

Andean rituals and building construction: physical and symbolic infrastructures

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Abstract: This work explores the relationship between Andean rituals and building construction in the cities of La Paz and Cochabamba. Its objective is to characterize the connection between the Andean ritual of offering to Pachamama and the building construction process, revealing the particularities of the rituals and their relevance in these constructions. The study describes and analyzes the social and spatial acts aimed at ensuring social and symbolic security around construction. To this end, a review of previous research and related documents was conducted. The investigation is based on ethnographic work, including participant observation, interviews with builders, "Yatiris," owners, and other key actors, as well as surveys of the inhabitants of these buildings. The results reveal the existence of two types of infrastructures: a physical infrastructure and a symbolic infrastructure. The latter provides protection, harmony, and social cohesion, strengthens community identity, and reinforces social relationships around the construction process. While the rituals do not technically determine the construction of the buildings, they contribute to the realization of the works under a logic of social sustainability.

Key words: Andean rituals; symbolic infrastructure; building construction; Bolivia

1 Introduction

In Bolivia, particularly in the cities built along the Andes mountain range, offerings to Pachamama are a constant practice for a wide variety of social groups. This practice is not unique to the Quechua and Aymara cultures, although their members or descendants are the primary practitioners.

While in several countries in the region these practices have disappeared or are in the process of disappearing, in Bolivia the practice of rituals has grown stronger and is being passed down from one generation to the next with greater vigor [1].

One of the key contexts where these ritual and offering practices take place is the construction of homes and civil works, which, due to their nature, involve risky activities, the participation of many people, and significant financial and other investments—all of which necessitate not only physical but also spiritual protection.

These practices have been frequently studied from the perspectives of sociology and anthropology, but very little research has been conducted from the perspective of architecture and related disciplines. Construction processes in Andean cities involve, in their course, the development of various rites dedicated to Mother Earth and other deities, whose importance and role in the physical construction process, in socio-labor relations, and other areas, remain a significant subject of research. While there are references, there is still little evidence of how this influences and shapes construction processes and architecture itself.

The ritual practices rooted in Andean communities date back to pre-Hispanic times, when the performance of various rites was a daily occurrence and a planned, essential event for the indigenous peoples [2]. The purpose of these rites was to ask guardian spirits for a series of favors or concessions in exchange for offerings, which — with significant changes in form—have persisted to the present day in various spheres, of which construction is one of the main ones [3].

Taking this into account, the objective of the research underlying this study was to characterize the relationship and impacts between the Andean ritual of offering to Pachamama and the building construction process in the cities of La Paz and Cochabamba. Since the 2010s, more than 50% of the country's construction has been concentrated in the central region, with Santa Cruz, Cochabamba, and La Paz accounting for the largest shares, in that order [4]. Of these cities, the Andean rituals related to construction are practiced most frequently in Cochabamba and La Paz because they are cities with a predominantly Quechua and Aymara population that has maintained the ritual traditions relevant to this study. This fact justifies the selection of these two cities for the research.

To achieve the objective, the research was conducted between 2022 and 2023, the period during which this initiative emerged and aims to assess the current state of this phenomenon. It seeks to identify the characteristics of the Andean ritual of offering to Pachamama, explain the ritual and construction differences in both cities, and decipher the influence of these factors on building construction processes.

The following document is divided into five parts: The background section presents references to the three most studied aspects of the topic, the Andean worldview regarding Pachamama, ritual practices in construction, and an explanation of the variety of offerings to Mother Earth. The theoretical framework focuses on characterizing Andean rites related to construction and is divided into three parts: the first part reviews references regarding Andean rituals and their symbolic value for human beings; the second part addresses the participants in the celebrations; while the final part highlights the specific characteristics of the offering. The methodological section explains the procedures applied for data collection, the tools used for interpretation, and the analytical approach to the results in accordance with the research objectives. Next, the results are presented, organized according to the components of the objective and its parts, as well as the two cities studied. Finally, the results are discussed within the theoretical framework and in relation to the technical and symbolic characteristics of the construction practices.

2 Theoretical references

The following section reviews the main theoretical and conceptual references related to ritual and construction processes, as well as the set of elements that comprise them.

Architecture and rituals have been intrinsically linked since ancient times, with structures designed specifically to facilitate ritual and ceremonial activities [5]. Buildings constructed for these activities not only reflect a society's beliefs and values but also serve as spaces where rituals come to life and acquire meaning.

