective, creating an elite university in Ecuador would have no social impact because the country lacked a national system of innovation to transform the expected high-level research, that the envisioned university was set to produce, into significant industrial and commercial applications. In other words, there was no national innovation system in place to accompany the implementation of the proposed high-level academic research centre, therefore there was a risk of it becoming isolated. He had in mind a much more ambitious scope:

> It does not make sense to create a scientific and technological research university in Ecuador only for the sake of creating it, only as a university. If you did not develop at the same time the industrial sector, the business sector, academia, not as a university but academia at a global level, if you do not develop technological, technical institutes. It does not make sense if you do not generate dual training, it does not make sense if you do not have or develop a technology park, and it does not make sense if you do not support everything that constitutes the entrepreneurial movement and the innovation system. (Public Advisor 1, personal communication, 2016)

According to him, if this university was created as a single project, it could easily become an isolated island within an education system that was not research-oriented, with private companies that were not used to invest in research and innovation, and a public sphere with little experience in triggering innovative links with other actors. His comments were received with both surprise and interest: “you are crazy, just crazy, they said” (Public Advisor 1, personal communication, 2016).

The advisor was asked to incorporate his comments on a model that could be meaningful and relevant for the Ecuadorian context, and show in a brief model how this technical university should be reimagined. He got little time to do it before he had a strategic meeting with René Ramírez (at the time the director of SENPLADES and one of the people in the government closest to Rafael Correa, who had accumulated considerable power and influence). According to this advisor, he got to work immediately, as he saw in this assignment of re-imagining the project a unique opportunity because at that moment the government had the political and economic resources to invest in a more ambitious project than the original version presented to him. Additionally, this project resonated precisely

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12 This person has asked to remain anonymous. Nonetheless, the author has compared the informant’s testimony with public records and other informants’ rendition of the process.
with the kind of work he aspired to do. During our interviews, he described himself as “a man who wants to get things done in order to really contribute to change Ecuador.” What he developed was, in his words, a “tropicalized version” of a Triple Helix model, to which he incorporated two more helixes that were indispensable for him when thinking about Ecuador’s context: community and environment. He explained:

The development model in Ecuador has to be a pentagonal model where the state, the academia, the private sector are involved, but you must also involve the community and an environmental perspective! Without that development model, anything that is done won’t work. You have to understand the importance of involving and linking community factors, it is necessary to involve that process. (Public Advisor, personal communication, 2016)

In his model, the technical university with its campus was scaled up into a city, Ecuador’s first planned city in centuries, surrounded by all the elements he saw missing in the initial plan for the technical University; “you have to involve everything I mentioned, in other words, you have to create a city, a new city, Korea style. However, tropicalized to Ecuador, zhumirized to Ecuador. It has to be all zhumirized.”13 And what was initially imagined as a University that could run as soon as it got in its feet, was then reimagined within the scope of a generational change whose effects would not be seen in the close future and that depended on what he called a series of “saltos cortos” (small jumps) rather than fast-trackable transformations:

You cannot enter immediately to produce nanotechnology in a country in which we are not nanotechnologists, we do not have that habit, and we do not have that background. We have to start from what we have […] the change of the productive matrix is generational, it is not overnight, and it does not come with a project. It comes through generations; it is a process that lasts 20, 25, 40 years. It took Korea 30–40 years to change its primary export function to what they are today. It is a generational change, which basically comes from the conditions that you give to universities to enter research processes that take years of research processes applied to the development of your region and based on the realities of your region and your industrial sector. (Public Advisor 1, personal communication, 2016)

René Ramírez and other authorities in SENPLADES analyzed the brief proposal and were interested in the potential of the suggestions oriented towards a reconfiguration of the initial idea. A team was formed within SENPLADES to develop the new concept with this public advisor as the person in charge; he was hired as a consultant to develop the model for a “Zona Económica de Desarrollo del Conocimiento y Nuevas Tecnologías de Comunicación e Información para el Ecuador” (Economic Zone for the Development of Knowledge and New ICTs for Ecuador).14 Among other things, authorities saw in the new proposal a project that could connect the legal transformations triggered by the education reform to a broader impact in the economic structure of the country; an impact on the pursuit of what government authorities referred to as the “change of the productive matrix.” As the advisor mentioned, he saw this process as taking a much longer time-frame and developing incrementally rather than abruptly. However, there was tension from the start between the political rhythms and speed imagined and set by the government and the conceptual apparatus being developed for the

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13Zhumin is a brand of an Ecuadorian traditional high alcoholic spirit.
14The public advisor outlines his academic and professional experience in his curriculum vitae (Public advisor 1, personal communication, 2016) which I have compared with official records of both SENPLADES and SENESCYT and other informants’ accounts.
project. Government authorities wanted a more direct future, a reduced latency between present action and future effect, which could be made visible and presentable as material progress as soon as possible. The very word “change of productive matrix” implied a foundational relationship with social reality that could conceal the need to build on the base of what already existed. These different expectations from the project meant that from the beginning, the different actors, including the named public officials, were working within multiple time-frames. At the same time, they were working within the scope of a distant future planned for Yachay, but also dealing in the present with the maintenance and advance of their own short-term interests and political trajectories.

