

**Counter-hegemonic housing constructs for sustainable urbanism and  
urban resilience in the 21st century**

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## SUMMARY

In the face of the multiple environmental and social crises largely caused by the predatory behavior of human beings in their habitat, the main challenge that the human species must deal with is to build and nurture sustainable human communities so that their ways of inhabiting do not interfere with nature's inherent ability to sustain life. This study aimed to elucidate counter-hegemonic contemporary housing constructs experienced in Intentional Communities (IC) that demonstrate ecological awareness in their ways of inhabiting. For this purpose, three case studies were selected that present international relevance in their ways of life by proposing ways of inhabiting that are alternative to mainstream society and configure different scenarios of project implementation and scale, such as Findhorn in Scotland, Auroville in India, and Christie Walk in Australia. The discussion sought to highlight similarities and differences in the ways of inhabiting experienced in each IC analyzed, besides proposing a correlation with ecological principles to emphasize the potential of such constructs for the resilience and sustainability of contemporary urban habitat. The results of this paper contribute to studies that propose a new epistemological approach to architecture from a systemic perspective, especially to studies dedicated to IC settlements whose underlying intention is to promote the equilibrium of the human in his habitat.

**KEYWORDS:** Housing. Sustainability. Resilience.

## 1 INTRODUCTION

In the face of the multiple environmental and social crises largely caused by the predatory behavior of human beings in their habitat, the main challenge that the human species must deal with according to Capra and Luisi (2014), is to build and nurture sustainable human communities so that their ways of inhabiting do not interfere with nature's inherent ability to sustain life. The global ecological crisis seems to constitute the early stages of the collapse of our civilization, and cities are one of the main agents of environmental degradation. Although cities occupy less than 2% of the earth's surface, they are responsible for about 75% of the world's energy consumption and more than 70% of global emissions. Approximately 4.5 billion people live in cities, and by 2050 this number may double, which means that by the mid-century more than 1.6 billion people will be living in cities (ONU, 2021). For Alberti (2009), cities and urbanized regions are coupled human-natural complex systems in which people are the dominant agents. As humans transform natural landscapes into highly human-dominated environments, a new set of ecological conditions that modify ecosystem processes and dynamics is created. The effects of urbanization are quite noticeable and expose the unbalanced picture of the planet with intense heat waves, prolonged droughts, water crises, forest fires, floods and storms, hillside landslides, and rising sea levels, among other environmental disasters that sound like a global warning and configure the hallmark of the Anthropocene<sup>1</sup>. In cities, the destruction of the natural habitat for the construction of urban space is motivated by the productive forces of the capital that configures territories based on political interests and on the

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<sup>1</sup> A concept under discussion that designates a new geological era of Planet Earth in which anthropic actions constituted such a powerful force in nature that they surpassed its capacity for regeneration. The term was launched in the 1980s by Eugene F. Stoermer, an American biologist, and became popular in the 2000s with the publications of the Dutch atmospheric scientist Paul J. Crutzen, winner of the 1995 Nobel Prize in Chemistry, who found deep alterations in the composition of the atmosphere with the accumulation of greenhouse gas. Many scholars have associated the beginning of this new era with the Industrial and Energy Revolution in Europe when James Watt patented a steam engine in 1769; others prefer the Post World War II time frame that started the process of the great acceleration, around 1945 when the availability of oil and the diffusion of technologies provoked a boom in mass energy consumption (ALVES, 2022).

market to make the most profit. This panorama also characterizes the background of mainstream society, guided by the neoliberal logic of space production where the State acts to regulate the market actions and interests, and the principal output of such cooperation is a trail of human destruction, both in the shacks and slums of the world, and in the environments where people are dispossessed for reasons of class, gender, race, nationality or for belonging to an indigenous people (SMITH, 2017).

In the context of the 2030 Agenda for Sustainable Development, the Paris Agreement, and other global development agreements, the New Urban Agenda - an action-oriented document approved at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, Ecuador, 2016, that signals the commitment of the governments to resilient and environmentally sustainable urban development, particularly in relation to Goal 11 on Sustainable cities and communities (ONU, 2019) - presents the need to think of urbanization as a means to promote sustainable development, since the persistence of multiple forms of poverty, growing inequalities, and environmental degradation of the planet are irrefutable. In this sense, the document points to the implementation of inclusive and effective urban policies and legislation for sustainable urban development. So, the concept of resilience can be understood according to the definition provided by the Arctic Council and quoted in the 5th Assessment Report of the Intergovernmental Panel on Climate Change: "the capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation" (IPCC, 2014, p. 5).

As for the concept of urban sustainability, it should be assimilated through a symbiosis between social sustainability - which involves the human well-being achieved through indiscriminate access to provisioning, regulating, supporting, and cultural services - and environmental sustainability, which refers to the appropriate management of ecosystems (DEMANTOVA; RUTKOWSKI, 2007). In this paper, it is considered urgent to awaken ecological consciousness in humanity so that their ways of inhabiting do not interfere with the balance of life-sustaining processes in nature. This change involves new forms of perception that integrate biological, cognitive, and social dimensions of life and go beyond the Cartesian paradigm of classical science into the complexity of natural phenomena from a transdisciplinary perspective that seeks the advance of scientific knowledge based no longer on postulates but on uncertainties. This perception of reality is called by Capra (2002) the "systems view of life" according to the intellectual tradition of systems theory, and is based on the knowledge of Deep Ecology, which does not separate humans from nature and recognizes the intrinsic value of all living beings, expanding to the spiritual sphere that involves the sense of belonging to the cosmos. Such perspective provides an appropriate framework for the conceptual connection between ecological and human communities as both are living systems that exhibit common organizing principles. In this context, Capra and Luisi (2014) recognize the need for eco-literacy for humans to develop ecological consciousness in their ways of life.