Three types of architectural features directly related to ritual can be distinguished: temples and places of worship, funerary structures, and everyday architecture: the first manifested (and continues to manifest) itself through the construction of temples in ancient civilizations, such as the Mesopotamian ziggurats and the Egyptian pyramids, which were built specifically to host religious rituals, serving as points of connection between the human and the divine [6]. In the Western world, medieval Gothic churches in Europe stand out; with their high vaults and stained-glass windows, they were designed to create an atmosphere that inspired reverence and spirituality during Christian rituals [7]. Among the second type, royal tombs in China stand out, which served not only as places of eternal rest but also as settings for complex funerary rituals intended to ensure the transition to the afterlife [8], or pyramids such as those at Teotihuacán and Chichén Itzá, which were epicenters of rituals involving sacrifices and astronomical ceremonies [9]. Finally, everyday architecture

is also relevant, such as Roman houses, whose atria and peristyles were designed to incorporate daily ritual practices, such as offerings to local deities [10], or Japanese architecture, which incorporated Zen gardens and tatami mats to facilitate the practice of meditative and contemplative rituals [11].

In the Andean world, rituals and architecture also share a fundamental link, primarily in relation to offerings to Pachamama, which manifests through 1) design and symbolism aligned with natural features such as mountains and rivers—considered sacred and arranged to facilitate the performance of rituals and offerings to Pachamama. Architectural spaces are integrated with the natural landscape and the symbolic elements of the Andean worldview. 2) ritual spaces such as altars, plazas, and courtyards that are specially designed for offerings and ceremonies, 3) materials and construction, through the use of stones, earth, and other natural elements that are not only practical materials, due to their abundance, but also have deep spiritual significance, connecting physical structures to the earth and Pachamama, 4) cultural continuity and transmission, related to the role of architecture in the continuity of ritual traditions, whose function is not merely to serve as a physical space but as a repository of cultural meanings and practices.

Regarding rituals, these have been an essential part of human life; they act as bridges between people and the forces of nature and creation, are intrinsic to human beings, form part of their cultural identity, and although their forms may vary, their function is to connect the human with the divine [12].

Rituals involve interconnected actions, words, and acts of worship. They are led by individuals considered wise, who have a special connection with the divine. Rituals are performed in places designated exclusively for this purpose, often involving sacred objects reserved only for these special occasions [13].

The true importance of rituals lies in their ability to connect people within a community or culture to their beliefs and religion, strengthening the sense of belonging within the community and enabling a more effective organization of group life [14].

In the context of the Quechua and Aymara cultures of Bolivia's Andean region, Pacha-mama (mother of all) is venerated as the deity of the earth, fertility, and nature. She is recognized as a protective mother who sustains human life and requires reciprocity through offerings and rituals. This relationship of reciprocity is the foundation of the Andean worldview, where it is believed that everything received from nature must be returned as a gesture of gratitude. There are several rituals, and the most common is the Challa, which is performed on the first Friday of every month and in February and August in a special way related to agricultural cycles. The rituals involve offerings that may include food, coca leaves, alcohol, and animal fat (usually from llamas), as well as symbolic elements such as numbers, colors, cardinal directions, and shapes. These offerings are buried in the ground as a gesture of gratitude and to ensure good fortune and fertility in the coming year [15]. The connection with Mother Earth is often symbolized by small mounds of stones in sacred places, such as mountain peaks or crossroads, known as apachetas. In urban areas, it is now possible to find these apachetas in places significant to the local population. This reflects an adaptation of the traditional practice to the urban environment. An important feature of these rites is that, today, they are intertwined with Catholic practices. At times, the offerings and rituals are performed alongside Catholic masses or prayers, reflecting a syncretism [15].

2.1 Andean rituals and their symbolism

In Andean rituals, numbers play a special role because each reference to quantity carries connections to elements of the Andean worldview. Numbers are based on the base-four or tetralectic number system (shuk, ish kay, kimsa, chusku), the essential structure of the four-pointed geometric figure, the chakana. The Andean numbering system starts with zero (illak), which constitutes totality, the whole, and is the starting point of the numerical sequence. Each number carries a mathematical cultural, and social value, and its applicability is broad.

