THESIS

Yachay, City of Knowledge:
An Analysis of Planning, Politics and Citizen Involvement

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Executive Summary

Knowledge-based (Urban) Development (KBUD) is considered a favored urban trend at the dawn of the new millennium. Francisco Javier Carrillo (2006, p. xi) noted that “few aspects of today’s world may characterize better the dawn of the new millennium than the transformation of regions and cities into knowledge societies.” The 21st century society is post-industrial and the knowledge society is its horizon (Choay, 1965). This horizon involves two emerging conditions: cities/urban growth and the raise of the knowledge economy.

Charles Landry (2000, p. xiii) identified the 21st century as the century of cities. Nowadays, the world’s urban population “is overcoming the 50% mark and is expected to become 75% by 2025” (Carrillo 2006, p. xii) - a percentage already reached by most Latin American countries. Then, this rapid urban growth indicates that this is indeed the century of cities.

Taichi Sakaiya (1991, pp. xvii, 58) and Peter Drucker (1994, pp.3, 6-9) identified the 21st century as the century of knowledge, where an increasing number of countries have been moving from material-based to knowledge-based economies “as the grounds for the foundation of the knowledge society” (Carrillo 2006, p. xi), its socio-cultural transformation, socio-spatial configuration, territorial development and economic growth. Therefore, we have already entered the century of knowledge.

Consequently, it is of relevant importance to analyze “the convergence of these two emerging conditions of human civilization at the dawn of the millennium: The Century of Knowledge Cities” (Carrillo 2006, p. xii) as a result of Knowledge-based (Urban) Development. This research analyzes the development of Yachay Knowledge City’s project – the first post-colonial planned city in Ecuador (Urcuquí Canton) – which is being developed under the government’s Good Living agenda and seeks to reduce territorial disparities and socio-spatial segregation among the country’s cities, promote equal access to goods and services and diversify the country’s economy, becoming the first knowledge hub of Latin America.

This research provides both theoretical and practical approaches on Yachay Knowledge City’s project. First, under the theoretical approach, it aims to examine the relationship between the planning instruments, the political discourses of public officials and the citizen perspective involvement regarding
Yachay’s project at the national, regional and local planning levels in its implementation, monitoring and evaluation stages. Second, under the practical approach, it aims to explore the relationship between Yachay’s project and its territorial/urban risks and community resilience challenges. Both the theoretical and practical approaches provide comparative analyses between planning instruments, political discourses, citizens’ perspectives and relevant case studies.

This research is valuable to planners because although the interest on Knowledge-based Urban Development is growing rapidly in the field, it still lacks broad and robust conceptual and methodological frameworks to address it. “There is neither a coherent conceptual framework nor methodology for the design, implementation, monitoring and evaluation of successful knowledge cities. Then, the real success of knowledge cities is still under investigation in the research community worldwide” (Carrillo 2006, p. 3). Therefore, this research aims at contributing to this investigation with its focus on an ambitious knowledge city project in the Latin American region.

1 Introduction

Currently, “knowledge management is considered one of the most valuable assets of an enterprise, which has to be managed efficiently and effectively in order to gain a competitive advantage in the knowledge economy era” (Carrillo, 2006, p. 3). However, “knowledge management has evolved into a strategic management approach, finding application not only in the business world, but also in other areas such as education, government, and healthcare. The fact that major international organizations – United Nations, the European Union, and the World Bank, among others – have adopted knowledge management frameworks in their strategic directions regarding global development, clearly indicates that a new link exists between knowledge management and knowledge-based development” (Carrillo, 2006, p. 3).

Francisco Javier Carrillo (2006), Professor of Knowledge Management at the Monterrey Institute of Technology in México, who has extensively written on knowledge-based development, argues that knowledge-based development and world’s urban transformation mark the start of a new era. The world today is also depicted by the transformation of regions and cities into knowledge societies. The increasing urbanization of the world’s population and, most importantly, the renovation of urban lifestyle in the post-industrial era is only the starting point of the 21st century society. “The new society is post-industrial; the knowledge society is its horizon” (Carrillo 2006, p. xi).
The 21st century is considered the century of cities (Landry 2000, p. xiii). Since the Industrial Revolution, rural-urban migration – still an ongoing process – has contributed to the world’s rapid urban growth. In 1980s, “total urban population worldwide was less than 30%. Nowadays, the world’s urban population is overcoming the 50% mark and is expected to become 75% by 2025” (Carrillo 2006, p. xi) – a percentage already reached by most Latin American countries. This rapid urban growth indicates that this is indeed the century of cities.

The 21st century is also considered the century of knowledge (Sakaiya 1991 and Drucker 1994). After World War II, an increasing number of industrialized and non-industrialized countries have moved from material-based to knowledge-based economies – over 50% of their GDP – “as the grounds for the foundation of the knowledge society” (Carrillo 2006, p. xii), their socio-spatial configuration, territorial development and economic growth. Therefore, we have already entered the century of knowledge.

This research study focuses on “the convergence of these two emerging circumstances: Knowledge Cities” (Carrillo 2006, p.xii) as the result of Knowledge-based (Urban) Development. This thesis project aims to contribute to the analysis of the ongoing state-financed project: Yachay Knowledge City, which is considered the first post-industrial planned city in Ecuador that aims to reduce socio-spatial segregation, territorial disparities and diversify the country’s economy, which has been historically based on commodities: cocoa, banana and oil booms. These economic surges generated mass labor migration, concentration of economic wealth in urban areas, decrease in wealth in rural areas, and subsequently unequal urban development. Consequently, Ecuador seeks territorial equity and social justice by moving from a material-based to a knowledge-based economy for national development through the investment in human capacity and the creation of Yachay Knowledge City.

This research provides both theoretical and practical approaches on Yachay Knowledge City’s project. First, under the theoretical approach, it aims to examine the relationship between the planning instruments, the political discourses of public officials and the citizen perspective involvement regarding Yachay’s project at the national, regional and local planning levels in its implementation, monitoring and evaluation stages. Second, under the practical approach, it aims to explore the relationship between Yachay’s project and its territorial/urban risks and community resilience challenges. Both the theoretical and practical approaches provide comparative analyses between planning instruments, political discourses, citizens’ perspectives and relevant case studies.
Under the theoretical approach, 3 planning instruments – national, regional and local plans – were examined, 5 public officials were interviewed and 70 local residents were surveyed. The planning instruments provided a theoretical framework and the interviews and surveys provided qualitative and quantitative data. This information allowed to evaluate the following hypotheses: (H1) Yachay’s project is (theoretically) aligned to the Ecuadorian government’s planning instruments at the national, regional and local levels involved with the Yachay project’s implementation, monitoring and evaluation stages; (H2) however, the theory of the planning instruments and the political discourses of government officials involved with the Yachay project’s implementation, monitoring and evaluation stages at different planning levels are not aligned; and (H3) the Yachay project’s impacts on the socio-spatial, territorial and economic aspects of Urcuí do not reflect the Ecuadorian government’s objectives.

Under the practical approach, more than 7 documents – literature review about knowledge-based urban development, knowledge cities and new growth poles – were examined, and 6 knowledge cities and 2 new growth poles case studies were analyzed and compared with Yachay. The literature review provided both historical and theoretical backgrounds on the topic; and the case studies provided practical background, qualitative data and geospatial references. This information allowed to evaluate the following hypotheses: (H4) Yachay’s project is (theoretically) a new growth pole rather than a knowledge city; (H5) it is territorial inefficient; and (H6) it leads to urban informality and native population displacement.

This research is valuable to planners because although the interest on knowledge-based urban development is growing rapidly in the field, it still lacks broad and robust conceptual and methodological frameworks to address it. “There is neither a coherent conceptual framework nor methodology for the design, implementation, monitoring and evaluation of successful knowledge cities. Then, the real success of knowledge cities is still under investigation in the research community worldwide” (Carrillo, 2006, p. 3). Therefore, this research aims at contributing to this investigation with its focus on an ambitious knowledge city project in the Latin American region.

2 Background

Historically, socio-spatial segregation, territorial disparities and unequal access to services have become recurring planning challenges in the Latin America region. In fact, according to UN (2013), Latin America remains the world’s most unequal region. This inequity has been intensified by economic booms
and recessions, which have widened the existing social gap within the region’s countries. Moreover, these economic events have both benefited and compromised Latin American cities’ urban development, which has resulted in the unequal provision of and access to services within them.

In Ecuador, for instance, socio-spatial segregation, territorial disparities and unequal access to services were exacerbated by the country’s different economic booms along its history; mainly the cocoa (1880-1929), banana (1950’s-1970’s) and oil (1972- late 1980’s) booms. These economic eras were based on an extraction-and-export model of primary products and nonrenewable resources. These primary products and nonrenewable resources were produced or extracted in different regions across the country. For example, cocoa and banana were mainly produced in the Coastal region (Bolívar, Guayas, Los Ríos and Manabi provinces), while oil was mainly extracted from the Amazon region (Morona Santiago and Pastaza provinces). These economic booms have generated significant national revenues through history, which are clearly visible. Currently, oil exports represent 57% of the country’s total exports and 51% of the national GDP. Consequently, it has been considered the most important export product (INEC, 2010). These economic booms have not only generated significant national revenues, but have also produced regional transfer of people from rural to urban areas, basically for employment reasons.

This rural-urban migration has taken place primarily where the primary export products and nonrenewable resources have been either produced or extracted. It has caused positive and negative economic impacts on the territory, generating concentration of economic wealth in some urban areas and decrease in wealth in rural areas. This unequal redistribution of wealth has also promoted unequal urban development within the national territory. As a result, a few cities have developed more than others, improving their infrastructure and connectivity networks (sanitation, healthcare, education and technological infrastructures, as well as road networks), while other cities have been left behind. As a result, goods, services and political power were concentrated in certain cities and scarce in others. For example, the Ecuadorian’s economic booms, its rural-urban migration and the unequal redistribution of wealth have produced significant economic impacts, generated concentration of economic wealth, promoted urban development, improved the infrastructure and connectivity networks and generated concentration of goods, services and political power in Guayaquil (Ecuador’s economic capital and main port), Quito (Ecuador’s capital, political power cluster and main financial node) and Cuenca (Ecuador’s cultural capital and an important tourist node), becoming “the most important cities”, out of a total of 216 human settlements in the country. Guayaquil (Coastal region), Quito and Cuenca (Andean region) have been significantly benefited.
from these economic booms while other cities across the country have been neglected, fragmenting the social fabric and intensifying the territorial disparities within the country.

However, two recent facts support the social and territorial recovery of the country from the challenging issues that have historically hit the Latin American region during the last century. These two recent facts are the Ecuador’s Legal and Constitutional Frame, and its Political and Economic Management Model.

Ecuador’s legal and constitutional frame – approved by the National Constituent Assembly in 2008 – and the National Plans for Good Living (PNBV) 2009-2013 and 2013-2017 – proposed by the National Secretariat of Planning and Development (SENPLADES) – support the national productive matrix’s diversification, a move towards social inclusion and an equal territorial development that favors historically neglected territories. For these purposes, the legal and constitutional frame guarantees essential Ecuadorians’ rights – including education, healthcare and housing, among others – and establishes equity and social inclusion as fundamental conditions for well-being. In other words, these legal and planning instruments support the restructuring of an equally-and-socially balanced state and its urban development recovery.

