

URBAN ANDES

EDITED BY VIVIANA D'AURIA, WARD VERBAKEL,
BASIL DESCHEEMAER

Against the backdrop of climate change and intensifying human occupation, explorative design strategies can play a role in recalibrating the relation between landscape logics and urbanization patterns in the Andes.

LAP 01

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A

URBAN ANDES

DESIGN-LED EXPLORATIONS TO TACKLE
CLIMATE CHANGE

LEUVEN UNIVERSITY
PRESS

EDITED BY
VIVIANA D'AURIA,
WARD VERBAKEL,
BASIL DESCHEEMAER

LAP

The peer-reviewed series LAP (*Landscape and Architecture Projections*) focuses on design research in the fields of architecture, urbanism and landscape. It seeks to highlight innovative practices worldwide which boldly address the most pressing socio-political, ecological and spatial issues of the contemporary times. It emphasizes work which is developed in cooperation with activists and civil society, various governmental and/or development agencies and stakeholders as well as with other experts.

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FOREWORD

This publication launches LAP, a new series on landscape and architecture design research. From a theoretical as well as an applied perspective, design-led research has the potential to contribute to both international academic discourse and the tacit knowledge embedded in localized transformation practices. The intrinsic nature of the design field to revisit, recombine, and reformulate disparate pieces of knowledge in a circular, not always linear manner is part of this LAP series' DNA. Consequently, it explicitly uses visual components as an important and essential foil to textual insights. Through this series we pursue a diversity of design and research practices that occur beyond mainstream sites, assignments, and programmes. Here, as demonstrated in this first issue, the emphasis will fall on design-led research developed in cooperation with civil society, local and international stakeholders, governmental and non-governmental agencies and several experts.

The idea of urbanity is linked to the Andes in the collective imagination, primarily through the iconic image of Machu Picchu as seen from the top of adjacent Huayna Picchu: an abandoned Inca city, perched on a mountaintop, under siege from the surrounding nature. The claim of LAP 01 for the present-day Andes as urban—and to claim this urbanity not as a smattering of isolated exceptions but as a condition that permeates large portions of the region—is to challenge this all too picturesque notion and to acknowledge existing and long-standing regional realities. Conversely, to attach the attributive 'Andean' to the concept of urbanism raises a different set of questions. How do cities develop in a context so hostile to concentrated human presence? What manipulations of the land are required? What form might a sustainable urbanism in

the Andes adopt, and how can this urbanism engage with the existing and future effects of climate change?

The texts and design research projects collected here focus on a specific Peruvian case: the catchment of the Cachi River and its main city, Ayacucho. The work does not attempt to formulate a 'unifying theoretical framework' for the Urban Andes, and the case study does not claim to represent urbanization in and of the Andes at large. Rather, the aim is that these design-led and site-specific reflections serve as an introduction. For an audience from the Global North: to a portion of the Andes, through one example of its settlement, and to a set of indigenous practices and their potential to formulate answers to contemporary challenges of climate change. For an Andean audience: to pay homage to landscape urbanism and design methods which may (or may not) be new to them.

On the one hand, it is a synthesis of the knowledge and design strategies collected and developed through a research project called 'Urban Andes', initiated by the KU Leuven Faculty of Engineering Sciences' Department of Architecture, the *Centro de Competencias del Agua*, and their partners in 2018-2020. That collaboration consisted of several exchanges (workshops, debate, seminars, lectures, and research) along with extensive fieldwork and stakeholder interaction. This synthesis reconsiders and reconfigures the heterogeneous pieces of information and knowledge acquired. It gains coherence through several narratives that include design research, interpretative mapping, and hypothetical strategies for future territorial transformations. On the other hand, this publication is premised on the hope of it forming one of the bases for next steps: a re-expansion of this compressed essence towards new lines of research, additional design

proposals, new collaborations, local interventions, and engagement with other Andean contexts.

The first part of the LAP 01 publication draws up the *frame* in which this collaboration and research takes place. It unpacks a broader investigation of the particularities of urban and landscape practices in the context of the Andes and their challenges in a changing environment. The interdependency of the Cachi Basin and the city of Ayacucho is explored

both as a theoretical discourse and as a set of parallel narratives in which image and word merge into a graphical essay. The second half of this publication looks ahead through a *projection* constructed from a multitude of design strategies, workshop concepts, and a shared discourse on future directions.