In rituals, the number three (Kimsa), (achik—number of light, the trinity, mediation) is considered sacred under the trivalent logic that characterizes the Andean worldview. This logic also stems from the three-level space or worlds (hanan pacha, kai pacha, uku pacha), Figure 1, which further determines how Andean people relate to others and to the whole [16].

Colors hold significant value in Andean culture because they also represent elements of nature. White represents fertility and abundance; yellow and orange are associated with the spirits of ancestors and gold; while red is used in rituals related to sacrifice. Green symbolizes fertility; brown is associated with evil; violet represents suffering; and black represents death [17], Figure 2.

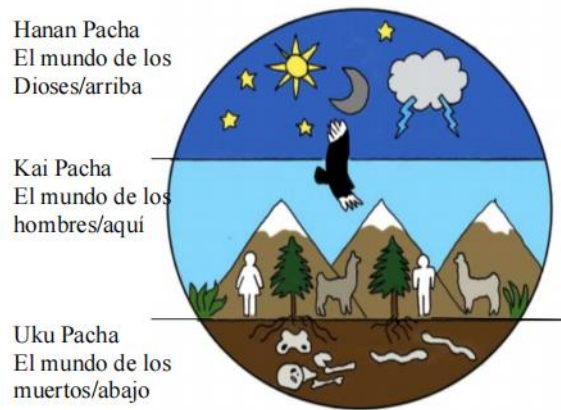


Figure 1. The three worlds in the Andean worldview. Source: created by the author, 2022

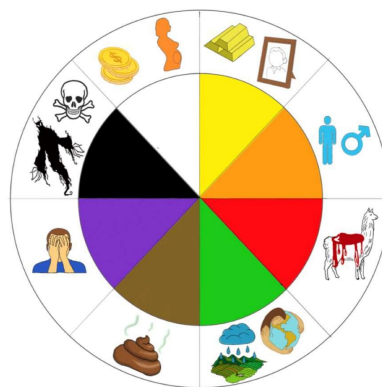


Figure 2. The colors. Source: author's own work, 2022

The cardinal points also hold significant meaning because each of the four points is associated with an animal, and each represents specific values. Each cardinal point also radiates a different type of energy and influences people's daily lives, Figure 3. The chakana is the primary representation of these points. The East is considered the main point, because the sun rises from that direction, while the West is associated with the negative, because it is where the sun sets. The right (facing north) is related to the East and the upper position, while the left is related to the West and the lower position. The North is considered beneficial, while the South is associated with the harmful [18].

Shapes are also key elements in Andean symbolism. The concept of unity is called "Pacha," [everything], "world," "plane" [...] and represents all spatial unity. It is iconologically expressed in the sign of the "square" [19]; the idea of time is expressed with a circle or circumference; the idea of a "just connection" is expressed in a guiding polyvalent matrix; the idea of space-time links a square/cube with a circle/circumference, Figure 4. Similarly, the square and the circle also represent the parity and complementarity of the masculine and the feminine.

Andean rituals involve offerings and sacrifices, such as llamas and rams, which are offered in ceremonies alongside a ceremonial "table" containing various elements, ranging from plants and minerals to animal parts and symbolic objects.

The administration and management of this group of symbols requires a guide, a sage, or an authority figure who guides the community on its path. This guide is usually called a "Yatiri" and plays a fundamental role in the ritual.