Ensuring compliance with these legal and planning instruments required a new political and economic management model, which focuses on using its oil wealth both to provide education, among other services, and to diversify the country’s economy away from an extraction and export model (Lockwood, 2013). In this effort, since 2007, the Ecuadorian’s government has embarked on an ambitious national educational plan, which aims to restructure the educational system. The educational system restructuring involves – among other things – a new educational offer and programs, as well as the unification of the scholar curricula for primary and secondary education; the evaluation and certification of public and private higher-education institutions and the closing down of those which do not meet the minimum excellence standards; full scholarship programs for higher education locally and abroad and the creation of a state-of-the-art city of knowledge (Yachay) and three public universities (Uniar, Unae and Ikiam).
The city of knowledge and the three universities are located in different cities, provinces and regions across the country, aiming to promote territorial equity and free access to education. Uniartes is located in Guayaquil, Guayas Province – Coastal Region; Yachay and Unae are located in Urcuquí, Imababura Province and Azogues, Cañar Province, respectively – Andean Region; and Ikiam is located in Tena, Napo Province – Amazon Region. They focus on adding value to primary export products and developing new technologies to diversify the country’s economy (Figure 1).

This research study focuses on analyzing the most iconic project: Yachay Knowledge City, the first post-colonial planned city in Ecuador (Figure 2).
Yachay - located in the province of Imbabura, Urcuquí Canton (just 15 miles from Ibarra, Imbabura Province and 75 miles north from Quito, Ecuador’s capital) - is being built since 2012 and is estimated to be completed by 2035 (Figure 3).
Currently, the project is in its 1st stage of development (out of 4) (Figures 4 and 5).
It is expected to house 180,000 inhabitants by 2114 and it will occupy 4600 Ha. of a former Andean agricultural valley. (Figures 6 and 7).
The Yachay's project has involved private land acquisition -22 farms (7 big and 15 small)-, where 6 native communities used to live and work (Figure 8).
Yachay – to know or learn with wisdom in Quechua – is the first post-industrial planned city in Ecuador seeking to reduce territorial disparities and socio-spatial segregation among the country’s cities and diversify its economy, becoming the first knowledge hub of Latin America.

This project has involved 2 urban proposals. The first proposal was developed by the Korean firm Icheon FEZ. Its main characteristics were: insensitivity to the physical, social, and historical contexts; excessive scale; land use isolation; low-density development; and long-distance connections. In addition, it did not analyze ways to integrate the new city with its natural and built contexts. The second, proposal was developed by an International Think Tank (ITT) team of foreign experts. This new proposal was characterized by its mixed land use and gradual densification, high-density development and close physical relationships. However, it did not consider the surrounding settlements, but suggested the government to integrate the new city with its immediate context, both the natural and built environments. These proposals are shown in Figure 9.

Yachay is being developed under the government’s Good Living political concept. This concept derives from the notion of Well-Being, which “has existed among native societies throughout the world. Its essence is universal, and it has been a constant human aspiration throughout history” (PNBV 2013-2017, summarized version, p. 21). For example, Aristotle talked about well-being in his ethical and political theories. For him, the ultimate goal of human beings was happiness, which could only be achieved through the fulfillment of their development expectations, resulting in a sensation of well-being. Therefore, well-being relates happiness to friendship, love, political undertaking, the possibility of contemplation, of theorizing, and creating/innovating to meet people’s development expectations (PNBV 2013-2017).
However, all of these elements seem to have been forgotten in the prevailing notions of development. Currently, “development” tends to be measured through Gross Domestic Product (GDP) variations; industrialization levels and modernization processes. Meanwhile, underdevelopment is attributed to the backwardness of society. Thus, this notion of “market or production development” has become a synonym of “well-being”. Nevertheless, the Spanish translation of the term “well-being” – “bienestar: bien-estar” – deserves further examination. In contrast to the notion in English, the verb “to be” has two meanings in Spanish: “ser”, which is a more permanent and existential condition (e.g., to be human); and “estar”, a more transient, temporary condition (e.g. to be in Ecuador). The expression “bien-estar” or “well-being” omits the former holistic understanding of “being” (Ramírez 2008, p. 387). Then, the Ecuadorian government proposed a new approach to the concept by renaming it as Good Living, which conveys a more permanent sense of “human development” (PNBV 2013-2017).

The concept of “human development” supports the idea of development based on the full realization of human beings’ potential and good living rather than on market development or production levels. It emphasizes quality of life, human opportunities and capabilities that must be encouraged in order to cover different types of needs, such as livelihood, participation, freedom and identity, among others. Therefore, what must be measured are not GDP, industrialization levels and modernization processes, but the living standards of people through indicators related to the satisfaction of human needs. In addition to covering needs and expanding current human capabilities, this new approach proposes a moratorium of the word “development” and the incorporation of the concept of Good Living in Latin America (PNBV 2013-2017).

In Latin America – particularly in Ecuador – the concept of Good Living came from the Andean indigenous ancestral knowledge, epistemologies and cosmos-visions of life (PNBV 2013-2017). The Andean indigenous greatest contribution is the notion of “Sumak Kawsay” – life to the fullest in Quechua language. Living life to the fullest consists in achieving total harmony with the community and the cosmos. This ancestral cosmos-vision is conveyed through the following Quechuan saying:

“The universe is permanent; it has always existed and will always be here; it is born and dies in itself and only time can change it.” (PNBV 2013-2017).

Sumak Kawsay conveys this cosmos-vision. It is essentially collective. The concept for Good Living is not an individualistic notion, but resorts to the idea of an ecological “us” (human beings and nature).
Good Living or Sumak Kawsay concept offers alternatives to humankind’s current problems. It strengthens social cohesion, community values and encourages the active involvement of individuals and collectives in major decision-making processes in order to construct their own destiny and happiness (PNBV 2013-2017). This concept is the basis for the Ecuadorian government’s planning instruments. These instruments involve the National Plan for Good Living, which proposes a new National Territorial Strategy and a Zonal Agenda at a national scale; Development and Territorial Organization Plans for Provinces and Cantons, which organize territorial development and propose regional projects according to the National Plan; and Master Plans to execute the projects – at local scales – proposed in the Development and Territorial Organization Plans. These planning instruments at different territorial levels are supposed to be aligned to accomplish national objectives. Similarly, the discourses of public officials in charge of implementing these planning instruments at different territorial levels are supposed to be aligned for the attainment of national goals. Then, it is important to analyze the relationship between the planning instruments and between such instruments and the discourses of public officials involved with Yachay project’s inception, implementation and monitoring stages to determine the consistency between them to achieve national goals. Also, it is important to evaluate the attainment of such goals through citizen perception analysis on Yachay project’s impacts. These analyses constitute the theoretical approach. Finally, it is equally relevant to explore the relationship between Yachay project’s territorial/urban risks and community resilience challenges for the achievement of national objectives. This analysis constitutes the practical approach. The methodology for these analyses are provided in the next section.

3 Methodology

3.1 Theoretical approach

This approach comprises three types of analyses: Instrumental, Discursive and Socio-economic/physical. First, it examines the relationship between the existing Ecuadorian Government’s planning instruments at different territorial levels – national, regional and local plans – involved in the Yachay project’s implementation, monitoring and evaluation stages. Second, it explores the relationship between the theory of such planning instruments and the political discourses of government officials involved at different territorial planning levels with the Yachay project’s implementation, monitoring and evaluation stages. Finally, it analyzes the relationship between the Ecuadorian Government’s Good Living political
concept and the Yachay project’s impact on the socio-spatial, territorial and economic aspects of the
country for the attainment of such political concept.

For these purposes, the research design involves: (1) a comparative analysis between existing
planning instruments at different territorial levels to establish the relationship between them; (2) five
interviews with government officials in public planning agencies related with Yachay’s project (non-
randomized) and one interview with a private adviser directly involved with Yachay’s project (non-
randomized) to explore the relationship between the theory of the planning instruments analyzed before
and the political discourses of government officials and private adviser involved with Yachay's project.
Finally, it includes 70 Urcuquí residents’ surveys on economic and physical perception about the project
(randomized within the target population) to analyze the association between planning instruments’ aims,
political discourses and people’s perception on the socio-economic impact of the construction of what it has
been built until January 2016 (because it is still under construction) of Yachay’s project. Then, research
participants included 5 public officials at government planning agencies in different territorial levels
(national, regional and local), 1 private adviser involved in Yachay’s project and 70 Urcuquí’s residents.

The government officials work at the main public planning agencies involved with Yachay’s project
and the private advisor was directly related to the project:

- 1 at SENPLADES (national level)
- 1 at GAD Urcuquí (regional level)
- 2 at Yachay EP (local level)
- 1 Private adviser (external consultant on Yachay’s project)

These participants are included in Figure 10 (except the private adviser).
Public officials and private adviser were asked (in advance via email) to take part of this study because they work/ed at SENPLADES/ GAD Urcuqui/Yachay EP and the researcher would like official information from these public agencies about Yachay’s project.

I visited SENPLADES/ GAD Urcuqui/Yachay EP offices to hold a 20-to-30-minute interviews with each of them to talk about Yachay project. During these interviews, I asked them to answer some questions regarding the planning instruments –relevant to the institution they work at– that are involved in Yachay project.

In addition, I asked the public officials to allow me to audiotape (voice recording), videotape (movie) and photograph (picture) them as part of the research study (photos with public officials and local residents surveyed attached in Appendix section). Finally, public officials were surveyed to collect their perceptions on the project’s socio-economic impact in Urcuqui.

Moreover, this approach evaluated Urcuqui residents' perception about Yachay project’s socio-economic impact on Urcuqui based on an anonymous survey. I asked local residents to complete 1 anonymous survey. No personal information (name, address, telephone number, etc.) was required from them. The survey focused on their socio-economic perception. This survey lasted no more than 2 minutes. There were 70 legal-aged people surveyed. As the survey asked for socio-economic perception, the target population was the Economically Active Population (EAP) from the 6 native communities located within
Yachay project’s area since they could provide information on this matter and the research study required information from people in this group.

These surveys comprised eighteen (18) questions. Among them, five on demographic, 12 on socio-economic perception and 1 optional (additional comment). Eight (8) out of twelve (12) questions on socio-economic perception had multiple-choice answers, 1 is a yes/no question and the rest open questions. The eight (8) questions on socio-economic perception with multiple-choice answers presented an ascending numerical scale from 1 to 5, being one (1) the lowest and five (5) the highest level of satisfaction, importance and/or probability (Likert scale). These surveys allowed analyzing the government officials’ discourses in relation to Urcuquí residents’ perception about Yachay’s project. Contrasting the results of formal interviews and anonymous surveys allowed determining the relationship between the public officials and Urcuquí residents’ perceptions on the project’s implementation and socio-economic impact.

Then, the research methodology applied for the theoretical approach presented both qualitative and quantitative data. Qualitative data allowed to understand the participants’ perspective (discourse) and perception (feelings) on the technical implementation and socio-economic impact of Yachay Knowledge City’s project in Urcuquí-Ecuador. Quantitative data allowed to numerically measure the participants’ perceptions.

Finally, a draft of the anonymous survey conducted to the native communities’ residents is attached in the Appendix section.