Basil Descheemaeker,
Ward Verbakel



(RE)FRAMING THE URBAN ANDES

MARGARITA MACERA CARNERO
& MONICA RIVERA MUÑOZ

Andean urbanism, a co-evolution of landscape and settlement(s)

Contemporary Andean cities like Ayacucho appear to be a paradox (Makowski, 2008). Since the fifteenth century, intermontane valley sites were not places of human agglomeration—nor were they sites of permanent occupation—but rather administrative and ceremonial locales as well as resting areas for armies passing through (Mumford, 2012; Tello, 1921, 1942). Low-valley settlements were merely part of broader and diffused networks of self-subsistence that sustained agro-pastoral economies. For a long time, Andean ‘urbanism’ relied upon resilient agro-pastoral regimes that adapted to cyclic variations in climate and the rise or collapse of pan-Andean states. Andean cities—as we know them today—are on the other hand detached from these enduring regimes that were embedded in the landscape. Established during the Spanish regime (1532–1821) with no consideration for pre-existing settlement patterns, ‘cities’ served as colonial outposts for the (limited) Spanish colonial elite—in addition to government, market, and church institutions. In the twenty-first century, as a result, Andean cities like Ayacucho have had to synchronize their development with the long-term socio-ecological dynamics that preceded their making. In the face of global climate change, and particularly in water-scarce contexts and semi-arid regions like Ayacucho, Andean resilience urgently calls for a re-articulation of urbanization and its position within broader landscape dynamics.

In terms of water shortage, notable precedents of Andean resilience during drought date back to the twelfth century. Not by chance, a period of regional drought coincided with the collapse of the pan-Andean states of Wari and Tiahuanaco—with Ayacucho (Peru) and La Paz (Bolivia) as their respective capital cities (Macera, 1978; Tello, 1929, 1942). To overcome water scarcity, agricultural activities shifted from low-valley maize agriculture to tuber cultivation in the highlands, which could bear lower

temperatures, frosts, and water scarcity. By adapting to changes in production regimes, large populations migrated to higher altitudes (between 3.500 and 4.200 meters), in addition to these new crops (Kellet, 2010). At the same time, highland migration facilitated access to pastoral and water resources from adjacent headwater areas. Competition over resources led to the construction of neighbourhoods on mountain peaks, where panoramic views allowed for the maintenance of defensive positions. By the time the Incan state surged to prominence in the mid-fifteenth century, hilltop and mountain-slope settlements predominated, located adjacent to scant pockets of fertile land, be these natural or artificial. Alongside drastic changes in land production systems, such a settlement location strategy allowed Andean populations to thrive despite stark environmental challenges.

In Ayacucho, known as Huamanga during the Incan empire, Andean communities established social and landscape systems to overcome overall scarcity. By necessity, solidarity among members of same ethnic groups led to mechanisms of production and redistribution of goods based on reciprocity, not to mention across ecological floors (Murra, 1972; Pulgar Vidal, 1946)). Significant differences in microclimates across short vertical distances (Tosi, 1960) enabled dispersed communities to specialize in the production of certain crops and goods. Mechanisms of exchange allowed these communities to pool resources and consequently have access to otherwise unattainable products. Accordingly, settlement patterns and productive systems stretched from highland plateaus to coastal plains and rainforest valleys. In headwater areas (above 3.500 meters altitude), networks of constructed *qochas* (rain-fed water catchments) and afforestation practices (mainly of *polylepis*) increased water retention (Tello, 1942). Extensive canal systems made it possible to transport water to massively constructed *andenes* (agro-pastoral terraces) located on mountain slopes situated below 3.500 meters. Such comprehensive manipulation of the landscape

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PARALLEL NARRATIVES FOR CITY AND BASIN

BASIL DESCHEEMAEKER, WARD VERBAKEL,
LOUISE BLANCQUAERT, ELISABETH DE CLERCQ,
THOMAS HAWER, WILLEM HUBRECHTS,
SIGRID VANGENEUGDEN, VIVIANA D'AURIA

The interrelationships between the ecology and landscape of the Cachi River basin and its indigenous, colonial, and post-colonial inhabitation cannot be contained in any one story. Instead of attempting to formulate a ‘unifying theoretical framework’, we frame the topic from three thematic entry points: water, human settlements, and soil. While each thematic part functions as a stand-alone narrative, it is in their parallel reading that the richness of the subject becomes most apparent.¹ The narratives take the form of a graphical essay that combines text and image in one continuous flow.

1 This triple narrative does not claim to be ‘complete’ either. The three parallel narratives represent the frame used throughout the Urban Andes project research and design explorations. Other readings and points of view can and should be added

to further deepen the understanding of the territory.