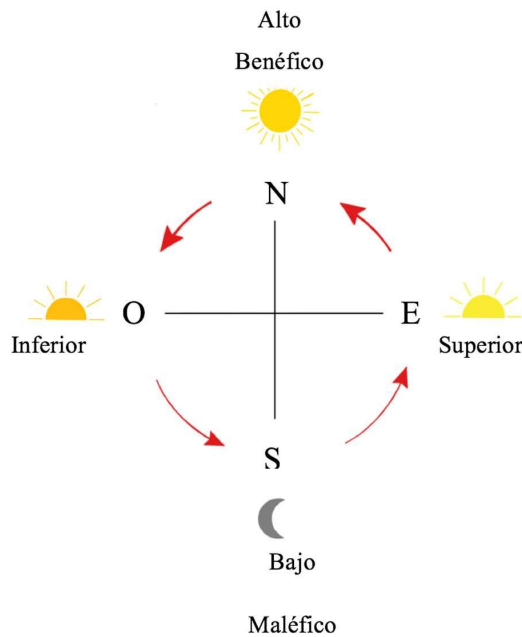


Figure 3. Cardinal points. Source: author's own work, 2022

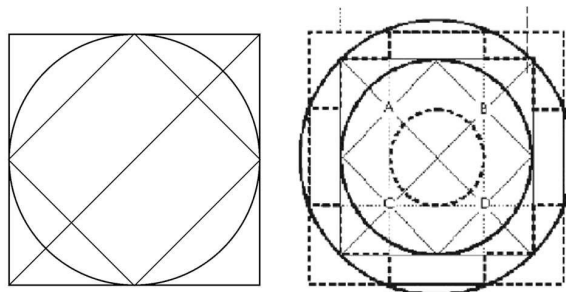


Figure 4. Square and complementary circle. Source: author's own work, 2022

2.2 The Yatiri and the role of rituals

The Yatiri is a spiritual leader and advisor to the community; he plays a crucial role in the preparation and execution of these rituals, determining the appropriate time and place to carry out the ceremony.

The relationship between rituals and architecture in Bolivia is significant, as these directly affect the construction process of buildings, influencing workers and building owners, as well as the foundation, structural, and roofing phases of construction. This means that architecture and construction professionals must consider these cultural influences when planning projects [20] because their practice provides protection against adverse events.

2.3 Offerings and sacrifices

Indigenous peoples and the general population continue to perform Andean rituals in order to seek protection and good fortune. These rituals often involve the sacrifice of llamas and rams, which are offered during ritual ceremonies on a "table" [21].

- The table

The table or waxt'a is a ceremonial food offering to Pachamama that has endured to the present day. The table is associated with a message, warning, reception, or symbolic payment to Mother Earth [22]. The items used to set up the table come from various sources, and its surface may feature plants, stems, flowers, fruits, seeds, etc. It also includes materials of animal origin such as wool, fat, and fetuses (Sullus in the Quechua language). Other frequently used elements are stones and crystals. Figure 5 displays in detail each of the elements that make up the table arrangement in the waxt'a [23], along with photographs.

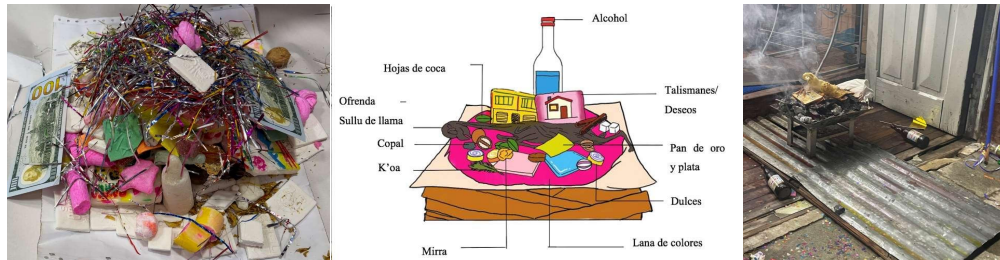


Figure 5. Elements comprising the offering table. Source: own photographs and compilation based on fieldwork, 2023

Architecture and rituals are intrinsically connected and reflect the beliefs and values of societies through temples, funerary structures, and everyday architecture designed for ritual activities. In the Andean world, this relationship manifests in the integration of natural and symbolic elements into architecture to facilitate offerings to Pachamama. Rituals, essential to cultural identity, connect the human with the divine through numbers, colors, cardinal directions, and symbolic forms, under the guidance of Yatiris. These rituals influence the construction process, making their knowledge and understanding indispensable for the practice of building.

In light of the foregoing, the following section outlines the methodology followed in the primary research that forms the basis of this article.

3 Method

The research supporting this text aimed to characterize the relationship between the Andean ritual of offering to Pachamama and the construction process of buildings in the cities of La Paz and Cochabamba. It was conducted between 2022 and 2023 and included buildings located in districts 1, 9, and 12 of the municipality of Cochabamba and districts 3, 4, and 20 of La Paz, due to the high number of high-rise buildings and the existing real estate dynamics in those jurisdictions, as well as the presence of diverse social groups inhabiting them.

The work was divided into three stages: the first involved data collection, the second involved data processing and analysis, and finally, the drafting of the research report and this article.

The information gathering was conducted in two phases. The first phase involved reviewing secondary information from previous studies, university research, and social science books related to Andean rituals, including academic articles, government reports, and historical documents. The analysis of these documents allowed for contextualizing the practice of Andean rituals within the framework of Andean culture. No studies of this type were found from an architectural perspective. The second phase involved six months of fieldwork. This included data and information collection through interviews, surveys, and participant observation.