3.2 Practical approach

Under the practical approach, more than 7 documents – literature review about knowledge-based urban development, knowledge cities and new growth poles – were examined, and 6 knowledge cities and 2 new growth poles case studies were analyzed and compared with Yachay. The literature review provided both historical and theoretical backgrounds on the topic; and the case studies provided practical background, qualitative data and geospatial references. This information allowed to evaluate the following hypotheses: (H4) Yachay’s project is (theoretically) a new growth pole rather than a knowledge city; (H5) it is territorial inefficient; and (H6) it leads to urban informality and native population displacement.
In order to analyze the previous hypotheses, this approach comprises two types of analyses: Theoretical and Visual Comparative Analyses. First, the theoretical comparative analysis aims at (1) defining the key terms: knowledge-based urban development, knowledge cities and growth poles; (2) identifying their main features; and (3) comparing them with those of Yachay's project. Second, the visual comparative analysis seeks to complement the theoretical analysis by comparing geo-referenced maps, images and 3D mass models to show the similarities and differences between Yachay and the analyzed case studies, both knowledge cities and growth poles.

The knowledge cities analyzed were: Barcelona, Spain; Stockholm, Sweden; Munich, Germany; Montreal, Canada; Dublin, Ireland; and Delft, Netherlands. They were compared to Yachay based on their features at their development and operation stages. Similarly, the new growth poles analyzed were: Brasilia, Brazil and Ciudad Guayana, Venezuela. They were compared to Yachay based on their features at their development and implementation stages. Both analyses include geo-referenced maps, images and 3D mass models to show the similarities and differences between Yachay and the analyzed case studies. (Figure 11).

Figure 11. World Map: Knowledge Cities and New Growth Poles’ location
Based on the research methodology previously described, the study presented an exploratory, descriptive and comparative approach (theoretical and practical). It explores a relatively new and little discussed topic: Yachay “Knowledge City” in Ecuador. It also describes and compares properties, characteristics, and trends in both knowledge cities and new growth poles, with emphasis on Yachay.

4 Analysis and Findings

4.1 Theoretical Approach

Under the theoretical approach, 3 planning instruments – national, regional and local plans – were examined, 5 public officials were interviewed and 70 local residents were surveyed. The planning instruments provided a theoretical framework and the interviews and surveys provided qualitative and quantitative data. This information allowed to evaluate the following hypotheses: (H1) Yachay’s project is (theoretically) aligned to the Ecuadorian government’s planning instruments at the national, regional and local levels involved with the Yachay project’s implementation, monitoring and evaluation stages; (H2) however, the theory of the planning instruments and the political discourses of government officials involved with the Yachay project's implementation, monitoring and evaluation stages at different planning levels are not aligned; and (H3) the Yachay project’s impacts on the socio-spatial, territorial and economic aspects of Urcuquí do not reflect the Ecuadorian government’s objectives.

In order to analyze the previous hypotheses, this approach comprises three types of analyses: Instrumental, Discursive and Socio-economic. First, it aims at examining the relationship between the Ecuadorian Government’s planning instruments at the national, regional and local levels involved with the Yachay project's implementation, monitoring and evaluation stages. Second, it seeks to explore the relationship between the theory of such planning instruments and the political discourses of government officials involved with the Yachay project's implementation, monitoring and evaluation stages at different planning levels. Finally, it aims at analyzing the relationship between the Ecuadorian Government’s Buen Vivir (Good Living) concept and the Yachay project's impact on the socio-spatial, territorial and economic aspects of Urcuquí for the attainment of such aspiration. The discursive and socio economic analyses are presented as a whole (contrasting).
4.1.1 Instrumental Analysis

The planning instruments involved in this analysis – at different territorial levels – are shown in Table 1.

<table>
<thead>
<tr>
<th>Levels</th>
<th>Instruments</th>
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<tr>
<td>National</td>
<td>National Plan for Good Living</td>
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<td>National</td>
<td>National Territory Strategy</td>
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<tr>
<td>National</td>
<td>Zonal Agenda (Zonal Agenda 1)</td>
</tr>
<tr>
<td>Regional</td>
<td>Development and Territorial Organization Plan for Imbabura Province (2011-2021)</td>
</tr>
<tr>
<td>Local</td>
<td>Yachay's Master Plan</td>
</tr>
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These planning instruments and planning levels depict the national planning framework shown in Figure 12.
The National Plan for Good Living comprises 12 objectives for the attainment of Good Living standards such as territorial balance, economic development and social equity, among other (PNBV 2013-2017). The eleventh objective 11 synthesizes Yachay’s challenge for helping and supporting the country’s technological development and economy’s diversification. It says, “To ensure the sovereignty and efficiency of the strategic sectors for industrial and technological transformation” (PNBV 2013-2017). To meet this goal, Yachay must become the main research and technological development pole in the country to transform its productive matrix, strengthening the concepts of conservation and sustainable use of biodiversity under Good Living standards (Yachay’s Master Plan, 2015).

Achieving Good Living standards involves a new National Territorial Strategy (NTS). The NTS is proposed by the National Plan for Good Living. The NTS envisions the national territory as a dynamic poly-centric/multi-nodal social structure. It allows upholding consistency with national public policy by focusing on each territory’s strengths and potentialities (mainland, marine and islands) to develop territorial guidelines for multi-scalar planning. The territorial guidelines are established in the Zonal Agenda, articulating public actions in the national, regional and local levels through an investment and execution
plan for medium- and long terms, attempting to regain territorial equity, economic development and social justice to achieve Good Living standards (PNBV 2013-2017).

The Zonal Agenda – also proposed in the National Plan for Good Living – organizes the national territory into 9 planning zones. Each planning zone comprises several provinces. Yachay Knowledge City is located in Imbabura Province, corresponding to Planning Zone 1, Ecuadorian northern region (PNBV 2013-2017). The territorial guidelines for planning zone 1 support the Provincial Plan, which aims to transform Imbabura into the new development pole of the country promoting territorial balance, economic development and social equity. In this context, according to Yachay’s Master Plan (2015), Yachay is one of the main strategic projects at the national level. It is located in a region of special natural features and created by the need to initiate a rational and sustainable harnessing process of the natural and biological resources of the country through research and development of bio-knowledge, considering the Planning Zone 1’s territorial guidelines to create a new dynamic axis. These guidelines are included in the Imbabura Province’s Plan.

The provincial plan – The Development and Territorial Organization Plan for Imbabura Province 2011 – 2021 (PDyOT Imbabura 2011-2021) – is the regional planning instrument. It is based on the poly-centric structure defined by the National Plan for Good Living. Its mission is to transform Imbabura into the articulation node of the northern region, generating opportunities for domestic and foreign investments based on participatory planning. It envisions Imbabura “as the new development pole of the country; a province committed to protecting the environment, preserving its landscape, multiethnic and multicultural wealth” (PDyOT Imbabura 2011-2021). The mission and vision are essential elements that conceptualize the orientation of provincial development in the medium and long term according to its objectives, which seek “to structure the social, economic and basic services networks in the territory to facilitate the efficient operation and sustained development of new ventures” (PDyOT Imbabura 2011-2021). According to Yachay’s Master Plan (2015), the insertion of Yachay in the regional and national contexts is meant to conform a new dynamic axis, which will enhance and consolidate the guidelines and strategies at the provincial level generating a multiplier effect on other complementary economic areas.

Finally, at a local planning level, Yachay project’s main objective is “to create a city dedicated to academic and research activities, development of information technology and communication, biotechnology and related businesses, based on a technology platform and a sustainable urban
development. Specifically, (1) it aims to identify national development objectives to increase competitiveness and balanced the national territory’s development, (2) grant basic function of growth for the country’s economic development and (3) propose a model of Good Living-oriented city development for the next generations” (Yachay’s Master Plan, 2015, Cap. 1 p.4-5).

The planning instruments previously analyzed seem to be discursively aligned. However, there is a missing planning instrument at the local level: The Development and Territorial Organization Plan for Urcuquí Canton (2014-2019). The Urcuquí’s plan is still under development. This is why it is not considered in the Yachay’s Master Plan. This was confirmed by public officials interviewed at the local level. These public officials mentioned that Urcuquí Municipality (GAD) and Yachay EP are collaborating (i.e. providing information and coordination) along with the private consultant in charge of developing the Urcuquí Canton’s Plan to make it consistent with Yachay’s project. The lack of this planning instrument at the local level generates a gap in the planning framework. This gap produces a disconnection between the province and city planning levels because there is no planning instrument to articulate/coordinate actions at the cantonal level (Figures 13 and 14).
In addition, the public officials expanded the national planning framework by adding two instruments and one territorial level. First, the Constitution at the national level, which states that the National Plan is mandatory for the public sector and indicative/illustrative for other sectors. Second, the parish plan (PDyOT parishes) at the parish level. This plan is not considered in Yachay’s Master Plan either, generating a new gap in the expanded national planning framework (Figure 15).
As a result, it is unclear how the Yachay’s Master Plan connects to the canton and parish planning levels. What is clear is that all the existing planning instruments aim to territorial equity, economic development and social justice. Then, how do public officials understand these elements with regard to Yachay’s project?

4.1.2 Discursive and Socioeconomic Analysis

4.1.2.1 Public officials v. Citizens versions of events (interviews + comments)

For them, territorial equity -at the national level- means balancing the national territory and -at the local level- providing equal access to goods and services. They understand economic development as the generation of jobs. Finally, they recognize social justice as the citizen involvement in the decision-making process.
Regarding the territorial equity element - at the national level - they consider Yachay as a new development pole to balance the national territory northward. Regarding access to goods and services - at the local level - they mentioned access to public education, urban and housing upgrading projects and upcoming drinking water project, among others.

Regarding the economic development element - at the local level - they explained that 22 farms (7 big – 15 small) were expropriated, where a high number of native people worked under labor informality, with very low access to social security and employment benefits, earning around $8.00 per day (less than minimum wage). This “old” labor model deprived people from access to social and labor benefits. Consequently, they aimed to generate new jobs for these people and provide them social security and employment benefits (Figure 16).

For that purpose, they calculated the estimated number of workers based on the total population of the 6 communities located within the project’s area. According to public officials, the total communities’ population was approximately 1,300 inhabitants. The Economic Active Population (EAP) was nearly 65%. Then, the potential number of workers was around 845. To provide jobs for them, 7 associations were created for services delivery (i.e. feeding, cleaning, laundries, gardening, tourism and agricultural services),
comprising 124 workers (58 men and 66 women); Yachay EP directly hired 350 people and 3850 jobs opportunities were generated by construction contractors (Figure 17).

It is worth mentioning that the associations’ establishment involved citizen participation to define services to be delivered and training process (i.e. training in customer/tourist service and food handling) provided by public and private agencies to build capabilities for service delivery since most of the people had no other skills than agricultural. However, not all the people got engaged in this training process, which affected their further insertion in the new economic dynamic of Urcuqui.

The associations comprise 124 workers (58 men and 66 women). They are formed from 12 people minimum. They need a social capital of $1200 ($100 per person) for equipment and supplies purchase, which provides competitiveness among bidders in public biddings; and they must have one specific economic activity to avoid competitions among associations (Figure 18).
People registered in the associations are predominantly (56%) from the six communities within the project area (San Antonio, La Merced, Armastola, San Vicente, El Puente, Tapiapamba); 27% is from Urcuquí City; 15% from the surrounding communities and the rest (2%) from Ibarra (Table 2 and Figure 19).