A small team, headed by the previously quoted public advisor, was organized to work on the reconfiguration of the initial plan of a “Research technical university” into a project which contained academic as well as public and private sector actors. The new scope of the project increased the required resources, risks and the space required for the implementation. A number of public officials went to Korea to receive training on science and technology parks, and during the early months of 2010 they presented the new concept to the president who was convinced with the expectations it represented. During April 2010, SENPLADES was declared officially in charge of the design of the project to advance its implementation. The team working in SENPLADES took inspiration from a variety of sources, some from personal trajectory such as the mentioned advisor’s experience who, for instance, found inspiration in Utah State University – where he had the opportunity to study – since he perceived that university as the core of the local development of the area. Furthermore, his training in industrial policy in Korea also inspired him. Hence, his reference to the Korean model was not only conceptual but experiential. In other words, his vision of Ecuador’s sociotechnical future was interlaced with his experience and understanding of various past trajectories, and more importantly, by the way he was able to mobilize both in the present. The initial idea of a technical university oriented to high-quality research was then transformed into a Ciudad Universitaria (University City), which was also referred to as a Ciudad tecnológica de investigación (Technological Research City). This Ciudad Universitaria contained in addition to the university an industrial park, a technological park and a zone for urbanistic development. The new model was presented to higher authorities and to the president during internal meetings, and it was supported by the president even when others had doubts. This support was translated into a presidential commitment in which SENPLADES was put in charge of finding an alliance with an international company or academic institution that would collaborate with them in the development of a plan for the implementation of the Ciudad Universitaria. (SENPLADES 2011b).

Expectations were at the driving front of these processes, i.e. representations of future states of knowledge and technological development that could bring together private, public, and academic actors as never before in the history of Ecuador. That is, expectations of a past finally surpassed by a future in which Ecuador could connect to the world system through means different from the historically dominant exportation of raw materials, and

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15Visualizations of the Ciudad Universitaria or Ciudad tecnológica de investigación can be seen presented by expresident Correa on 7 August 2010 during his weekly report Number 182.
establish a relation based on the production of knowledge-intensive technologies and scientific expertise.

One of the aspects highlighted during those early design reconstructions was the need to have international support and advice for the project, as the Ecuadorian academia and government had no previous experience developing a project of this scale. During the weekly report 182, Correa mentions that they are looking internationally for alliances in order to build a “tripartite alliance between the state, an academic institution from the first world that can provide us with researchers and academic standards, and one or several private companies” (Audiovisual 2010, 1:03:00). Then, the Korean case, not only as a particular city or project but more broadly as a historical exemplar of the development of a set of public policies and alliances between private and public actors, became more relevant. The Korean case was already present within discussions regarding public policy and science, technology, and innovation promotion internally in Ecuador’s government, given that it was perceived as an exemplary country that had rapidly advanced its economic structure through a process in which the government had been a protagonist. Moreover, the LOES was about to enter into debate in the National Assembly, and the idea of following a Korean inspired model was becoming influential in the government’s model of development in general.

During September 2010 Rafael Correa visited Korea and Japan in an official visit tour, that had been announced months in advance, in search for alliances, investment, and international cooperation in a variety of topics ranging from renewable energy to investment in the Refinería del Pacífico (an enormous oil refinery planned to be built in the coast of Ecuador). The team behind the reconceptualization of the project of Yachay managed to include in the president’s itinerary a visit to KAIST and Incheon which were, in their minds, materializations of the ideas they were developing for the Ciudad Universitaria.

During the trip to Korea, Correa visited several cities, including Songdo, and different industrial complexes, to negotiate cooperation between the two nations in a variety of topics, mainly around Korean energetic investment in Ecuador. With this experience, he became even more convinced that the Ciudad Universitaria was the kind of project his government needed: a project that combined both the educative transformation his government had promised and the “change in the productive matrix” which had become the guiding sociotechnical imaginary within the government.

During November 2010, official cooperation was established with Korean advisors from IFEZ (Incheon free economic Zone). Accordingly, a Memorandum of Agreement and Exchange of Experiences was signed between SENPLADES and the Special Economic Zone Authority of Incheon (IFEZA), to promote the design and implementation of a Special Economic Zone of Development of Bio-knowledge and Communication and Information Technologies, which would be called the City of Knowledge in Ecuador. During the next years, a Master Plan was developed between the advisor team from IFEZ and an academic institution from the first world.

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16Correa was invited far in advance to this visit, in fact, as early as Correa’s presidential possession day he received a formal invitation from the South Korean government for an official visit. This shows that interest in cooperation preceded Yachay (MOFAT 2009).

17See the reports: Tiempo (2010), E.B. (2010), El Universo (2010).

18IFEZ have used this cooperation as a platform on which to promote and generate their own expectations, see the note on their Journal on 2012: “The entire world is now paying attention to IFEZ’s successful development model” (IFEZ 2012, 6–7).
As a product of this closer interaction, the previous idea of a Ciudad Universitaria (University City) scaled into that of a Knowledge City, hence the name Yachay the city of knowledge. This change not only affected the name of the project but it also changed its scope and, with this, it augmented the amount of resources needed. The city of knowledge model was conceptualized to require at least 4000 ha, whereas the previous plan for the Ciudad Universitaria was, as mentioned before, 200–300 ha. The urban aspect of the project was strongly highlighted with the Korean influence, specially the line of urbanism related to knowledge cities and knowledge-based urban planning, which can be traced back to the 1990s and across a variety of regions in the world ranging from Australia to Rumania, but that is nowadays more associated with Asian urbanism and knowledge-economies (Elena 2015; Yigitcanlar, Metaxiotis, and Carrillo 2012; Yigitcanlar, Velibeyoglu, and Martinez-Fernandez 2008). Recently, this type of cooperation has been analyzed within the idea of “south-south cooperation,” the internationalization of Korean and Chinese sociopolitical influence and the circulation of Asian urban models across Latin America and Africa (Chavez and Gaybor 2018; Noorloos and Leung 2017; Yoo 2012). In this sense, the Korean cooperation inserted the project in a much more ambitious scheme, with numerous international dynamics at stake, with an ever more wide-ranging expected potential impact. In this model the University remained as a critical component, but there was an up-scaling of the dimension of the project beyond the university.