A total of 20 interviews were conducted with builders, architects, masons, vendors of ritual tables, Yatiris, and professionals specializing in various areas of the construction field, as well as social researchers in anthropology and history. The interviews were semi-structured, meaning they followed a guide of open-ended questions that allowed for the

collection of detailed information on the practice of Andean rituals during the construction process. Surveys were conducted with a sample of 120 people, including property owners, workers, and neighbors of construction sites in the cities of La Paz and Cochabamba. The surveys were designed to gather information on the perceptions of those involved in the construction process regarding the influence of Andean rituals. Participant observation consisted of passive attendance at five Pachamama offering ceremonies in the cities of La Paz and Cochabamba. This observation allowed for the recording of the ceremony's details, its stages, and the interactions among participants.

The data and information collected were processed using Word and Excel software packages to organize quantitative and qualitative information. Once the data had been cleaned, organized, and classified, quantitative analysis was conducted using descriptive statistical tools in SPSS, aimed at detailing the characteristics of the studied population, the rituals, and their practice. Qualitative analysis was conducted using tools such as Atlas TI; content analysis sought to clarify the nature of the rites and their connection to construction. The application of these tools made it possible to identify and uncover facts and values not previously available in the literature, to characterize the relationship and impacts of the Andean ritual of offering to Pachamama and the building construction process, along with other relational aspects.

Finally, the research report and this article were drafted. The characteristics of the Andean ritual of offering to Pachamama, the differences between the rituals in both cities, as well as the influence of these factors on the construction processes of the buildings are discussed in the following section.

4 The Andean ritual of offering to Pachamama in La Paz and Cochabamba

Andean rituals in construction are an expression of the culture and faith of the population and are practiced in many cities across the Andean region. In Cochabamba and La Paz, they are a fundamental part of construction processes and are based on the belief that Pachamama is a living being who must be respected, and that the construction of a house, a building, or any other structure that violates her integrity is an act that must be carried out with the permission and blessing of this deity at different times and through various rites.

The aspects detailed below stem from the systematization and analysis of the information collected through the instruments indicated in the methodology section.

4.1 Characteristics of Andean construction rituals

The rites take place at times corresponding to the stages of the construction process. According to the research, the characteristics of construction rituals vary by city. In La Paz, three rites are performed during the construction process: the first during the laying of the foundation, that is, when the excavation disturbs Pachamama, and its purpose is to atone for this act of desecration and obtain Mother Earth's permission to continue the work. Pachamama receives an offering consisting of a w'axta with food, drinks, flowers, and other symbolic items. The second ritual is performed during the construction of the floor slabs. Its purpose is to ensure the stability of the structure, and to this end, an offering is placed at the base of each column. This consists of a stone, a coca leaf, and a candle. The third ritual is performed before the roof is installed, and its purpose is to provide safety and protection to the owners of the building. To this end, an offering is placed at the roof ridge, consisting of a cross, a flag, and coca leaves. Unlike in La Paz, in Cochabamba only the first and third stages are performed, and they serve the same purposes (see Figure 6).

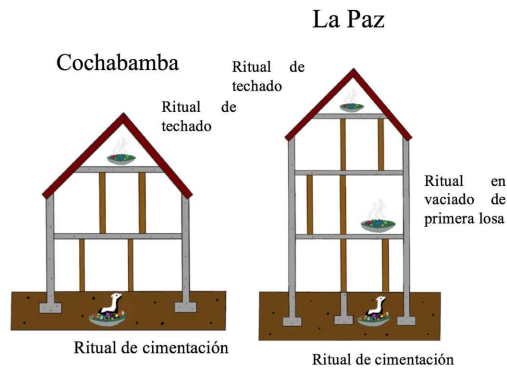


Figure 6. Stages of the construction process. Source: author's own work, 2022

Regarding the timing of the rituals, they are carried out according to the Andean calendar, which is organized around the solstices and equinoxes (see Figure 7). These rituals take place at four specific times, when the earth "opens its mouth," between August 2, November 1, 2, and 3, or February and May 2 and 3. The dates are related to planting and harvest times.