Table 2. Associations’ Members by Location

<table>
<thead>
<tr>
<th>Communities</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>La Merced</td>
<td>35</td>
<td>28%</td>
</tr>
<tr>
<td>Urcuquí City</td>
<td>34</td>
<td>27%</td>
</tr>
<tr>
<td>Armastola</td>
<td>13</td>
<td>10%</td>
</tr>
<tr>
<td>Santa Rosa</td>
<td>8</td>
<td>6%</td>
</tr>
<tr>
<td>Tapiapamba</td>
<td>7</td>
<td>6%</td>
</tr>
<tr>
<td>San Vicente</td>
<td>6</td>
<td>5%</td>
</tr>
<tr>
<td>San Juan</td>
<td>6</td>
<td>5%</td>
</tr>
<tr>
<td>El Puente</td>
<td>5</td>
<td>4%</td>
</tr>
<tr>
<td>9 de Febrero</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>San Antonio</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Ibarra</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>124</td>
<td>100%</td>
</tr>
</tbody>
</table>
As a result, 98% of the people is from Urcuquí Canton, but not all of them worked at the expropriated farms. Around 30% of the people who lived and worked in the farms are now working in the associations. And only 80% of the partners is active because some of the registered people are not working with the associations (Figure 20).

But what do people say about these numbers?
Public officials argued that the associations reported USD$ 605,000.00 in sales by early 2015. All the associations’ members received a minimum wage [$366], social security and employment benefits. The major customers have been Yachay Tech (University) and some contractors of Yachay EP. These revenues have allowed to cover basic staffing costs and reinvest in equipment acquisition for services delivery. For example, a cleaning association has invested USD$ 5,000.00 in purchasing vacuum cleaners, hydro-wash machines and cleaning cars.

According to public officials, the involvement of these groups into the knowledge city project has revitalized the local economy, either because people receive a fixed salary every month or profits generated by the businesses implemented within the intervention area. Additionally, it has promoted gender equity. Associations have been a suitable labor response for women whose labor force was not predominant in farms, but now they represent 53% of the associated workers, allowing to boost their households’ economy. These enterprises/undertakings/endeavors have been an opportunity to involve women in local economic system. This proves that the “new” labor model does not only guarantee access to social security and employment benefits for people, but also promotes gender equity.

Although social security provision and wages have improved since Yachay’s project started, jobs became seasonal, not permanent as they used to be with the farms, according to local dwellers. Now, jobs are sporadic [1-year max.] and only for associations’ members. As a response to this, the government has implemented several initiatives and programs for providing jobs’ opportunities, but there have been no concrete results. Then, jobs recovery has not been adequately supported, according to people. Additionally, associations’ establishment does not consider people’s budget. They claim that most people do not have USD$100.00 to register in the association and buy the required equipment and supplies. However, non-reimbursable funds have been granted by Yachay EP (small amounts) and international donors ($80K - Belgian Development Agency) for equipment and supplies purchase. In spite of that, people still have to access credits through loans cooperatives. There are no public loans for this end.

From the 350 people directly hired by Yachay EP, 60% is from the 6 communities within the project’s area, 30% from Urcuqui city and surrounding communities, the rest from outside Urcuqui canton, according to local public officials (Figure 21).
In addition, construction has generated 7000 jobs opportunities the last 2 years. 55% [3850] has benefited local residents and former farmers, according to local public officials. However, construction operations stopped in October 2015 and are expected to resume in June 2016.

Finally, public official mentioned that Urcuquí’s residents have priority in the access to new jobs opportunities. However, priority has not been given to Urcuquí’s residents and outsiders have taken the jobs opportunities, according to local residents. Local residents claimed that they have been mostly excluded from new job opportunities.

This comparison and contrast of the official and citizens’ versions of Yachay’s project reflects different perspectives. After this comparison and contrast analysis, the surveys’ results are analyzed to clarify and expand the understanding of this scenario.

4.1.2.2 Citizens’ versions of events (surveys)

The results of the 70 anonymous surveys conducted during the fieldwork serve as a revealing/shark contrast to the "overoptimistic" rhetoric employed by most of the public officials interviewed. The surveys comprise demographic, economic, and social components. The demographic components involve Gender, Age, Education and Living time in Urcuquí. The economic components involve Economic
Activity (before/after project’s implementation) and Economic Impact perception. Finally, the social components involve Citizen Involvement (implementation period, method, regularity and type); Improvement in basic services provision, quality of life and disturbance perceptions; and Expropriation Process perception (economic compensation and physical relocation). The survey’s results are described and analyzed below.

Regarding the demographic component, among the 30 women and 40 men surveyed, more than 80% (58) are between 25 and 54 years old; more than three-quarters (53) have elementary education and almost all the respondents (69 people, representing 98.57%) have lived in Urcuquí for more than 15 years (Figure 22).

Before Yachay project’s implementation, 84% used to work in agriculture and livestock, 4% in commerce and tourism and 12% in other activities. After the project started, 44% works in other activity, 27% works in agriculture and livestock, but outside Yachay’s area, six (9%) work in commerce and tourism and fourteen (20%) are unemployed. Most of the people who used to work in the expropriated farms are unemployed or have had to find a new job by their own. This shows an important shift in the economic activity of the surveyed people and suggest people displacement due to increasing unemployment rates (Table 3 and Chart 1).
<table>
<thead>
<tr>
<th>Economic Activity</th>
<th>Past</th>
<th>%</th>
<th>Present</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture &amp; Livestock</td>
<td>59</td>
<td>84%</td>
<td>19</td>
<td>27%</td>
</tr>
<tr>
<td>Commerce &amp; Tourism</td>
<td>3</td>
<td>4%</td>
<td>6</td>
<td>9%</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>12%</td>
<td>31</td>
<td>44%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0</td>
<td>0%</td>
<td>14</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100%</td>
<td>70</td>
<td>100%</td>
</tr>
</tbody>
</table>

As a result, 61 people identified the economic impact of the project as low or very low. Most of the respondents complained about increasing unemployment rates. They argued that outsiders take the job opportunities. Consequently, they demand for more job opportunities, but priority should be given to local residents. Additionally, sixty-three respondents (90%) scored the improvement in basic services as very low. According to most of the respondents, improvements in basic services provision in Urcuquí have been either irrelevant or nonexistent since the project started. However, a state-financed project to supply drinking water to the area is being built, but it has stopped 2-3 months ago (Sep – Oct 2015).

Forty-nine people (83%) considered that the project has produced high levels of disturbance (i.e. crime, insecurity, drug dealing and environmental pollution) and fifty-eight (70%) scored the improvement in quality of life as low or very low since the project started (Figure 23).
Most respondents agreed that Yachay’s project might be a good opportunity to improve the quality of life of future generations, but it has not represented significant benefits for them until now. However, it is worth mentioning that the project is in its first stage of development and this perception can vary in time. The citizens’ perception on these factors were rated using a Likert scale, where 1 means "Very Low" and 5 means "Very High" (Table 4 and Chart 2).

<table>
<thead>
<tr>
<th>Factors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Impact</td>
<td>60</td>
<td>1</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Improvement in basic services provision</td>
<td>63</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Disturbance</td>
<td>1</td>
<td>5</td>
<td>15</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>Improvement in quality of life</td>
<td>39</td>
<td>19</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>
Regarding citizen involvement, 52 people (74%) agreed that there has been citizen participation. From them, 96% claimed that it took place during the land expropriation stage, claiming that it was out of time. This information was confirmed by the head of the planning department of the Municipality of Urcuqui, who mentioned that the national government selected the project's location before citizen involvement took place. Once the location was selected, the citizen involvement started. Then, the citizen involvement process became informative ("Yachay is going to be located in Urcuqui") rather than participative ("what do you think about locating Yachay in Urcuqui?"). From the 52 people who said that there has been citizen participation, 90% mentioned that there were meetings and assemblies to inform the people about the project. Additionally, 67% of the respondents said that these meetings and assemblies were rarely/occasionally performed. Most of the respondents agreed that the regularity of meetings and assemblies progressively decreased as time went on. People have asked the government for more frequent socialization; however, this has not occurred (Figure 24).
Also, from the 52 people who said that there has been citizen involvement, 77% pointed out that there was passive involvement (low proactivity) during these meetings and assemblies and that only neighborhoods’ representatives participated actively (23 people out of 52, representing 23% of the affirmative respondents). This shows that the citizen involvement process has been informative rather than participative. Lastly, people claimed that citizen involvement process was not comprehensive because it did not consider most of the Urcuqui’s local residents, but only the farms’ workers (Figure 25).
Finally, regarding the expropriation process, 46 people (66%) think that the economic compensation for the expropriated land was unfair and most of the respondents (60 people, representing 86%) said that the relocation was either inappropriate or nonexistent. Most of them said that the expropriation process generated dissent among landowners, which resulted in a series of trials and attorneys. Additionally, they claimed that the expropriation process has haltered agricultural production in the biggest 7-8 expropriated farms and that there were no prior studies for expropriation. This has resulted in abandoned/underproductive land (Figure 26).

In this aspect, public officials confirmed that there was not relocation because citizens wanted to be resettled not relocated. They considered they had that right because they are native people. Regarding the economic compensation for the expropriated land, public officials mentioned that the state payed the cadastral value for the land in accordance with the law. What happened is that the land was undervalued by the owner to evade taxation. Then the cadastral value did not reflect the actual productivity of the land. In spite of this, the state negotiated with the landowners and in most of the cases, both parties came to an agreement. Finally, regarding the abandoned/underproductive land, the government is implementing an agricultural land lease project, which is directed to members of the agricultural associations to work the land. The rental value is USD$ 90.00 monthly/Ha. However, local residents claim that each harvest takes place every 4 months.
In conclusion, the public officials’ discourses and Urcuquí local residents’ perspective on Yachay’s projects do not fully match. Actions taken by the government officials for the attainment of national goals do not meet citizens’ expectation mainly because of the lack of convenient, efficient and effective communication channels between them.

4.2 Practical Approach

Under the practical approach, more than 7 documents – literature review about knowledge-based urban development, knowledge cities and new growth poles – were examined, and 6 knowledge cities and 2 new growth poles case studies were analyzed and compared with Yachay. The literature review provided both historical and theoretical backgrounds on the topic; and the case studies provided practical background, qualitative data and geospatial references. This information allowed to evaluate the following hypotheses: (H4) Yachay’s project is (theoretically) a new growth pole rather than a knowledge city; (H5) it is territorial inefficient; and (H6) it leads to urban informality and native population displacement.

In order to analyze the previous hypotheses, this approach comprises two types of analyses: Theoretical and Visual Comparative Analyses. First, the theoretical comparative analysis aims at (1) defining the key terms: knowledge-based urban development, knowledge cities and growth poles; (2) identifying their main features; and (3) comparing them with those of Yachay’s project. Second, the visual comparative analysis seeks to complement the theoretical analysis by comparing geo-referenced maps, images and 3D mass models to show the similarities and differences between Yachay and the analyzed case studies, both knowledge cities and growth poles. As the theoretical and visual comparative analyses are mutually complementary, they are presented as a whole.