During this process, two teams were established to generate the model that Yachay would pursue, incorporating the recommendations and experience from IFEZ as well as the specific aspects that the Ecuadorian team from SENPLADES-SENESCYT21 were interested in pursuing, which would make, from their perspective, the project feasible and meaningful for the Ecuadorian context:

We proposed the following: we are not interested in you (in respect to the Korean team) coming and giving us the material only, we told them let’s create two teams, one of you in Korea, and one here in Ecuador. You are going to do the transfer of technology and knowledge to the Ecuadorian team, and we will tropicalize it as we go. We worked for months putting together the whole conceptual scheme and the development plan and planning for the next 25 years, with investment planning per year, how it had to be done, and planning the growth of the city by stages. We generated the whole concept together with frictions and all. (Public Advisor 1, personal communication, 2016)

The result of this cooperation is Yachay’s Master Plan, presented in its final version to the government in November 2013 (IFEZ-Ecuador 2013). It contains the long-term vision of the project for the next 35 years stating that it would be developed along a period that started in 2010 running at least until 2045. This time-frame is divided into four phases,

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19 On 17 November 2010, the Memorandum of Understanding and exchange of experiences between SENPLADES and the Special Economic Zone Authority of Incheon (IFEZA) is signed in Incheon, South Korea, to promote the implementation of the Special Economic Zone of Development of Bio-knowledge and Communication and Information Technologies, which is now called the City of Knowledge in Ecuador.

20 This can be observed in the Informe Ciudadano 182 (weekly reports in which the president and members of the cabinet informed, on national television, about their weekly activities).

21 On 5 December 2011, SENPLADES transferred the obligations, rights, attributions, functions, responsibilities, financial resources, information, and other documents of the City of Knowledge Project to SENESCYT. Along with this transfer, a number of public officials migrated from SENPLADES to SENESCYT, including René Ramírez and one of his advisors, Héctor Rodríguez, who would become increasingly involved in the development of the project and after occupying multiple charges in both SENPLADES and SENESCYT would eventually be named the general manager of Yachay EP in March 2013.
and Yachay is already in its first stage that runs until 2019 and has been named “the dynamization phase” (Yachay 2013b, 3). Comprised within this first phase are the following: the construction of Yachay Tech, the building of residences for at least 4500 students and 200 instructors, the edification of the first installations for the research clusters and all the infrastructure regarding essential services and mobility (Yachay 2010). The goal in this first phase was to build strong foundations for the project in order to allow successful future expansions by “providing the infrastructures and main construction of the industrial research centers, the University and the residential areas in order to meet basic needs” (Yachay 2013b, 4).

The principles of Yachay, as elaborated by the small team working in SENPLADES, explicitly embodied the principles of the National Plan for Buen Vivir (Senplades 2009). They pursued a model of innovation centred around not only private actors but heavily promoting the potential role of the state in these processes, assuming the limited initiative of private actors in Ecuador’s economy, especially in regards to investment in innovation, science and technology research. Among other principles, it embodied the idea of generating new economic poles for the country to move beyond centralization in Quito and Guayaquil; what technicians from SENPLADES called “Ecuador’s polycentric development.”

This representation of the contexts at stake and the lines for future action to be pursued, aligned with Correa’s representations of the past and future of the country under his political project. Correa saw Yachay as the kind of development that could transform Ecuador’s economic matrix, reconfigure the terms of its connection with the world system, and fit perfectly into what he read as the particular context of the Ecuadorian economy and the line of government he had pursued during his mandate. He explained:

Some also criticise Yachay saying we are statists “Why not like silicon valley?” They do not understand the specificity of Latin America. In Latin America, the private sector is very weak: it does not invest in research and development. In a country like Ecuador, the one that generates resources is the state, not because it is great, but because the oil is from the state. Then, another model is needed, not that of Silicon Valley. A model driven by the state, a public university, with facilities and incentives for the private sector to go to. From the Ecuadorian private sector, a project of the magnitude of Yachay was never going to emerge. (Rafael Correa Delgado, personal communication, 2018)

Furthermore, the model generated from the modification of the initial idea of the technical University would resonate at a personal level with the experience of ex-president Correa, who had studied part of his university life in Louvain-la-Neuve; there he met his wife, and after his presidency, it became his place of residence. During the development of the model for Yachay, Louvain-la-Neuve became one of the benchmarks for Yachay, especially in the design stage of the city model and the projected role of the University in it (Clave 2014). Importantly for this analysis, this past experience was brought into the present to influence the trajectory of the project towards places like Louvain-la-Neuve (planned and constructed from scratch during the late 1960’s in Belgium). For example, during Yachay’s design, several cities were visited worldwide, one of them being Louvain-la-Neuve. The personal experience of former President Correa allowed him to connect the expectations of a possible future for Ecuador that was presented to him in the New Model of Yachay with a city that already existed and that he knew well from personal experience. This connection between past and future strengthened the link between
Yachay and the government of Rafael Correa, it gave credibility to the expectations and thus made the project viable in terms of political legitimacy.

Once the president approved and supported the idea and the concept was turned into a project, the mobilization of expectations began for Yachay “the city of knowledge,” long before the Public Enterprise (Yachay EP) was even created. In the first tweets of the presidency about the project, Yachay was announced as being part of the second moment of the Revolución Ciudadana, and it was immediately linked to Rafael Correa’s administration. The first tweet I could trace goes back to December 2011.