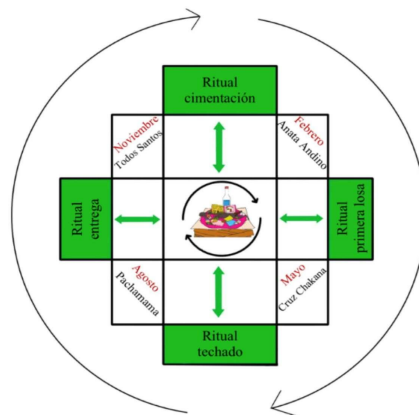


Figure 7. Ritual cycle of construction processes. Source: author's own work, 2022

Rituals in construction are of transcendental importance because it is believed that failing to perform them can lead to problems affecting the building's owners, the builders, and all those directly involved. According to the interviews, bad luck, accidents on the job site, difficulties, or the appearance of evil spirits are some of the issues that can arise during the construction process.

Among the rites, the akulliku stands out—an intermediate Andean ritual whose purpose on the job site is to foster collective work, harmony on the site, a connection with Pachamama, and strength for the day's work. It is performed three times a day: at the start of the work to greet and connect with the earth; at midday, when this practice serves to organize the work; and finally, at the end of the workday (see Figure 8).

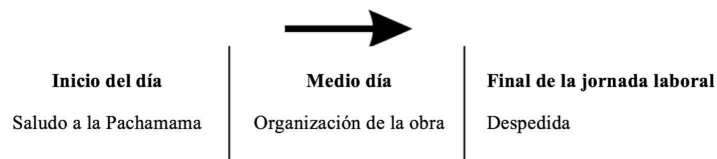


Figure 8. Moments of akulliku during the workday. Source: author's own work, 2022

The ritual tables consist of a series of elements used to please Pachamama. Prominent on the tables studied are alcohol, talismans, gold leaf, sweets, colored wool, myrrh, K'oa, copal, "Sullu" made of clay, and coca leaves (see Figure 2). Meat,

corn, quinoa, and potatoes are also present and represent abundance and prosperity. Beverages such as chicha and wine represent fertility and energy. Flowers represent beauty and harmony.

The ritual tables used in the construction contain at least eleven additional elements beyond those mentioned above (see Figure 9). They include bills and coins for financial prosperity, a walnut for wealth and good fortune, a sugar-made couple made of sugar symbolizing complementarity, figures representing the construction business, Andean guardian beings such as mountains representing Pachamama, miniature adobe bricks and bricks symbolizing the act of building, figures of joined hands suggesting unity and complementarity, a figure of a large house representing the home as the family nucleus, a figure of a kneeling couple representing fertility, construction machinery (dump trucks, mixers, and others) intended to ensure the construction process, among other details.

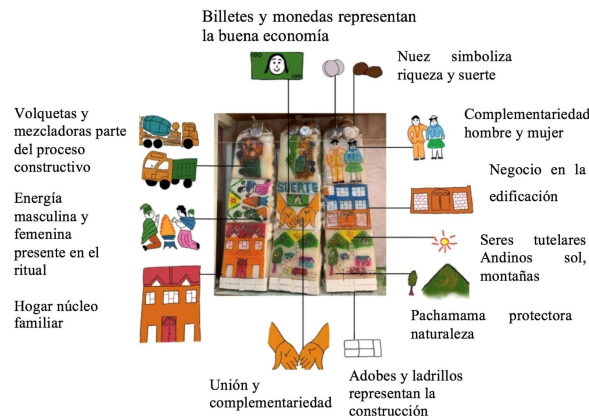


Figure 9. Elements of the ritual table for construction. Source: author's own work, 2022

During the ritual, these offerings are typically arranged spatially in two ways: a) The ceremony takes place in any corner of one of the building's important spaces, and the offering is buried in one of the corners; b) The ritual and burial of the main offering (Sullu) take place in the center of one of the building's most important spaces, while the burial of the food and ashes occurs at the four corners (see Figure 10). Beyond these two forms, it has been confirmed that, depending on who performs the ritual, these two forms may be modified.

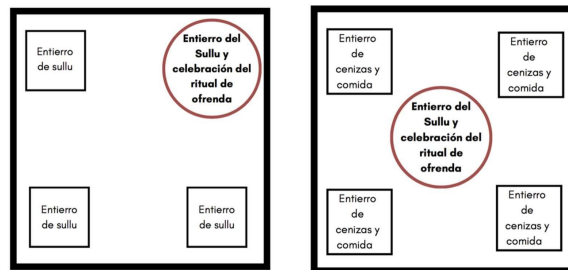


Figure 10. Spatial distribution of the rite and the offerings. Source: author's own work, 2022

Those who perform the rites are confident that through these offerings, the construction will be completed successfully, business will prosper, the owners' health will remain good, studies will be successful, the practitioners will be protected from evil spirits, and the offerings will be rewarded as long as the worship and gratitude toward Pachamama remain constant.