2 The Köppen-Geiger classification for Ayacucho (alt. 2.750 m a.s.l.), the basin’s primary city, is BSk or ‘cold semi-arid climate’.

3 CCA, 2017

4 Drenkhan et al., 2015

5 Maldonado Fonkén, 2014

THE LIFE FORCE OF THE MOUNTAINS

A natural hydrology

The Cachi River basin, situated in the sierra or Andean highlands of Peru, is a far-flung portion of the vast Amazon watershed. Its headwaters are found at an altitude of ca. 5.000 m a.s.l., and it flows into the Mantaro River at 2.150 m a.s.l.. The basin's climate is semi-arid,² with a long dry season lasting from April to November, and a short wet season. ^{→fig. 1-5}

In the highest reaches of the basin, frequent sub-zero temperatures cause this seasonal precipitation to accumulate in the form of snow and glaciers.³ Additionally, natural lakes—known as *gochas*—retain rain—and meltwater.⁴ Throughout the year, the glaciers and *gochas* gradually release their stored water, allowing it to infiltrate into the soil and reappear elsewhere as natural springs (known locally as *ojos de agua* or 'water eyes'). These springs in turn feed the *bofedales*: spongy wetlands located in the upper basin that further slow the downhill flow of water.⁵

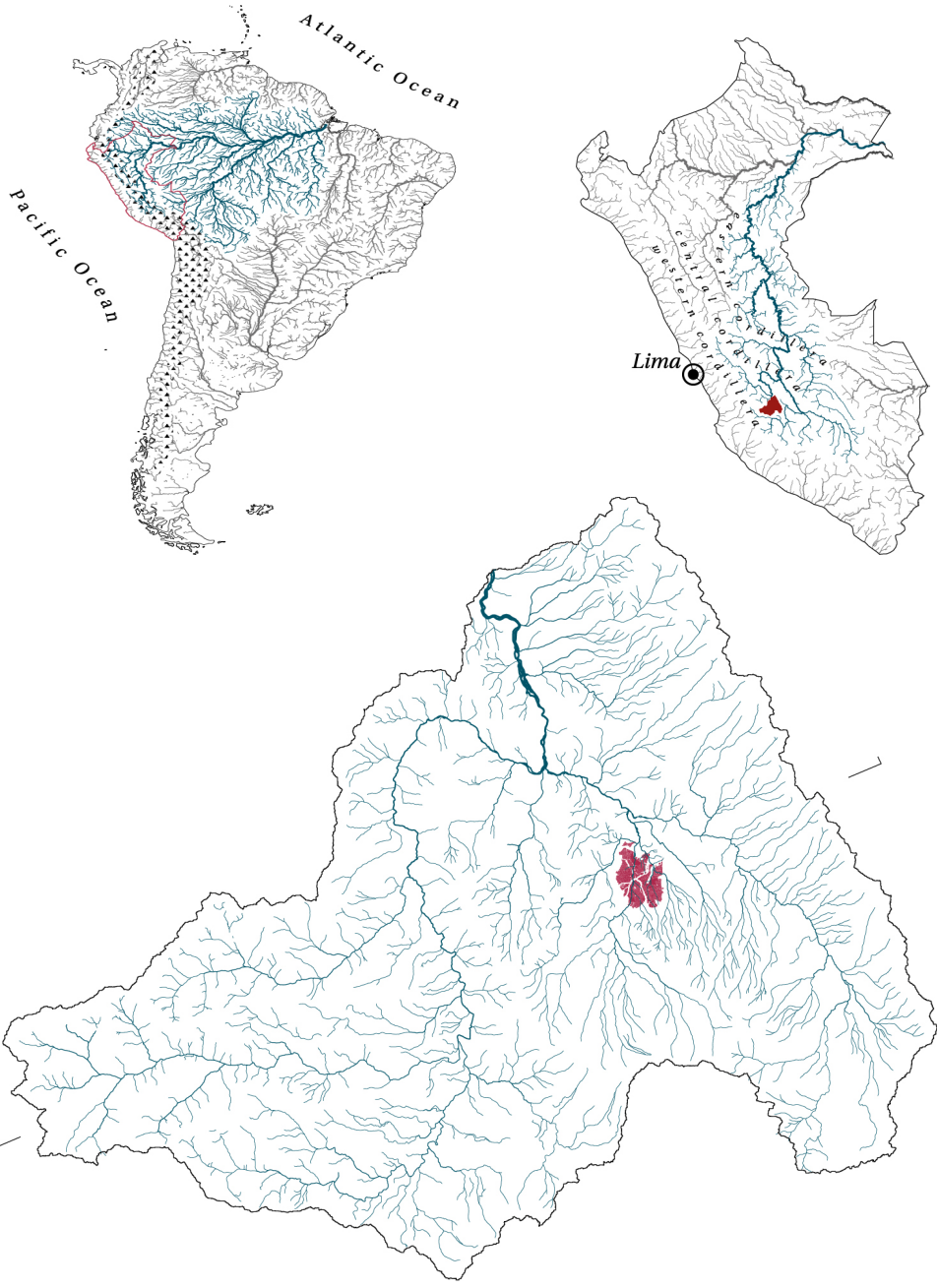


fig. 1-2

fig. 3

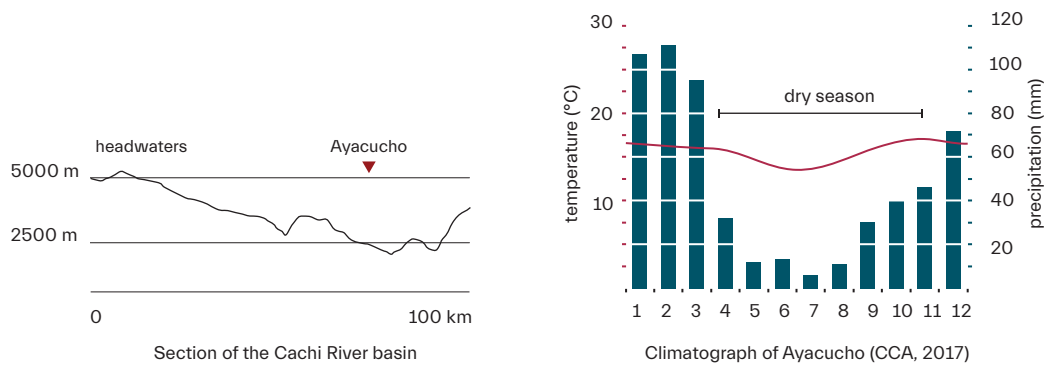


fig. 4-5



The combination of glaciers, *qochas* and *bofedales* plays a crucial role in the natural hydrological system of the basin. They form an enormous buffer, providing the areas downstream with a year-round supply of water even during the dry season.

Starting in pre-Incan times, a dispersed structure of smaller settlements has formed that is strongly linked to this hydrological system.