“Yachay is the nation’s most important project. Let’s everyone support this project, which belongs to the second phase of the RC” (Revolución ciudadana – Citizen Revolution). President #Correa #Macas. (10 December 2011)

All of these were examples of how representations of the future of the project and of its impact on both the region in which it was going to be implemented and on Ecuador more generally, were continuously being interlaced with representations of the past. As highlighted by the literature, the use of expectations is aimed at attracting attention, resources, and commitments (Brown, Rip, and Van Lente 2003; Konrad 2006). This use of expectations was applied effectively within the government, which, at this point became the most significant funding source for the project.

On 13 March 2013, the Public Company Yachay Empresa Pública “Yachay EP,” was created by the Executive Decree 1457 published in the Official Record Nr. 922 28 March 2013. A symbol of the new public company was added to Yachay’s previous logo. With the creation of Yachay EP, the project gained autonomy from both SENPLADES and SENESCYT. It gained legal personhood to manage the ZEDE, forming its structure and obliged to generate necessary infrastructures in managerial and legal terms. It gained a large number of resources upon its creation. Yachay was incorporated both into the National Plan for Buen Vivir and in the national strategy for the change in the productive matrix; the guiding plans in Ecuador’s periodical planning system (SENPLADES 2013, 2014). This was a significant step in a continuous process of reconfiguration of the visions and ambitions embodied in the project, which overlapped with the legal and political
infrastructuring of Yachay across time. In this process, expectations worked as interfaces through which multiple actors connected, sometimes complementarily and other disruptively, and pasts and futures related to their trajectories and those of Ecuador’s contexts at stake. In the next section, this process is going to be exemplified through a different entry point connected to the implementation of the initial physical infrastructures in Yachay.

4.3. Entry point 2 implementation: repair for a different future

Yachay’s Master Plan states that the whole initiative would be developed between 2010 and 2045, distributing the time-span into four phases. The first stage would last until 2019 and would focus on building the university and the residences for around 4500 students and 200 teachers, establishing the long-term bases for the initial research clusters and importantly, implementing the necessary infrastructure for services and mobility (Yachay 2010). This initial stage would entail an investment of USD 1.041 million dollars (between 2012 and 2020). Having these elements in mind, the government had to take two decisions early on: where to establish the project and which sector should have the head start for the physical implementation of the planned city. The following paragraphs will describe how these two questions were answered and how these decisions affected the site where Yachay would be implemented and the people living in it.

Even when Yachay was promoted as a city built from scratch, as the “first planned city in the history of Ecuador” and the “new” components were highlighted regularly in the narrative, from the beginning of its implementation the actors involved had to deal with the reconfiguration of the existing conditions and trajectories both materially and symbolically. In this way, the expectations were also materialized in the process of building the infrastructure of the project by reconfiguring particular relationships to the past and future of the sites where Yachay was going to be built. One outstanding detail about Yachay at this point was its size: 4462 ha of land. These were expropriated by the government, starting in November 2011, from around 100 different owners. Large extensions of land were expropriated from big haciendas, but there were also other expropriations from small and medium-sized proprietors. Some spaces within this extension of land were repaired to generate new use for them; for instance, the buildings that would eventually become the University, as I will illustrate below. However, at the same time, many of the lands were sub-utilized generating breakdown and decay of the previous settings in place, mainly regarding agricultural production.

According to official sources, the government considered several places when deciding the appropriate location to implement the project. Some of them were closer to main cities such as Quito or Cuenca, and others situated in areas which had been often overlooked historically like Santo Domingo, the fourth most populous city in Ecuador located in a tropical area at the west of Quito, and Urcuquí, where it was finally built (Yachay 2012c, 7). According to government documents, during working meetings seven specific criteria were established to select the location. These were the availability of

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22This paper has focused on the paths that ended up in the creation of Yachay EP; the University’s (now called Yachay Tech) history interlocks with the present one, as discussed in this article, but also has its specific elements. Future articles could focus on that history.
land extensions with at least 2000 ha; slope: flat zones preferably; connectivity: accessibility 0–1.5 h to the international airport; closeness to populated centers: areas near a populated center of national importance; water: availability between 0 and 25 mm/year; vulnerability: zones with low seismic and volcanic vulnerability; climate: temperate, humidity less than 80% (Yachay 2012c). Urcuquí was selected among the different options as it fulfilled the proposed criteria and, according to government calculations, it would also have the lowest cost per hectare of land and would be situated in a space with historical significance. The government also mentioned indexes of land concentration and “socioeconomic vulnerability” as one of the crucial factors that tipped the balance towards Urcuquí. This was because the project was expected to benefit regions of the country which had been previously overlooked and relegated (SENPLADES 2011a). We must take in account that Ecuador’s main economic centers are located in Guayaquil (near the Pacific coast) and Quito (in the central Andes region); Yachay is located three and a half hours away from Quito and 13 hours from Guayaquil. Its location was intentionally chosen to allow its growth in the future into a different economic center for Ecuador (Yachay 2010).