4.2 Ritual differences between La Paz and Cochabamba

According to the analysis of these practices, two facts characterize these rites:

- The building under construction becomes a subject through its humanization. This is achieved through a series of rituals performed during its construction and also while living in it, via rites (annual Ch'allas) intended to maintain its connection with the earth. The central idea is that the building is part of the earth and must be cared for.
- The building is also part of the living Pachamama. The rituals are an expression of gratitude for allowing the construction to proceed and for enabling work on its surface without any problems.

Regarding the differences in the rites practiced in the two cities, these can be divided into three categories: the purposes, their components, their participants, and the timing of the rites. Table 1 illustrates these differences.

Table 1. Ritual characteristics between Cochabamba and La Paz

Ritual Features	Cochabamba	La Paz
Purposes	The search for balance with the Pachamama due to the effects of construction on her surface.	The search for balance with the Pachamama is complementary to the search for health, success, business, etc.
Types of ritual offering tables	A single type, composed of the specified elements. The size of the mesa (ritual offering) and the offerings, as well as the variety of its components, varies depending on the size of the building and the social group that manages them.	Several types of offerings (literally 'tables') distinguished by their purposes: white tables, lightning tables, and glory tables. The size depends on the reading that the Yatiri makes of the context in dialogue with the achachilas, and what, in their judgment, Pachamama needs or requests. They may vary depending on the type and social group that participates. Also notable in this city are the Camiris or new rich Aymara people who, in the rituals, try to stand out by investing large sums of money.
Participants	Those who work on the construction participate: bricklayers, engineers, architects. The owners and, in some cases, the future inhabitants may also participate.	Those who work on the construction participate: bricklayers, engineers, architects. The owners and, in some cases, the future inhabitants may also participate.
Timing	The times vary and involve periods ranging from 2 hours to several days, depending on the size/scale of the building.	The duration of rituals can reach long periods, depending on the context read or determined by the Yatiri.
Ritual and impact on construction	In the planning and management of construction works, the hours allocated to rituals are not usually taken into account.	

Source: author's own work, 2022

Apparently, it can be concluded that the differences between the two cities are not very significant. In Cochabamba and La Paz, construction-related rituals seek balance with Pachamama, although in La Paz they are also oriented toward health, success, and business. In Cochabamba, a single type of table is used with specific elements, the size and variety of which vary depending on the scale of the construction project and the social group involved. In La Paz, there are several types of tables (white, lightning, glory), whose size and contents depend on the Yatiri's interpretation and interaction with the achachilas, adapting to the context and social group, with notable participation from the camiris—newly wealthy Aymara—who invest heavily in the rituals. In both cities, masons, engineers, architects, owners, and, in some cases, future residents participate. The duration of the rites in Cochabamba varies between 2 hours and several days depending on the construction project, while in La Paz, the duration is determined by the Yatiri and may be longer. In Cochabamba, the time dedicated to the rites is not typically factored into construction planning, whereas in La Paz, planning appears to be more flexible due to the Yatiri's crucial role.

A comparison between Cochabamba and La Paz reveals significant variations in the practice and complexity of construction rituals, reflecting the cultural, social, and economic differences of each city. In Cochabamba, standardization

and less consideration in planning suggest a coexistence with the modern demands of construction. In contrast, La Paz shows a deeper integration of rituality into daily life and project management, with greater flexibility and adaptability to specific circumstances.

Both contexts demonstrate how construction rites are more than mere ceremonies: they are deeply symbolic practices that mediate the relationship between humans and nature, reinforce community identity, and reflect social and economic structures. These rites encapsulate the resilience and adaptation of traditional practices in the face of the challenges and changes of modernity.

4.3 The value of rituals in construction processes

From a specialized construction perspective, Andean rituals integrated into construction processes are a cultural manifestation that, while not directly influencing the technical aspects of construction, fulfill essential symbolic and social functions. For practitioners, these rituals serve a protective purpose and aim to harmonize with nature, mitigating bad energies and negative spirits that may affect both people and buildings. This practice reflects a holistic view of the environment, where the desecration of the land requires rebalancing through offerings and ceremonies.