4.2.1 Key terms

According to Carrillo (2006, p. xiii), “the concept of knowledge city is often reduced to a constituent element generally focused on regional GDP growth” (i.e. techno-poles and innovation clusters). “Yet, none of these concepts requires the idea of Knowledge Cities, since they all have existed independently and have evolved on their own accord. In consequence, no urban development project, however strategic, justifies the use of the knowledge city label if it aims primarily at economic development or can be described in terms of available techno economic development frameworks.” So, what is a knowledge city?
Carrillo (2006, p. 4) notes that “the concept of knowledge city is very broad and may refer to all aspects of the social, economic, and cultural life of a city.” Carrillo (2006, p. 20) refers to Edvinsson (1999) who defines Knowledge City as “a city that is purposefully designed to encourage the nurturing of knowledge.” Carrillo (2006, p. 20) also cites the Australian firm SGS’ Bulletin Urbecon (2002), which describes the term “Knowledge City” as a “shorthand for a regional economy driven by high value-added exports created through research, technology and brainpower.” Finally, Carrillo (2006, p. 20) quotes Michaud (2003) who claims that a “knowledge city is notable primarily for the wealth of its acquired knowledge, which essentially revolves around its learning institutions, research centers, businesses and creators.” According to Ergazakis et al. (2004b, p. 5-15),

[a] knowledge city is a city that aims at a knowledge-based development, by encouraging the continuous creation, sharing, evaluation, renewal and update of knowledge. This can be achieved through the continuous interaction between its citizens themselves and at the same time between them and other cities’ citizens. The citizens’ knowledge-sharing culture as well as the city’s appropriate design, IT networks and infrastructures support these interactions.

Finally, Carrillo (2004) defines a Knowledge City as a permanent settlement of relatively higher rank in which the citizenship undertakes a deliberate, systematic attempt to identify and develop its capital system in a balanced, sustainable manner. “There is neither a coherent conceptual framework nor methodology for the design, implementation, monitoring and evaluation of successful knowledge cities. Then, the real success of knowledge cities is still under investigation in the research community worldwide” (Carrillo, 2006, p. 3).

Paradoxically, according to Yachay’s Master Plan, the case studies analyzed to develop Yachay “Knowledge City” were not knowledge cities, but Free Economic Zones (FEZ) case studies. These case studies are more related to Industrial Parks rather than Knowledge Cities. Therefore, it is worth analyzing the main features of the knowledge cities and comparing them with those of Yachay in order to understand its conceptualization.

4.2.2 Knowledge Cities and Yachay

In order to do so, this research refers to the acknowledged book Knowledge Cities: Approaches, Experiences and Perspectives, edited by Francisco Carrillo (2006), which presents a comparison analysis
between six successful knowledge cities globally. These cities are: Barcelona, Spain; Stockholm, Sweden; Munich, Germany; Montreal, Canada; Dublin, Ireland; and Delft, Netherlands (Figures 27).
The study’s findings and observations are divided into two main categories: development and operation (it does not consider a monitoring and evaluating category). Both features are of crucial importance for the design, development and successful operation of knowledge cities.

Under the development category, eight key features are analyzed. These are: (1) political and societal will; (2) strategic vision and development plan; (3) financial support and strong investment; (4) setting-up agencies to promote the development of knowledge-based regions; (5) international, multi-ethnic character of the city; (6) Metropolitan website; (7) value creation of citizens; and (8) creation of urban innovation engines.

Regarding the political and societal will feature, all the cases examined showed “a sense of social urgency, a belief in the necessity for change” (Carrillo 2006, p. 11) to face and cope adverse situations (i.e. the decline of traditional industries in Dublin or the scarcity of local resources in Stockholm (Montréal 2003)). This societal will for change was translated into political will in all the cases observed. The Ecuadorian society has also shown a belief in the necessity for economic and political change and has given ample support to transform the national productive matrix from an extraction-based to a knowledge-based economic model, generating scientific knowledge in the society, adding value to primary products, improving the national economy and overall improving quality of life. This societal will has also been translated into political will through the public officials’ proposal for building Yachay as a “knowledge city” (Yachay EP, 2013).

In addition, a clear strategic vision and development plan compiled by all the stakeholders at different levels and sectors of the society responsible for the city’s future is crucial to set specific objectives, measures and actions focused on specific targets such as “the development of a quality system of higher education, quality citizens’ life, and advanced social services” (Carrillo 2006, p. 11). All the cases examined had this common features. In Ecuador, the government and IFEZ – Incheon Free Economic Zone, a Korean firm – developed the Yachay’s Master Plan. This Master Plan focuses on the development of five specific fields: Nano-Science, Renewable Resources, Petri-Chemistry, Life Science and ITC, which are deemed of crucial importance to the national economy, according to the government. These fields are the basis for Yachay Tech, the university proposed within the city – the keystone of the project. However, Yachay’s Master Plan has had a top-down approach, excluding key actors of the society (citizens) from being part of the creation of this planning instrument.
Previously ensured and appropriate financial support and strong investments are necessary for the implementation of strategic goals (Montréal, 2003). In all the cases examined, “the cities have obtained financial support from public and private resources, by applying various tax schemes and by attracting public funding at the national and international level through marketing actions” (Carrillo 2006, p. 11). However, in Yachay, the primary investor is the government and the investment is based on oil revenue, which is currently going down, compromising the project.

Furthermore, the setting-up of technology foundations, research centers/institutions and universities as agencies that promote the development of knowledge-based regions is essential for a knowledge city to succeed (Carrillo 2006, p. 11). According to Yachay’s Master Plan, the city will comprise research centers and industrial sector, which will be linked to Yachay Tech to harness the knowledge generated by it. However, this linkage is not clearly explained in the Master Plan.

Also, an international, multi-ethnic and diverse character of the city is necessary to succeed “because such an atmosphere stimulates cross-fertilization of ideas and practices and promotes faster flow of knowledge that supports the different backgrounds, views, cultures, and experiences of its citizens” (Carrillo 2006, p. 12). All the examined cities share these characteristics. Yachay’s Master Plan does not clearly explain how the project will involve indigenous communities and their ancestral knowledge to Yachay’s project, nor with the new inhabitants of the city.

Additionally, an integrated local government website, “which responds in an integrated way to citizens’ needs and expectations in their search for information and their desire to assimilate into different communities, is also very important” (Carrillo 2006, p. 12). It should be (1) “a single portal, instead of several sites for the various municipal bodies; (2) a modern, visually appealing site, responding to usability criteria; and (3) offer effective e-government services” (Carrillo 2006, p. 12). Some of the analyzed cities’ websites do not have these characteristics. However, according to their strategic plans, “they will proceed in their transformation toward this direction” (Carrillo 2006, p. 12). In this sense, Yachay City of Knowledge does not have an integrated website that offers all the services mentioned above. Information about Yachay can be found either on Yachay EP, Municipality of Urcuquí and Yachay Tech websites or Yachay’s Facebook profile; but it does not exist in an integrated website.
Equally indispensable is the creation of value to citizens through the construction of “microcosms of creativity,” “establishment of spaces for ongoing societal dialog, and building of comprehensive, high-quality websites and networks among knowledge cities” (Carrillo 2006, p. 12). All the cases examined share this common feature (Carrillo et al. 2011). Currently, the space for ongoing societal dialog in Yachay is Yachay Tech - the University -, which is already in operation. It becomes a mean of dissemination and sharing of knowledge generated in by the academia.

The creation of urban innovation engines is also significant. An urban innovation engine is a complex system that includes people, relationships, values, processes, tools, and technological, physical, and financial infrastructure, to trigger, generate, foster and catalyze innovation in the city (Dvir, 2003) (i.e. libraries, cafés, a stock exchange market, municipalities, universities and museums). “The analysis of the case studies indicates that, indeed, the creation of urban innovation engines was of major significance for their success” (Carrillo 2006, p. 12). Currently, Yachay city promotes the operation of the Center for Entrepreneurship Innopolis, which is an incubation center for ideas, projects, knowledge and talent. It involves prototype labs, coo-working environment and funding, among other features. Additionally, Yachay will comprise research centers and institutions, technological and physical infrastructure (labs), etc.; however, the relationship between these institutions and facilities are not clearly explained in the Master Plan, nor their relationship with people.

Finally, assurance of knowledge rights of citizens, in terms of accessibility (broadband networks), information (complete, up-to-date and transparent public accountability), education and training (permanent ICT training) and citizens’ participation rights is substantial (Viale, 2004). “In the case of Dublin and Delft, the strengthening of the accessibility and participation rights of their citizens is still one of their strategic goals.” (Carrillo 2006, p. 13) Yachay’s Master Plan envisions this feature as a connectivity aspect of the city. A fiber optic project has been developed and partially implemented to assure the accessibility to global information. However, public accountability through this system is still pending.

Under the operational category, there are three key features for the integral development of knowledge cities. These are: (1) low-cost, integrated and equal access to advanced communication networks; (2) research excellence; and (3) the existence of public libraries network.
“Low-cost, integrated and equal access to advanced communication networks and broadband services for all citizens are imperative since they sustain the nurturing of knowledge through connectivity” (Carrillo 2006, p. 13). Most of the cities examined share this common feature. As mentioned above, Yachay’s Master Plan does consider this feature, but its expansion to other services (transparent public accountability and citizen participation) is still pending.

Research excellence is indispensable “to create new knowledge principally, but not exclusively, in the areas of science and technology. It provides the platform for new knowledge-based goods and services generated by its research centers and learning institutions. In the cases examined, the cities’ efforts to become knowledge cities were always accompanied by systematic efforts to develop advanced research capabilities in different clusters” (Carrillo 2006, p. 13). For this purpose, Yachay Tech researchers, and professors have a PhD degree in the areas of Nano-Science, Renewable Resources, Petro Chemistry, Life Science and ITC. These professors and researchers come from the “best universities” around the world. However, it is unclear how these experts will be retained in Yachay and how the knowledge generated by them and their students will be linked with the industrial sector.

Finally, the existence of public libraries network is necessary “not only for archiving the intellectual achievements of past generations, but also for serving as a place of innovation, where knowledge may be created and exchanged, ideas may be generated through conversations, and innovation can occur” (Carrillo 2006, p. 13). This feature is not included into Yachay’s Master Plan. It mentions the existence of a knowledge zone in which Yachay Tech, research centers and institutions will be included but does not mention any public libraries network. All the features previously analyzed are summarized in Table 4.
Table 4. Common features among successful knowledge cities and Yachay (Adapted from Carrillo 2006, p. 10)

<table>
<thead>
<tr>
<th>Common Features</th>
<th>Barcelona</th>
<th>Stockholm</th>
<th>Munich</th>
<th>Montréal</th>
<th>Dublin</th>
<th>Delft</th>
<th>Yachay</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Development</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political and societal will for change [social and political pact]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Strategic vision and development plan [stakeholders’ involvement at different levels and sectors]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>□</td>
</tr>
<tr>
<td>Financial support and strong investment [public &amp; private]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>□</td>
</tr>
<tr>
<td>Setting-up of agencies to promote development of knowledge-based regions</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>□</td>
</tr>
<tr>
<td>International, multi-ethnic character of the city [faster and more comprehensive flow of knowledge]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>Metropolitan website [e-government services in a single portal]</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Value creation to citizens [mechanisms for social dialog strengthening]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>□</td>
</tr>
<tr>
<td>Creation of urban innovation engines [systems, processes, tools and infrastructure to foster innovation]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Knowledge society rights of citizens [up-to-date and transparent public accountability]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td><strong>Operation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low cost access to advance communication networks</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>□</td>
</tr>
<tr>
<td>Research excellence</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>Existence of public libraries’ network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
</tr>
</tbody>
</table>

● The case study fully supports the statement
○ The case study does not support the statement
This theoretical comparative analysis between six successful knowledge cities and Yachay is based on Javier Carrillo’s study. “The key findings were expressed as 12 preliminary conclusions for building successful knowledge cities. Most of these statements are of crucial importance for the design and development of a knowledge city, while others are of major significance for the successful operation of a knowledge city” (Carrillo 2006, p. 14)

These knowledge cities do not only share these important and significant features, but they also share physical characteristics. In order to identify these physical characteristics, I conducted a visual comparative analysis.