The selection, expropriation and use of the lands to build the project also tapped into a long colonial history shaping land property and its agricultural production in the country. Land concentration and associated inequalities in access to land and other resources, such as irrigation water, along with the lack of technological transfer to small-scale farmers, have been structural problems since colonial times. Urcuquí was not the exception. After the selection had taken place, the government stated that:

The first planned city of the country will be built in Urcuquí, province of Imbabura, in an area of 4,270 hectares, an area of ideal climatic and topographic conditions for the operation of high level academic and scientific centres. (Yachay 2012c, 9)

This pursuit of the “perfect” place for the production of knowledge intersects with the insights generated by STS literature on the configuration of new knowledge spaces (Merz and Sormani 2016) and truth spots (Gieryn 2006; Gieryn 2002). The insights within this scholarship regarding the importance of place in the pursuit of credibility and the reconfiguration of materials, actors, and narratives in the production of new knowledge spaces can be read in the case of Yachay throughout the materialization of expectations in the configuration of its infrastructure. The present itself was already seen through the eyes of the expected project; Urcuquí was seen through the future eyes of Yachay. In promotional images, sociotechnical imaginaries of Yachay in the future were fused with views of the Valley of Urcuquí; thus, visualizing a land “committed” to the future, a future that through these visualizations inhabits the present in a ghostly manner. As Doreen Massey argues, this is one of the reasons why studying the past of a place is fundamental in order to understand the temporal struggles which are triggered by the disruptions generated by the implementations of this kind of projects. The author explains:

The description, definition and identification of a place is thus always inevitably an intervention not only into geography but also, at least implicitly, into the (re)telling of the historical

23An illustrated video summarizing these reasons can be seen in Ciudad Yachay (2014).
constitution of the present. It is another move in the continuing struggle over the delineation and characterisation of space–time. (Massey 1995, 190)

In the next paragraphs, two moments in which these elements intersected during the early implementation of Yachay will be analyzed, highlighting the importance of history and the actualization of pasts and futures during these processes.

4.3.1. Place, land, repair, and decay

Yachay was designed as a state-led top/down intervention focused on triggering generative linkages between private, communitarian, academic, and public actors and institutions. This approach meant that at least in the early stages, the government would be making all the decisions while being in charge of the principal investments through public funds. Consequently, it would also be dealing with most of the risk involved. Nonetheless, on the one hand, this centralization of the role of the government was intended to change across time as private investment was attracted, and civil organizations got more involved in the development of the city. On the other hand, although in theory the main actor was the government, from the beginning of the implementation process, other actors, such as the people living in the communities within the perimeter of intervention and people from Urcuquí, had to deal with the risks too.

Following the selection of Urcuquí as the site for the project, the government made a declaration of public utility in December 2011 for the 4462 ha, which consisted of 117 properties of very different sizes, which when in use were mainly dedicated to agriculture. Some of these properties had large extensions, some came from haciendas and some smaller ones from other owners. According to public records, 13 families owned 72% of the total area of intervention, while there were 48 properties with less than 20 ha. The biggest of all the properties was the Hacienda San José, at the time owned by the Salvador family, who had around 900 ha (Yachay 2011).

The expropriation process that followed the declaration of public utility was very problematic. Agreements were achieved between the government and some of the landowners, but there were also owners who refused to accept the payment and decided to sue the government. One of my informants who was involved in the expropriation process from an executive role would describe his experience during that time and the tensions generated, in the following way:

I was in charge of limiting the expropriation area, that is, establishing the limits for the implementation of the project and that was also done with advice from the Korean team and us, but we translated it into the field. I became the most unpopular character among the traditional agrarian world of the province of Imbabura. The hacendados said, “That's not what my land is worth.” So we entered a judicial process, which meant a substantial erosion in the implementation of the initiative. (Public Authority 4, personal communication, 2017).

Adding to the tensions, a vast amount of the expropriated lands was not planned to be used immediately. The project was expected to grow gradually over time but the expropriations were not done gradually. Public authorities decided to expropriate all the extension of the land from the beginning in order to avoid possible future speculation. As a result, a large amount of the land was not put to use, remaining inactive, waiting for the promised future to come. Unsurprisingly, for the land once used for agriculture, this
meant that significant extensions have started to degrade and suffer erosion; others, which were already not in use, remained neglected in the short term while the legal litigations were processed. In a way, that land was promised for a prosperous future, but the inactivity generated by this anticipation produced and reinforced processes of decay. I was able to witness this first hand during fieldwork.

The expropriation process also generated tension with the communities living in the zone. The area of Urcuquí and the haciendas that were expropriated by Yachay were marked by dynamics of control and struggle for land and water. This is an issue present around Ecuador and continues to be one of the sources of inequality nationwide. Currently, and after two agrarian reforms, Ecuador still has a very high index of inequality in the distribution of land (Larrea and Greene 2018; Macaroff 2018; Martínez 2014), the Urcuquí zone had a high centralization that can be followed historically to the colonial time with the distribution of the territories by the Spanish crown.

The entry of Yachay occurs in a moment of transition during the rupture or decay of what would be the hacienda form of production in the central region of Ecuador (Bretón 2012; Feijoo 1991; Martínez 2014). For example, the Hacienda San José was sold during the 1970s to the Salvador family who let part of the existing infrastructure of the hacienda to fall into disrepair and eventually decay (see Figure 3). The communities in these territories had a historic struggle with the hacendados regarding land and irrigation water management (Apollin 2002; Apollin, Nunez, and Ruf 1998; Feijoo 1991). In fact, some of the interviewees mentioned that before the entry of Yachay, several groups in the communities were already organizing to buy land from the landowners collectively. This illustrates some of the other futures at stake for the inhabitants of those lands.