Interviews with builders reveal that these rituals do not significantly alter the technical construction process. They are not associated with the definition of specific technical processes, the inclusion of technical elements or additional materials, nor do they require a considerable amount of financial resources. Estimates indicate that the cost of these ritual practices represents only between 1% and 2% of a construction project's total budget. This data underscores that, from a budgetary perspective, the practice of these rituals has a minimal financial impact, although their cultural and symbolic value is immense.

In light of this information, one can reflect on the coexistence of traditional practices with the demands of modernity in construction. In Cochabamba, although the time allocated to rituals is not factored into construction planning, their observance demonstrates respect for cultural traditions and a symbolic integration that strengthens community cohesion. In La Paz, the greater flexibility and adaptability of the rituals—determined by the Yatiri and tailored to different contexts and social groups—suggest a deeper and more complex interaction between traditional practices and modern construction demands.

Finally, the financial investment in these rituals, though minimal, can be seen as an investment in social and environmental harmony, crucial for the long-term sustainability of the buildings and the well-being of the construction teams. The combination of modern construction practices with traditional rituals can create a more inclusive model that respects cultural diversity, enriching both the construction processes and social relationships within the teams of builders and owners.

5 Conclusion

Research on the integration of Andean rituals into construction processes in the cities of La Paz and Cochabamba reveals a profound interaction between traditional cultural practices and modern construction demands. These rituals are not only essential for practitioners but also represent a crucial symbolic and social manifestation within these communities. Architecture and construction, together with rituals, have been intrinsically linked since ancient times, with buildings serving not only as a reflection of a society's beliefs and values but also as spaces where rituals come to life and acquire meaning. Offerings to Mother Earth during the construction of infrastructure in Andean cities represent an act of reconciliation between humans and nature.

The results of the research on the integration of Andean rituals into construction processes in La Paz and Cochabamba reaffirm the deep relationship between architecture and rituals, reflecting how these traditional practices adapt and coexist

with modern demands despite the influence of Western construction models.

In the context studied, the rites in question are based on the belief that Pachamama is a living being who must be respected. Any intervention on her surface must be carried out with her permission and blessing, without forgetting to express gratitude. This principle is consistent with the observations expressed in the theoretical section, which highlights how architectural structures, from the Egyptian pyramids to Gothic churches, were designed to facilitate and frame ritual activities.

The rituals studied, although they do not significantly impact the technical aspects of construction and most builders report that these practices only require incorporating small elements that facilitate the rites or modifying schedules based on special dates, generally do not demand a considerable amount of financial resources. Their main impact is cultural and symbolic because it creates a kind of "double architecture" or two infrastructures. The physical infrastructure is accompanied by a symbolic and spiritual infrastructure [24] that provides protection, harmony, and social cohesion, strengthening community identity and reinforcing social relationships. García [14] argues that rituals strengthen the sense of belonging in the community and allow for a more effective organization of group life, because social and economic pressures can fragment the community [25].

A comparison between La Paz and Cochabamba reveals significant differences in the complexity and flexibility of the rites. In La Paz, the rites are more elaborate and adaptable, determined by the Yatiri and in interaction with the achachilas, while in Cochabamba, greater standardization is observed with a more uniform approach. These results reflect the adaptability of ritual practices to regional cultural and socioeconomic variations, aligning with the theory that rituals adapt to the specific circumstances of each community, as suggested by Fernández [15] in his study on rituals in Quechua and Aymara culture. However, in both cases, the rituals for laying the foundation, constructing the intermediate floor slabs, and roofing align with the key stages of the construction process, functioning as acts of reconciliation, gratitude, and balance with the earth.

In short, these rituals reflect a continuity and adaptation of traditional practices in a modern context. They are not only essential for the practitioners but also represent a crucial symbolic and social manifestation in the social relationships surrounding construction. The research demonstrates how these rituals reinforce local identity, promote social cohesion, and facilitate a harmonious coexistence between modernity and tradition, underscoring the importance of respecting and keeping cultural practices alive. Through these rites, buildings—viewed as mere spaces for residential or economic activity—are redefined as sacred and living places that celebrate their "life" at different times of the year (Carnivals and K'oas). In summary, it can be said that these acts change the perception of Andean cities.

Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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