4.2.3 Visual Comparative Analysis

This analysis focused on the urban morphological pattern of the city. The images below show the locations of the knowledge cities at national, regional and city levels. The visual comparison analysis show that knowledge cities do not have an established urban morphological pattern and that they vary from one to the other (Figure 28 and 29).
Figure 28. Knowledge cities’ locations at different territorial levels
City maps source: http://www.redbubble.com/people/graphical-maps/collections/311541-citymaps

Figure 29. Knowledge cities’ locations at different territorial levels
City maps source: http://www.redbubble.com/people/graphical-maps/collections/311541-citymaps
But what is true is that all knowledge cities evolved from already established urban contexts and their landscapes show high density, suggest mixed land-use, walkability and pedestrian (Figures 30 & 31).

Figure 30. Knowledge cities’ landscapes and city maps
City maps source: http://www.redbubble.com/people/graphical-maps/collections/311541-citymaps

Figure 31. Knowledge cities’ landscapes and city maps
City maps source: http://www.redbubble.com/people/graphical-maps/collections/311541-citymaps
Despite the fact that most of the knowledge cities’ main features are not/ partially supported by the Yachay’s Master Plan, the most significant difference between the six case studies and Yachay is that all the knowledge cities’ examples evolved from already established cities, most of them considered ancient cities; while Yachay is a new city starting from scratch – envisioned as a new growth pole – that seeks to become a knowledge city. Then, in terms of further research, it would be interesting and useful to expand the comparison analysis by including a “knowledge city” at the same stage of development of Yachay (i.e. Masdar City in United Arab Emirates initiated in 2008).

However, although the six analyzed knowledge cities are located around the globe, none of them is located in Latin America. Then, the comparison analysis of these knowledge cities provide a global perspective of this phenomenon rather than a regional one. In order to include a regional perspective into the analysis, this research study makes a second comparative analysis between two relatively-new Latin American growth poles and Yachay. These are Brasilia in Brazil and Ciudad Guayana in Venezuela.

4.2.4 Latin American Growth Poles and Yachay

Brasilia and Ciudad Guayana are considered new growth poles – starting from scratch – in Latin America (Figure 32).
These case studies have been extensively analyzed by well-known researchers. Brasilia, for example, has been analyzed in detail by James Holston in his anthropological critique of Brasilia (1989). Paul Rabinow (1990) and José de Carvalho (1991) have reviewed Holston’s critique. Likewise, Ciudad Guayana has been analyzed in Lisa Peattie’s books “A View from The Barrio” (1968) and “Rethinking Ciudad Guayana” (1987). Clara Irazábal has also analyzed Ciudad Guayana in her article “A Planned City Comes of Age: Rethinking Ciudad Guayana Today” (2004). Therefore, to analyze these two Latin American case studies, this research refers to this literature to compare these cities with the project of Yachay. This comparison enables both the contextualization of Yachay’s project in terms of location (both regional and physical contexts) and the understanding of the circumstances in which it is being developed.

Both Yachay in Ecuador, Ciudad Guayana in Venezuela and Brasilia in Brazil are relatively new “growth poles” developed in Latin America since the second half of the 20th century. While Brasilia and Ciudad Guayana were conceived in the mid-1950s and founded in the 1960s, Yachay was proposed in 2010 and is under construction since 2012. Although these new “planned cities” have been projected in different times, they share similar historical-political and economic backgrounds and objectives; location features; foreign urban influences; and planning management models. The similarities between these new
“planned cities” are striking, and they deserve thorough examination in order to prevent replicating in

Yachay some of the negative results obtained in Ciudad Guayana and Brasilia.

Starting in 1946, Brazil experienced a real sense of political upheaval. This political scene involved 5 presidents in 10 years – out of which 3 took office in a brief period of 16 months– a presidential suicide in 1954 and several attempted military coups. Meanwhile, in the midst of this political and democratic crisis, the Brazilian economy underwent structural changes, turning it from an export-oriented agriculture to an industrial economy based on previous agricultural revenues (Holston, 1989). By, 1956, the newly elected progressive leaders announced a five-year plan for economic development and initiated large-scale development projects. Among these projects, they envisioned the creation of Brasilia, a new capital city in the hinterland. Brasilia embodied the national will to overcome chronic territorial and social problems through the exploitation of the country’s vast untapped interior. It stood as a symbol of the future growth of the nation, concentrating its political power (Holston, 1989). Specifically, it aimed at national integration and regional development by incorporating the country’s interior into the national economy, more homogeneously distributing the population within the national territory and developing a new equitable urban and social pattern (Holston, 1989). This in turn, would promote the national recovery of self-esteem through the “utopia” of a glorious, just and full-of-pride future (Rabinow 1989), becoming a flag of developmentalism for the rest of the country. Therefore, Brasilia’s “planners aimed to preclude unwanted characteristics of the rest of Brazilian cities” (Holston, 2001, Kindle location 32) by overturning existing models.

By 1959, Venezuela returned to democracy after a decade of dictatorship. Within this political transition – a climate still characterized by deep political instability and a fragile democracy – and under a petroleum-driven economy, the new left-of-center political leaders focused on technocratic planning to promote growth (Irazábal, 2004, p. 25). For this purpose, “they supported the creation of the Guayana regional development project and its focus, Ciudad Guayana” in 1961. “This project aimed to spur nationalism, unite the country, diversify the economy, balance growth, and serve as an international flag for the accomplishments of democracy” (Irazábal, 2004, p. 25). Explicitly, it was envisioned as an industrial growth pole – focused on iron industry – “to promote economic growth and decentralized development distant from the northern capital, Caracas, and its extended metropolitan region” (Irazábal, 2004, p. 25).
Likewise, since 1996, Ecuador was plunged into a deep political instability and a fragile democracy (8 presidents in 10 years and 3 coups). By 2006, a progressive, left-wing candidate won the presidential election and took office in 2007 (incumbent). During this new presidential term, both the Good Living’s political concept and technocratic planning have been implemented as tools to promote national growth. Implementing these tools involves the execution of mega projects across the country financed by its oil wealth. One of these mega projects is the construction of Yachay “Knowledge City”, the first post-colonial planned city in Ecuador, that is aimed to reduce both territorial unbalances and socio-spatial segregation, as well as diversifying the country’s productive matrix through the generation of scientific knowledge, becoming both the first “knowledge hub” in Latin America and an international reference of a city for "good living" (Yachay EP, 2013).

Then, the historical-political and economic backgrounds of Brasilia, Ciudad Guayana and Yachay suggest that this kind of projects emerged as the result of two common factors: shaking political scenarios and booms of economic wealth generated by nonrenewable resources. In addition to these common factors, the Brasilia, Ciudad Guayana and Yachay projects share similar ideological objectives: they propose to transform an unwanted present by means of a future imagined as radically different through the concentration of different kind of powers – such as political power in Brasilia, industrial-economic power in Ciudad Guayana or cognitive scientific power in Yachay. These facts show the similarities between the new “growth poles’’ historical-political and economic backgrounds and their objectives.

The cities also share similar location features. For example, Brasilia, a new capital city, was built – from scratch – at the geographical center of the Central Plateau of Brazil, in the state of Goiás. The Brazilian Central Plateau is mainly agricultural; but it also comprises cultivated grasses and natural pastures. The site was located almost 1000 kilometers from the coastline, at approximately 1200 meters above sea level; it presented mild temperature and a regular topography surrounded by a vast area of stunted scrub vegetation; and it was close to the man-made Lake Paranoá, which was built to increase water availability to the region. These civic-administrative (capital city), physical (central-interior location), hydrological (close to a lake) and meteorological (mild temperature) features would help to stimulate Brazil’s interior development, the redistribution of its population and the generation of a new urban and social pattern, according to the Brazilian government (Holston, 1989).
Similarly, Ciudad Guayana emerged in Venezuela’s interior; however, it was developed upon two existing towns – Puerto Ordaz and San Félix, comprising 50000 people approx. – at the confluence of the Orinoco and Caroni rivers, eastern Venezuela – Bolivar Province (Irazábal, 2014). The main economic activities in the site were mining (basic industries), import-export trade (port city) and energy production (hydroelectric power). However, fishing, agriculture and livestock were also economic activities performed by people in the site (Peattie, 1987). The site was at sea level; it was hot and dry and it was located 300 miles from the parts of the country already densely populated (Irazábal, 2004). The site's physical settings (strategic location and connectivity) and hydrological conditions (two rivers and hydroelectric power), as well as its plentiful natural resources (iron, bauxite and ore) and production services (import-export trade, transportation, and basic industries) were splendid features for the development of an industrial growth pole, according to the Venezuelan government.

Regarding Yachay, it is being built in the northern province of Imbabura, upon Urcuquí town. Urcuquí is an existing settlement comprising 5205 inhabitants. Its main economic activities are agriculture, livestock, forestry and fisheries; followed by wholesale and retail trades on food; textile manufacturing industry and construction. Urcuquí is one of the most fertile agricultural valleys of the country – established at 2270 m. above sea level – with open spaces and flat areas surrounded by hills and mountains. Urcuquí has seven climate levels, which generate a variety of environmental conditions, habitat diversity, types of vegetation and landscapes, standing out the presence of rivers, lagoons, cascades, mountains and thermal-water springs. Urcuquí’s physical (strategic location and connectivity to three main cities), hydrological (close to four rivers and a hydroelectric project), meteorological (mild temperature and humidity level) and geologic (low vulnerability, limited geologic flaws and little flood risk) features made it the most suitable site for this undertaking – according to the Ecuadorian government – because they facilitate Yachay’s productive, industrial and research processes. Additionally, Urcuquí’s flatland minimizes construction costs in earth-moving tasks and facilitates the installation of infrastructure (Maquilón, 2014).

In general, these development projects were not located in territories already densely populated. Although Ciudad Guayana and Yachay were located upon existing settlements (Ciudad Guayana upon Puerto Ordaz and San Félix; Yachay upon Urcuquí), they were conceived as though they were tabula rasa – like Brasilia– marginalizing or totally ignoring the activities of the people and organized institutions actually in the site (Peattie, 1987), such as the municipalities of San Félix and Urcuquí, respectively. In
addition, Brasilia, Ciudad Guayana and Yachay share similar physical, hydrological and meteorological features, which, from the governments’ perspectives, benefited the projects’ purposes (Figure 33).

In addition, Brasilia’s urban plan and modern buildings were largely the work of the Brazilian planner Lúcio Costa and architect Oscar Niemeyer, they conceived the new city under the concept of “modernist city”. This concept derives from the manifestos of the Congrès Internationaux d’Architecture Moderne (CIAM), guided by Le Corbusier, who proposed social transformation through architecture and planning by organizing the city’s functions into five mutually exclusive sectors (housing, work, recreation, traffic and administration), determining its internal order and the overall shape of the city (Holston 1989).