**Figure 3.** April 2012, an overlapping image of the ruined houses and the projected student residencies. (SENESCYT-Yachay Ciudad 2012, 21).
Yachay arrived fast, and when the decision was taken to expropriate at once all the territory that would be used in the future, a significant part of the more than 4000 ha would face a paradoxical situation: promised for a bright sociotechnical future but left to the hands of erosion. This decision resonated with both the national and local tendency in the history of Urcuquí and San José, towards the accumulation of land and its subsequent underutilization. The government planned to avoid speculation concerning the future prices of the land, as well as harder legal struggles, which is why they decided to buy all the required land immediately. Thus, Yachay had a promised land to a medium-term future, at least 30–40 years into the future, but whose process of expropriation was swift and carried out in a short period. This was so because they anticipated that the ongoing expectations would push up the prices of the land generating the temptation of owners to speculate or build sprawls outside of the Yachay intervention area. When asked about this topic, ex-president Correa described the following:

One of the errors that people criticise, which could have been an error, but a minor error, is that from the beginning, we expropriated almost 5000 hectares, knowing that it would take years to use them all. However, there was a risk that if we did not expropriate all, the space could have been urbanized. (Rafael Correa Delgado, personal communication, 2018)

This initial speed marked an intense break, both in generative and destructive ways, with the rhythms and ways of life of people in these areas, as well as with their expectations regarding their own lives and their children’s. The break generated with the existent socio-economic regimes, and the potential opportunities for the children in the projected city, signalled this change in expectations. For example, to protect their lands from public expropriation, several groups of families who were settled in small neighborhoods within the intervention site organized and legalized their properties as communities (La Hora 2012). This changed their legal status and reshaped their own organization internally, their sources of income would also have to be adapted similarly, and this was particularly difficult for many of them.

This moment of expropriation and, more importantly, what came after it with the construction of the physical infrastructure, illustrate the paradoxical nature of infrastructures (Howe et al. 2015) and their relationship with timescapes (Joniak-lüthi 2017). For example, the decisions taken in the present during this early stage of implementation shaped multiple relationships with the future. On the one hand, the repair of specific spaces like the heritage buildings, that were described as patrimonial, speaks of an active relationship with the past embodied in those buildings. But, on the other hand, it also marked a fractionated start with the communities that lived there in the present. Several of these communities organized and opposed to ceding their lands to the “public interest” and they organized themselves as communities legally so the government could not expropriate their lands. However, an effect of that legal movement was the linking of these communities to the future of Yachay, since they were within the perimeter of intervention and would be then part of the ongoing development of the project into the future. Yachay’s administrators, anticipating a possible future, ended up repeating a past with which the Project was in principle aiming to break, i.e., a colonial past where some hacendados ruled by centralizing the land and hierarchically managing the public space.
4.4. Repair

Interestingly, the authorities of the project, who at the time were working still in SENESCYT decided that the San José Hacienda was going to undergo a process of reparation, restoration, and its spaces reconfigured in order to serve in the near future as a base for the public University, which would be constructed at the heart of Yachay. The San José Hacienda has a long history that is tied to the colonial history of the haciendas and the aristocratic power in the central region of Ecuador (Apollin 2002; Feijoo 1991). The process implicated the repair and restoration of 49 buildings, ranging from a sugar mill to small houses in which the hacienda workers used to live when the hacienda was operating; these were in a state of substantial deterioration and could be seen as a symbol of the low quality of life most of the workers were subjected to during centuries, as well as the state of decay of the hacienda regime itself (see Figure 4).

In the view of the authorities involved in this process, the restoration meant, on the one hand, a material actualization, through the repair of many buildings and home settings, that in many cases were in severe disrepair and others in thorough decay, as we can see in the pictures above. But also, on the other hand, it meant a reconfiguration of what that repaired space meant historically and for the future. A once privately owned and centralized land, a symbol of the economic and social system of the Hacienda, became the foundation for a public project that was expected to transform the economic matrix of the country (see e.g. Figure 5). From private-oriented manual labor to public-oriented intellectual work, a sign in itself of the promised future transformation. In words of one of the authorities in charge:

We started to repair and potentiate what you can see now, the sugar mill as the classrooms and laboratories of Yachay Tech, the House of the Hacienda as the administrative area of Yachay Tech, the stables and the dormitories of the workers, now converted into the dormitories of the students, and classrooms. So, we modified it symbolically too, that was very important because what was once a symbol of the aristocratic opulence of Ecuador in the past centuries, we turned into a project of a public university. (Senescyt authority 1, 2017)

Figure 4. The houses of the workers before and after the repair process. Source: INPC (2012); Yachay (2012b).
The process of repair and restoration was perceived as a breaking point for the social and economic dynamics coming to an end in Yachay, and, at the same time, the starting point of a new space reconfigured for public education, knowledge sharing, and innovation. This reconfiguration would be at the very heart of the city, marking a symbol of a repaired past as the center of a future assemblage. The past interlaced materially with the future, in this case, the repair of the existing infrastructure and the new function it would have, were established as symbols of that same past coming to an end, and a way of connecting Yachay as a technological innovation with the technological power and significance which the sugar mill and the complex (see Figure 6) as a whole had had in the past. San José Hacienda had been owned before by the Jijón family who sold it to the Salvador

Figure 5. (Upper) The “Casa de Hacienda” during San José, early twentieth century. Source: INPC (2015), 14–15 and (lower) the administrative offices of Yechay Tech after the reconfiguration process and already in use in 2015. Source: Yachay Tech (2017).
family. San José was “modernized” during the twentieth century by Jacinto Jijón y Caamaño by implementing a semi-industrial complex to process cane sugar in a process that authors have tied to the adaptation of the hacienda regime to a more capitalist-oriented mode of production (Bretón 2012; Feijoo 1991; Guerrero 1984). He was known as “El Conde Jijón y Caamaño” and he is a figure of a broad historical significance for the country. His family owned different properties in the region across centuries (Colmenares 1992), and they were a powerhouse in both political and economic spheres. Preserving the buildings was a way of acknowledging this power and reconfiguring it rather than erasing its traces:

We started with the old San José sugar mill and said, “this is going to be the axis of the territorial development of the future City of Knowledge.” And the installed infrastructure started from the fact that the Count Jijón y Caamaño built all of that complex and developed the infrastructure of the first sugar mill in the northern part of the country. (Senescyt authority 1, 2017)

The process entailed not only a rupture with the past but also a reallocation of the power associated with that infrastructure to a new set of actors and practices. Through these expectations, the government was building a potential future, which they had positioned as desirable. Moreover, through that interaction between futures and pasts, the government aimed to generate in the present a stabilized timescape, a horizon of meaningful actions that could be accepted collectively. Interestingly, the Korean advisor team initially did not agree with this line of action. In fact, they promoted a different one in which constructing new buildings from scratch would have been preferable to repairing old ones. Similarly, they proposed to design the University buildings as tall-concrete buildings and not based on the style or materials of the existing infrastructures:

Koreans did not have that concept. For example, there the Korean advice was mega buildings, as is Daejong, as is Seoul, as is Ing Xion. That is, they arrive and a 40-story tower, because also the logic of land use is restricted, then, they grow upwards, and the capacity of construction is impressive. However, we have a natural environment as wonderful as is the province of Imbabura and the same area of Urcuqui; we are not going to implement such features. So, we combined the logic of that look a bit and decided that we should also take advantage of the

Figure 6. The machinery and the chimney of the sugar mill during the early twentieth century (1920–1930) (INPC 2015).
infrastructure. Then, in no way, we were going to disappear them, but we recovered them. (Senescyt authority 2, 2017)

Thus, the authorities decided to maintain a symbol of the past both as a sign of its reconfiguration and as the way of announcing a transformed future. Nonetheless, such connection to the past also acquired a different meaning for the other actors affected by the project. For instance, some actors from the communities observed in the reconfiguration of the infrastructure of the hacienda, a similarity with previous hierarchical relations; they perceived a particular way of organizing the space that resonated with a past in which the space of the main house in the hacienda was heavily restricted for the workers (see Figure 7).

In words of one of the residents of Urcuquí:

Now in operation, this university stands on the reconstructed hacienda, the planners who intervened in it, kept the original architectural layout. It keeps the places where the workers, and previously slaves, received the orders, the same places where the employees lived, where they were punished, and also where mass was taught. Where once was the home of the boss and the foreman, you now find the rector’s office and the administrative offices, where the middle managers of the hacienda lived now live teachers. The place were the workers lived was called “the ranch,” the students live there now. Times changed, the architecture was rebuilt and is new, the disposition of the power spaces of the hacienda is maintained as if the hierarchical social system was still there. (Gil Eloy Alfaro Reyes, an Ecuadorian researcher of Urcuquí and the San José Hacienda, born in Urcuquí. (Alfaro-Reyes, 2017, p. II))

During the implementation of Yachay, several historical trajectories came into play and intersected one another. In fact, while these kinds of futuristic-oriented urban planning and socio-technical projects are often associated with, and reduced to, the model of

Figure 7. Different moments in the repair and maintenance process in the old Main House of the Hacienda which would later serve as the administrative offices for the university. This was a heavily restricted space during Hacienda times (Yachay-EP 2013).
Silicon Valley; the history of this type of projects extends into a deeper past. For example, it is part of the history of techno-cities in diverse regions of the world from the very early twentieth century (Kargon and Molella 2008); and science-cities such as Akademgorodok in the Soviet Union (Tatarchenko 2016) and Tsukuba in Japan (Anttiroiko 2005; Dearing 1995). These reflect an ongoing centuries-old negotiation,24 around the multiple objectives, social roles, power relations, and modes of interaction of the sciences and their collaboration/disconnection with other social spheres such as the state, the collective

Figure 8. (Upper) Workers of the Hacienda in the main plaza of Hacienda San José during Hacienda times. Source: Tech (2017); and (lower) the plaza and administrative offices after the repair now used as a section of Yachay Tech (Tech 2017).

24See for example “The City of the Sun” by Tommaso Campanella in 1623 (Renna 1999), Sir Francis Bacon’s “The New Atlantis” in 1624, and “Christianopolis” by Johann V. Andreae in 1619 (Bierman 1963). Consequently, “the organization of scientific work and its place in the social order have been under negotiation and construction for centuries, and there is every reason to expect this to continue” (Hackett et al. 2017, 734).
organization of life in cities, the business sector, and the civil sphere (Dierig, Lachmund, and Mendelsohn 2010; Hackett et al. 2017). Hence, Yachay should also be read against the long history of ongoing negotiations in Ecuador between educational institutions, the state, political organizations and the sciences. Negotiations that Yachay both shapes and is shaped by.

Throughout this infrastructuring moment, Yachay was generating-dealing with both repair-maintenance and breakdown-decay on different settings by establishing specific and contingent ways of representing-mobilizing pasts and futures through expectations materially and symbolically (see Figure 8). Expectations, as it has been argued in this article, are an essential part of the ecologies shaping the creation and reconfiguration of infrastructures. If we accept that expectations are an essential part of these processes, then the tools that have allowed us to sustain and improve the use of infrastructures across time, such as maintenance and repair, could also be applied to our approach to expectations themselves. Analyzing the interaction of different pasts and futures in the processes of infrastructuring across time in projects such as Yachay is crucial to understand how different trajectories, expectations and stories are negotiated, mobilized, ignored or repeated during the material configuration of the projects. I argue that this type of analysis illustrates more comprehensive pictures of the dynamics shaping these projects across time by trying to avoid narratives in which only the role of the state, presumed as a monolithic structure inserted in a given historical or political trajectory, is taken into consideration. Thus obscuring the role and agency of multiple actors within and outside public institutions, and the interconnected multiple trajectories at stake.