⁶ The vegetation of the *bofedales* is grazed by livestock—historically camelids such as llamas and alpacas, though currently also cattle and sheep. Where an additional supply of water is required, natural depressions in the terrain are enclosed with small dams, creating artificial lakes that are likewise called *qochas*. From here, the flow of water to adjacent fields can be regulated via simple irrigation systems. This sensitive and measured relationship to water is engrained in the Andean cosmovision, which considers the flow of water to be the ‘life force of the mountains’.⁷

6 Lumbreras, 2006, p. 18

7 *La sangre de las montañas* (Miranda Zambrano, Lindo Revilla, Santana Paucar, 2000, p. 215). Although

a more precise translation of *sangre* would be ‘blood’ or ‘life-blood’, the choice was made to stay away from translations that might (incorrectly)

refer to the armed conflict that took place in the region at the end of the 20th century (see further).

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TABLE OF CONTENTS

A FRAME

B PROJECTION

3	FOREWORD
7	(RE)FRAMING THE URBAN ANDES
21	PARALLEL NARRATIVES FOR CITY AND BASIN
89	WORKSHOP #1 FROM BASIN TO CITY
103	THESIS EXPLORATIONS EMERGING NEIGHBOURHOODS
131	WORKSHOP #2 (RE)DEFINING AYACUCHO
153	AN ONLINE CONVERSATION

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Editors

Viviana d'Auria, Ward Verbakel,
Basil Descheemaeker

Contributing Authors

Louise Blancquaert, Viviana d'Auria,
Elisabeth De Clercq, Basil Descheemaeker,
Thomas Hawer, Willem Hubrechts,
Margarita Macera Carnero, Monica Rivera
Muñoz, Sigrid Vangeneugden,
Ward Verbakel

External review

Camilo Pinilla Castro

Translation

Fahri Abdala, Simon Laflamme

Copyediting

John R. Eyck

Graphic design

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Viviana d'Auria is an associate professor in international urbanism at KU Leuven and co-head of the Urban Design, Urbanism, Landscape and Planning division.

Ward Verbakel is partner at plusoffice architects, guest professor at KU Leuven, and member of the artistic board of A+ Architecture in Belgium.

Basil Descheemaeker is a Brussels-based architect and landscape designer, and guest lecturer at UCL-LOCI.



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