Moreover, Holston (1989) noticed that both Costa and Niemeyer are Le Corbusian progeny. They worked with Le Corbusier on the development of modern architecture in Brazil between 1936 and 1943. Then, Le Corbusier’s (and therefore CIAM’s) influence and legacy on Costa and Niemeyer was later evident in Brasilia’s urban plan and modern buildings. For its part, Ciudad Guayana’s urban development involved the active participation of North American consultants from the Joint Center for Urban Studies MIT.
and Harvard University (Peattie 1987), who envisioned the city under the concept of “growth pole.” This concept was born as a non-spatial notion of leading economic sectors, developed by the French economist Perroux (1955), which was rapidly combined with the growing interest in regional planning in the U.S. to become a spatial concept of concentrated capital and industrialization in underdeveloped places to promote regional development and national spatial equilibrium (Irazábal, 2004, p. 24).

Then, both Brasilia and Ciudad Guayana experienced international influences during their inception stages.

Likewise, Yachay's first urban planning and design proposal was developed by the Korean firm Icheon FEZ (IFEZ), which imagined the city under the concept of “free economic zone” (FEZ). This concept evolves from the Entrepot Trade Cities – primitive economic zones– created in the middle of the main routes of international trade (i.e., Gibraltar, Singapore and Hong Kong), which were then transformed into free trade zones offering tax exemption benefits for goods imports and exports, simplifying customs procedures. This idea in turn, developed Export-Processing Zones (EPZ) by strengthening production and manufacturing functions through industrialization processes. As a result of the continuous progress of the EPZ, Industrial Parks (IP) emerged. Subsequently, the growth and complexity of industrial functions produced the consolidation of Free Economic Zones (FEZ) as part of the new structures of international trade. This evolution enabled the emergence of the Asian NIC's (Newly Industrialized Countries) development model, characterized by land use isolation, low-density development and long-distance connections.

In addition, Yachay’s second proposal was developed by the International Think Tank (ITT) with worldwide academics, mainly from the U.S., who inserted smart growth concept and principles (transects, place-making and morphological codes) to improve IFEZ’s proposal, generating mixed land use and gradual densification, high-density development and short-distance connections. Then, Yachay has experienced international influences during its inception stage.

In general, the planning proposals for these new cities have been influenced by foreign tendencies, either from Europe, United States and/or Asia. These foreign tendencies aim primarily at both economic and industrial growth rather than knowledge development. In addition, the implemented planning
management models in these case studies were primarily led by the governments and generated controversial results. For example, Brasilia’s urban planning, construction and management were in charge of a state corporation, Novacap. Based in Rio de Janeiro, it developed Brasilia’s first Master Plan, which “organized the entire cityscape in terms of a new kind of spatial logic,” redefining “the key functions of urban life, namely work, residence, recreation, traffic and civic-administration (Holston, 2001, Kindle location 160). It directed this redefinition by promoting state planning and imposing a new type of urbanism to “dissolve any conflict between the imagined new society and the existing one” (Holston, 2001, Kindle location 153-170). This redefinition involved, among other things, the prohibition on “development of an urban periphery for the city’s poor” (Holston, 2001, Kindle location 30); the replacement of street corners and their intersections by traffic circles; substitution of streets by high-speed avenues and residential cul-de-sacs; in place of sidewalk pedestrians, priority to the automobile; and in place of the system of public spaces that Brazilian streets traditionally supported, the structure of a completely different urbanism (Holston, 2001). See Figure 34

Like the knowledge cities, the new growth poles’ landscapes are very similar: land use isolation, low density, long distances and vehicle-friendly environment.
The Brasilia’s Master Plan aimed at fixing the present based on an imagined future. However, it generated controversial spatial results; for instance, transportation inefficiencies because of land-use isolation and long-distance commutes. This in turn contributed to the increase of emissions, exacerbating climate change effects. In addition, it produced social fragmentation and exclusion through the development of illegal settlements – mainly by Brasilia’s construction workers – as a reaction to the government overregulation. Moreover, it compromised street life by benefiting cars over pedestrians and reducing people’s accessibility to public spaces, which consequently promoted insecurity. A contingency plan was developed to address the aforementioned results. However, the radical socio-physical structure originally envisioned by the utopian architects prevailed (Holston, 2001). As a result, the people who have migrated to inhabit Brasilia, have subverted the planners’ “utopian” idea, transforming Brasilia’s urban model into one similar to that of any other Brazilian cities: caught up in the dramatic conflicts of an ever-growing impoverished population of migrants and squatters, uncontrollable real estate speculation, increasing social injustice, marginalization of the poor, and concentration of political decision making and economic wealth in the hands of a small part of the city’s population (De Carvalho, 1989). In his critique The Spirit of Brasilia: Modernity as Experiment and Risk, Holston (2001, Kindle location 354) calls this process the “Brazilianization” of Brasilia (Irazábal, 2014).

In Ciudad Guayana, the Venezuelan government created the Corporación Venezolana de Guayana (CVG), a powerful independent national agency with extensive legal powers and ample funding (Peattie, 1987), which was in charge of managing, planning and developing Ciudad Guayana in accordance with the national economic targets and goals. The CVG, based in Caracas, was a corporate artifact, consciously created to transform the Venezuelan economy from an agricultural- into an industrial-based economy (Peattie, 1987). This public entity developed Ciudad Guayana’s Master Plan, which objectives – namely, economic efficiency, amenity, social equity, and community building (Irazábal, 2004)–were characterized by a modernist spatial planning and an imposing top-down approach. As results, “scattered, large buildings were conceived in vast areas, the social classes were separated, marginalizing the poor outside the “planned city”” (Irazábal, 2004, p. 27). In addition, Puerto Ordaz and San Félix – the two existing towns upon which Ciudad Guayana was created – presented “transportation inefficiencies – long commutes, and traffic congestion over the Caroní River Bridge” (Irazábal, 2004, p. 29). Moreover, the unequal allocation of investment from CVG between the two parts of the city promoted inequalities regarding urban services and amenities. While San Félix lacks basic amenities and facilities, Puerto Ordaz lacks an articulated system of public spaces. Both of them lack human scale, and the visual structure offered by the planners has not
been fulfilled neither in Puerto Ordaz nor in San Félix (Irazábal, 2004). Furthermore, “community building was impeded by the segregation encouraged by defined zoning and enforced housing policies between the two sectors of the city” (Irazábal, 2004, p. 29). Although, a transitional planning period from central-technocratic to local-participatory planning took place since mid-1980s to 1998, decisions regarding major urban infrastructural projects and the preservation and segregated classes in the city were still made by the CVG, resulting in “a reassertion of central decision-making model and plans from the past” (Irazábal, 2004, p. 33); subsequently generating, paraphrasing Holston, a “Venezuelanization” process in Ciudad Guayana.

In Yachay, the Ecuadorian government created Yachay EP – a public enterprise in charge of promoting, managing and developing the Yachay project under the national objectives. Yachay EP, based in Quito, is conceived as a key actor to transform the Ecuadorian economy from an export- into a knowledge-based economy through the construction of Yachay “Knowledge City,” where scientific knowledge generated by Yachay Tech, the first University for Experimental Technology Research in the country, is supposed to be linked with public and private research institutes, technology-transfer centers, high technological level companies, and Ecuador’s agricultural and agro-industrial communities. In order to accomplish that aim, Yachay EP, as a local counterpart, and the Korean firm IFEZ developed the Yachay’s Master Plan.

The Plan organized Yachay –created upon the existing town of Urcuquí – into four main zones: knowledge (productive transformation), industrial technology (innovation systems), responsible agro-tourism (sustainability and ecological tourism), and agricultural and biotechnology (thematic research). This territorial organization was characterized by insensitivity to the physical, social, and historical contexts; excessive scale; land use isolation; low-density development; and long-distance connections (Sorkin 2014). Consequently, the International Think Tank (ITT) was organized to revise, improve and propose a plan of actions on previous proposal. The ITT proposal provided meaningful insights and inputs on architecture, urban design and landscape, which facilitated the development of a new urban design proposal. This new proposal was characterized by the insertion of smart growth concept and principles (transects, place-making and morphological codes), which resulted in mixed land use and gradual densification, high-density development and short-distance connections. However, both IFEZ and ITT proposals, similar to those in Brasilia and Ciudad Guayana, focuses on design rather than process and envisions the final outcome as discontinuous from the present, giving chance to an “Ecuadorianization” process in Yachay.
These processes resulted in people displacement and the development of urban informality in Brasilia and Ciudad Guayana and it is most likely to occur in Yachay, since it shares common features with these growth poles. The results are shown in Figure 35.


This image shows a timeline that compares the urban growth of the three growth poles. In the case of Brasilia, it shows Brasilia’s Master Plan in 1957, Brasilia in construction in the 1960s, the emergence of satellite cities between 1960s – 70s and Brasilia in 2011. In the last map, the highlighted area is considered formal and the rest informal areas. For Ciudad Guayana, it shows schematic plans indicating the urban growth of Ciudad Guayana in a westerly direction over time. In the last map, the red areas are formal and the yellow ones are informal areas. Both growth poles are fragmented in four areas and present informal settlements either at the urban outskirts or within the urban boundary. Yachay is also fragmented from the beginning and its Master Plan does not consider informal urban sprawl within or outside the urban fringe.

The following figures will zoom in into each growth pole to have a better sense of their urban patterns (Figures 36 - 41)
First, Brasilia and its different urban patterns. The difference between the planned, semi-planned and unplanned urban patterns are evident.
Second, Ciudad Guayana and its different urban patterns. Again, the planned, semi-planned and unplanned urban patterns are evident.
Finally, Yachay and its single “planned urban patterns”. However, the planned urban patterns of Yachay are odd and it is unknown how the government is going to managed urban informality.
The development of urban informality generated socio spatial segregation and subsequent people displacement in Brasilia and Ciudad Guayana (Holston 1989 and Irazábal 2004). So, when I refer to urban risks, I mean the development of urban informality within or outside the urban limits of Yachay, socio spatial segregation and subsequent people displacement.

In general, similar planning management models and spatial structures featured the development of these new growth poles since their inception stages. The planning management models were primarily led by government agencies (Novacap in Brasilia, CVG in Ciudad Guayana and Yachay EP in Yachay). None of these agencies were established in the site where the projects were going to be developed (Novacap, Rio de Janeiro; CVG, Caracas; Yachay EP, Quito). These public entities worked under the central governments’ plans and tried to accomplish national objectives to improve the countries’ current situations (changing the Brazilian society by enforcing a new type of urbanism in the case of Brasilia; diversifying the Venezuelan economy by boosting industry in the case of Ciudad Guayana and transforming the Ecuadorian export economy model to a knowledge economy model by constructing a “knowledge city” in the case of Yachay). However, the development agencies and the planners in Brasilia and Ciudad Guayana share responsibilities in the reproduction and intensification of the existing situations – intended to be prevented in these projects – by the very spatial structure of the “planned city” (Epstein, 1963), characterized by social and physical fragmentation, urban informality, transportation inefficiencies, etc. The agencies and the planners caused this contradiction through their allocation of resources, overregulation and “their failure to understand and engage the creation of the cities as” historical, socio-political and technological processes. “They thought of themselves as the lone agents of a transcendental historic transformation” (Irazábal, 2004, p. 27) and, in this process, they implemented top-down approaches. Although there were attempts to refocus these approaches, they were unsuccessful since they focused on design rather than processes, resulting in subversion of the plans by the people who inhabited the “new city.”