5. Conclusions

This paper analyzed two different moments in the trajectory of Yachay the city of knowledge. The analysis illustrated how expectations were used in the two different entry points to mobilize futures and pasts that would end up shaping the concept, scale, and ambition of the project. The literature on expectations was combined with the literature on infrastructures to provide a more systematic understanding of the dynamics involved in the emergence, implementation, and reconfiguration of the project. One of the goals of this paper has been to complement the current understanding of expectations’ orientation to the future with an understanding of the role of the different pasts at stake. Expectations, it has been argued, also have an orientation to the past, and they are always embedded in different histories.

The case of Yachay, as discussed throughout this paper, shows that futures should be studied hand in hand with the histories involved in the contexts where they emerge, the trajectories of the people who construct them and the ways pasts are represented-actualized in the present. Futures are part of broader temporal horizons or temporal landscapes that are also composed of pasts and emerging presents, which can be mobilized strategically. On the one hand, the evidence from Yachay highlights the complex temporal dynamics involved in infrastructural projects, especially in cases in which futures are explicitly political, and the state plays a prominent role. On the other hand, the focus on expectations, as one of the critical elements involved in the processes of generating infrastructures from their initial design into moments of maintenance–repair or
breakdown-decay, presents a different model of analysis of Yachay that challenges the success/failure readings of the project.

If expectations can be understood as a fundamental component of infrastructuring practices, then expectations, and not only infrastructures, may also require maintenance and readjustment in the face of breakdown or decay. Dealing with the constant tension and the gap between initial expectations and performance, is a growing challenge for sociotechnical projects and emerging scientific fields (Galanos 2018; Schyfter and Calvert 2015; Van Lente, Spitters, and Peine 2013), and Yachay is not the exception. Some crucial challenges to consider in such complex projects to navigate them more robustly are: acknowledging uncertainty and the risk involved for a variety of actors; developing coherent relations of accountability and developing practices that take into account the gap between expectations and performance – all these while remaining open and adaptable to the dynamic forces of breakdown/repair.

Contrariwise, the centralization of decision-making obscures the collective risk and overlooks the irreducible uncertainty of this kind of projects. Even worse, this may end up turning expectations against the projects themselves. This is especially true in the current international setting in which the investment and need for future investment on infrastructures have reached an all-time high globally. But, the risk of building infrastructures that are not sociotechnically resilient in the midst of a swiftly changing world has grown equivalently (Thacker et al. 2019). With this in mind, understanding the role of expectations as interfaces through which pasts and futures are mobilized and actualized in the present, may prove a key component in understanding technological change and the dynamics of infrastructuring across multiple settings.

Further research and theorization need to be done to fully incorporate the insights from the literature on expectations with the productive scholarship on infrastructures. Both are marked by their temporal approaches and could benefit from their interaction, as it has been explored here. Moreover, they can find in other systematic approaches to temporal phenomena such as temporal studies (Bastian 2013; Birth 2012; Huebener 2015; Sharma 2014), fruitful discussions and debates to enrich their analysis. This is of particular interest in contexts like Ecuador that are marked by profound historical inequalities, and where it is not sensible, or academically sound, to ignore histories and local temporalities to focus only on novelty and futurity.

Similarly, the paper has tried to show how representing the process through which Yachay was generated as a simple importation or application of a foreign model (Chavez & Gaybor 2018; Fernández González, Cadenas, and Purcell 2018) neglects a series of constant reconfigurations rooted in specific actors’ trajectories and contingent negotiations, which have been crucial in the history of the project. Instead, focusing on expectations can address the constant work required to sustain specific representations of pasts and futures, in the form of narratives, future-objects, infrastructures, and relations. Far from being a simple export of a Korean economic model, the history of Yachay shows a constant readjustment of the project according to the changing contexts, political times and the actors involved in the project. Looking at the project through a longitudinal scope, such as the one proposed by the BOAP approach used for this research (Hyysalo, Pollock, and Williams 2018; Pollock and Williams 2010a), allows us to understand the life of the project through the multiple reconfigurations it has gone through across different settings, and to understand the role of expectations in those different moments.
Furthermore, this approach helps us to avoid totalizations of data generated through a single-entry point as a sound source to generate judgements of the project as a whole. If we collapse the complexities involved in technological change into a deterministic narrative that portrays sociotechnical phenomena in a fixated state, be it of a victorious utopia or a disastrous dystopia, we can lose sight of the current and potential work of repair, care, reconfiguration, and maintenance (Graham and Thrift 2007; Haraway 2016; Rô Me Denis and Pontille 2015). Subsiding in this way into the foundational-oriented narrative of having to erase or dismiss everything in order to start all over again, which has fuelled the obsession with futurity and novelty. A more careful analysis of the situated practices, knowledges, expectations, and interactions over time, may allow us to generate openings for knowledgeable intervention and accountable interaction with the multiple stakeholders to improve the web of relations that compose the sociotechnical projects at stake.

This paper has focused on the initial phases of the project. This analysis needs to be complemented by the exploration of the subsequent stages of the project embedded in the national and international changing contexts. The space of one paper is not sufficient to encompass the scope of the research in which this article is based, but future works could address the later stages of the project including the dynamics of Yachay EP and Yachay Tech in operation from 2013 and 2014, respectively, and the elements coming into play with the change of Government in 2017 onwards, to complement a more integral understanding of Yachay.

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