The similar linage described above between these case studies regarding their historical-political and economic contexts and objectives, location features, foreign urban influences, and planning management models suggest that Yachay could face similar situations as those presented in Brasilia and Ciudad Guayana. As the examples of Brasilia and Ciudad Guayana show, “planning can yield results that prove to be totally antagonistic to its expressed intentions” (Irazábal, 2004, p. 41) and it can be used as an instrument to construct and legitimate severe social inequalities. Therefore, Yachay becomes a unique
case study to investigate the relationship between urban governance and planning and its influence on the built environment in order to prevent replicating the negative results obtained in Ciudad Guayana and Brasilia.

The common features previously described are summarized in Table 5.

Table 5. Common features among new growth poles in Latin America and Yachay

<table>
<thead>
<tr>
<th>Common Features</th>
<th>Brasilia</th>
<th>Ciudad Guayana</th>
<th>Yachay</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Development</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turbulent historical &amp; political context [military coups, dictatorships or political instability]</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Non-renewable resources / primary product booms [oil and cocoa]</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Utopic objectives [national esteem recovery, national economy diversification]</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Location [rural context]</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Concentration of powers [political, industrial-economic and scientific]</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign urban influences [France, United States or Korea]</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>State management model [Novacap, Corporación Guayana and Yachay EP]</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

● The case study fully supports the statement
Finally, according to the analysis performed, Yachay’s project does not share most of the features present – at the development and operation stages – in successful knowledge cities. However, it does share similar features – at the development and implementation stages – with Latin American new growth poles. Consequently, Yachay cannot be identified as a knowledge city, but a new growth pole, according to this analysis. Furthermore, it could lead to urban problems similar to those generated by new growth poles (i.e. urban informality, socio spatial segregation and people displacement).

5 Conclusion

The conclusions taken from the theoretical approach that evaluate the hypotheses H1, H2 and H3 are:

The existing planning instruments seem to be discursively aligned. However, instruments at the local level [Urcuquí’s Canton Plan and Parishes’ Plans] are either inexistent/incomplete or unconsidered for Yachay’s project development. As these instruments are essential in the National Planning Framework, it is unclear how Yachay’s Master Plan was developed without considering them. It seems to be problems of coordination within the local level and between the local and the provincial and national levels to develop and coordinate these planning instruments.

In addition, the political discourses of public officials seem to be consistent with the existing planning instruments’ goals. However, the actions taken to achieve such goals do not fully match the local residents’ expectations and conditions, which could be a consequence of the lack of planning instruments and coordination at the local level that generates inconvenient, inefficient and ineffective communications channels between the public agencies involved with Yachay’s projects and between their public officials and the community.

Moreover, the citizens’ perception does not fully match the public officials’ discourses. Citizens involvement has been predominantly informative (top-down approach) rather than participative (bottom-up approach) as Nation Plan mandates. Additionally, it has taken place during the project’s implementation stage. There was no citizen involvement during the project’s inception stage.
Therefore, the relationship between the planning instruments, politics and citizens’ perspectives at the current stage of development of the project is at least weak or fragmented.

The conclusions taken from the practical approach that evaluate the hypotheses H4, H5 and H6 are:

The comparative analysis performed between six successful knowledge cities around the world and two Latin American growth poles with Yachay shows similarities and differences. The most significant difference between the six knowledge cities and Yachay is that all the knowledge cities’ examples evolved from already established cities, most of them are considered ancient cities; while Yachay is a new city starting from scratch – envisioned as a new growth pole – that seeks to become a knowledge city. In addition, Yachay’s project does not share most of the features present – at the development and operation stages – in successful knowledge cities. However, it does share similar features – at the development and implementation stages – with Latin American growth poles. Consequently, Yachay cannot be identified as a knowledge city, but as a new growth pole, according to this analysis. Furthermore, it could replicate the negative results obtained by the new growth poles (i.e. territorial inefficiency, urban informality, socio spatial segregation and people displacement) based on their similar lineage regarding their historical-political and economic contexts and objectives, location features, foreign urban influences, and planning management models.

All this evidence together supports my recommendation not to build Yachay in rural context mainly for three reasons. First, it is territorial inefficient because Yachay lies around 15 miles from Ibarra, capital of the Imbabura province. Therefore, it is inefficient to create a new human settlement right next to an existing one, instead of inserting it into the already established urban context as successful knowledge cities proceed. Second, this kind of projects often lead to development of sprawls and urban informalities, as shown earlier. This problem might be very possible for Yachay since it shares similar features with the growth poles case studies analyzed. Additionally, it is unclear to what kind to growth pattern Yachay would take. Third, it has promoted population displacement. Community resentment has already been growing for this project, according to the field survey results. When the Ecuadorian government conceived the city, it carved out territory from the municipality of Urcuí, expropriating property from estate owners and evicting farmers who worked the land. As a result, local farmers and landowners have been progressively displaced, and the government has yet to fully provide just compensation (new job opportunities) to these
indigenous people in spite of the significant efforts from to insert them into the project’s logic.

Therefore, it is time to rethink Yachay.

6 Moving forward

First of all, as mentioned before, it is worth recognizing the Ecuadorian government’s efforts in the search for territorial equity, economic development and social justice by moving from a material-based to a knowledge-based economy through the investment in human capacity, inserting the country into the new millennium’s logic.

However, the current economic scenario experienced by the country demands a new approach for the project. This scenario involves four facts that support my recommendation to rethink Yachay. These facts are: (1) the fall in oil prices (the main mean of financing Yachay’s project), (2) the appreciation of the US dollar, (3) the Ecuadorian’s dollarized economy and (4) the recent 7.8 earthquake that shocked the country’s coastal region, devastating significant portions of 3 cities and several towns, resulting in hundreds of lives lost and millionaires material damages. These facts all together force the government to efficiently allocate resources to rebuild the affected zones and effectively cope the adverse economic situation. One effective way to achieve this goal is by rethinking Yachay’s location.

Yachay’s location in a rural area– starting from scratch– would hardly generate territorial equity, economic development and social justice. Conversely, as it would comprise public and private research institutes, technology-transfer centers and high technology companies, it could generate the same results obtained by the economic booms last century, exacerbating existing territorial disparities and promoting a colonial dependence between Yachay and its surrounding areas (i.e. Ibarra). Thus, a major challenge for Yachay is to avoid an essentially colonial relationship with Ibarra, in which it becomes home to elites and the surrounding settlements home to service workers and the poor, becoming a catalyzer of territorial informality.

Additionally, Yachay’s location in a rural area has required a land-expropriation process which, according to local residents, has not involved just compensation (new job opportunities) and appropriate
relocation procedures. Seven large farms—70% of the project's area—have been expropriated. Five of them housed approximately 85 families. Most of these family members worked as farmers for several years and after land expropriation they had to move without appropriate relocation assistance. This has sparked social unrest and hampered agricultural production in the region because of reductions in the agricultural labor force and agro-industrial jobs. This also compromises the project's social justice objectives.

These challenges could be addressed by reconsidering Yachay's location and rethinking it within an existing urban area. This is how most successful knowledge cities case studies—such as Barcelona (Spain), Munich (Germany), or Dublin (Ireland) have proceeded. They have been developed in urban—not rural—areas to take advantage of the existing urban potential and strengthen the social fabric, using resources efficiently.

The creation of Yachay Knowledge City has become an emblematic project for an Ecuadorian government seeking to enhance the quality of education. Proposals have been discussed, but there are still relevant territorial and social gaps to be bridged. In this regard, reconsidering Yachay’s location within an existing urban area could become an effective way to bridge these gaps and redirect the project. This redirection does not involve the creation of a new growth pole (i.e. starting from scratch) but rather boosting infrastructure and improving service provision within an existing urban settlement, thus transforming it into a knowledge-based zone—in other words, inserting Yachay project’s requirements into an existing urban settlement. For this purpose, vacant lots and buildings belonging to the state within the selected city could be used to build and house the infrastructure to meet Yachay’s requirements. This infrastructure could be strategically located across the city to (re)activate neuralgic urban points, formalizing informal settlements through the development of the knowledge cities’ features analyzed in this research. In this sense, the project would become a catalyst of territorial equity and social justice on a local scale, where the land-expropriation process would be unnecessary. In addition, preservation of agricultural land would be achieved and democratization of the access to goods and services would be promoted. However, redirecting Yachay’s project demands a decisive political will, popular support and technical assistance.

Finally, as Michael Sorkin (2014)—private consultant involved with Yachay project’s International Think Tank—noted, the opportunity for innovation—for bridging the urban and rural, formal and informal, technical and traditional—is galvanizing. The future urban development of Yachay, Ecuador and Latin
America depends on the ability to properly insert scientific knowledge into their societies in accordance with the socio-cultural, economic, political, technological and historical contexts in order to guarantee territorial equity and social justice within the region.

7 Bibliography


Plan de Desarrollo y Ordenamiento Territorial Provincia de Imbabura (), Secretaría Nacional de Planificación y Desarrollo (SENPLADES)

Plan de Desarrollo y Ordenamiento Territorial Cantón Urcuquí (), Gobierno Autónomo Descentralizado Municipal del Cantón Urcuquí (GADM-CU)


Appendix

1. Gender
   - Female
   - Male
   - Other

2. Age
   - 20-24
   - 25-29
   - 30-34
   - 35-39
   - 40-44
   - 45-49
   - 50-54
   - 55-59
   - 60-64

3. Level of education
   - Elementary
   - Secondary
   - Undergraduate
   - Graduate
   - Post-Graduate

4. How long have you lived in Urcuquí?
   - < 5 years
   - 5-10 years
   - 10-15 years
   - >15 years

5. Economic activity
   - Agriculture (type)
   - Livestock (type)
   - Textile manufacturing (type)
   - Commerce (type)
   - Tourism (type)
   - Other:

6. Type of economic impact of Yachay City of Knowledge construction
   - 1 Very Bad
   - 2 Bad
   - 3 Irrelevant
   - 4 Good
   - 5 Very Good

7. Level of economic impact
   - 1 Very Low
   - 2 Low
   - 3 Moderate
   - 4 High
   - 5 Very High

8. Level of disturbance generated in Urcuquí by the construction of Yachay
9. Level of quality improvement on basic services provision and coverage since the construction of Yachay’s project

- Very Low
- Low
- Moderate
- High
- Very High

10. Yachay City of Knowledge as an opportunity to improve the quality of life

- Very Bad
- Bad
- Fair
- Good
- Very Good

11. Project socialization in Urcuquí

Yes (How?)

No

12. Project socialization regularity

- Never

13. Your participation/role in this project as local resident

14. Urcuquí residents’ citizen participation/involvement in Yachay’s project

- Highly Passive
- Passive
- Incipient
- Active
- Highly Active

15. What kind of native/ancestral knowledge can be found in Urcuquí?

16. What kind of native/ancestral knowledge is considered in Yachay City of Knowledge?

17. Expropriation process

<table>
<thead>
<tr>
<th>Economic compensations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>
### Physical relocation

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unknown</td>
</tr>
<tr>
<td>2</td>
<td>Inappropriate</td>
</tr>
</tbody>
</table>

18. Notes
Appendix 2b. Researcher and local residents (surveys)