We need to teach our children, our students, and our corporate and political leaders, the fundamental facts of life – that one species' waste is another species' food; that matter cycles continually through the web of life; that the

energy driving the ecological cycles flows from the sun; that diversity assures resilience; that life, from its beginning more than 3 billion years ago, did not take over the globe by combat but by networking (CAPRA; LUISI, 2014, p. 356).

This study hypothesizes that ecological awareness is demonstrated in human settlements that propose ways of inhabiting in connection with nature and human relations, such as the experiences of contemporary constructs of counter-hegemonic dwellings experienced in Intentional Communities (IC). The ICs are groups of people who deliberately decide to live together, motivated by a common life purpose, and are looking for better living conditions (KOZENY, 1995). Some authors recognize these settlements as legitimate forms of social movements that propose to build alternatives to the existing order (MILES, 2008; ERGAS, 2010), while others recognize them as models of societies that strive to explore possible utopian practices (SARGISSON, 2007; WILLIAMS, 2008). The historical relationship of these constructs has diverse origins and ideological inclinations, such as the search for self-sufficiency and spiritual development; the environmental, pacifist, feminist, and alternative education movements of the 1960s and 1970s; the back-to-the-land, cohousing, and ecovillage movements in affluent countries of the global north; movements that advocate participatory processes in underdeveloped countries of the global south; among others (DAWSON, 2015). The ways of inhabiting of these models are usually associated with bottom-up instead of top-down decisions, - e.g., the involvement of the inhabitants during the design process and then in the community management (DOWNTON, 2009) -, and rely on educational actions aimed at environmental awareness linked to Non-Governmental Organizations (NGOs), universities, research centers, etc. (DIAS et al., 2017). In this case, these constructs are identified in human settlements that fit as IC and present international relevance in their lifestyles by proposing ways of inhabiting that are alternative to those of mainstream society and configure different scenarios of project implementation and scale, such as: (1) Findhorn in Scotland, also known as the "mother of all ecovillages"; (2) Auroville in southern India, which presents itself as a universal city under construction for a population of up to 50.000 people; (3) and Christie Walk in Australia, which acknowledges itself as an Ecopolis experiment.

## **2 OBJECTIVES**

In order to contribute to transdisciplinary studies and discussions that support the development of the concept of resilience and urban sustainability in the panorama of the contemporary city in the area of knowledge of Architecture & Urbanism (AU), this study aims to elucidate contemporary counter-hegemonic housing constructs experienced in Intentional Communities (IC) that demonstrate ecological awareness in their ways of inhabiting.

## **3 METHODOLOGY**

The methodological strategy adopted was case studies of three counter-hegemonic contemporary housing constructs experienced in IC that demonstrate ecological awareness in

their ways of inhabiting: Findhorn in Scotland, Auroville in India, and Christie Walk in Australia. The methodological procedures are based on exploratory bibliographic research from primary sources (data available on homepages) and secondary sources (books and scientific articles).

The theoretical development attended themes that support the approach of case studies and corroborate the analysis and discussion of the results. It describes the evolution of scientific knowledge towards the non-linear, systems, and complexity theories with the contextualization of different moments and historical figures that support the systems view of life. Then, the principles of ecology proposed by Capra and Luisi (2014) are presented as guidelines for the construction of sustainable human communities based on the concepts of interdependence, cyclic nature, solar energy, partnership, flexibility, and diversity.

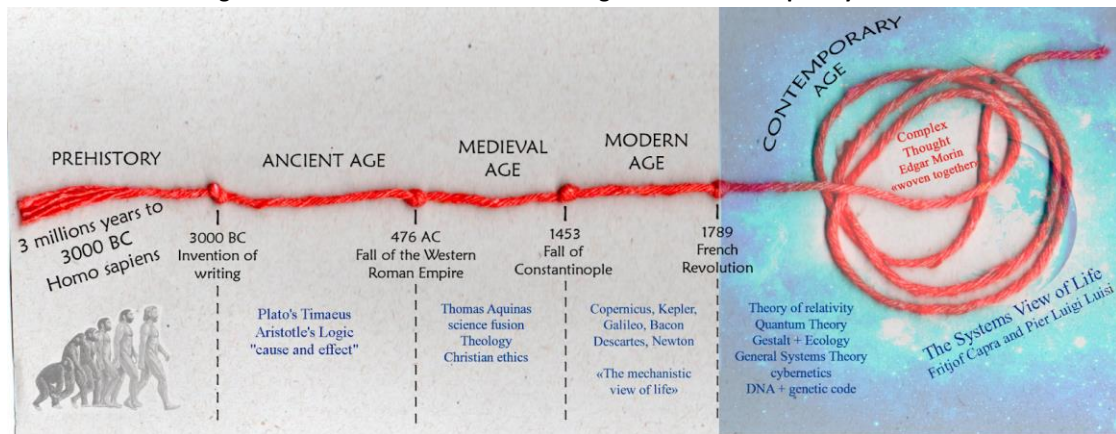
The results section presents the case studies of IC according to their historical formation, the vision and purpose of life of their inhabitants, and the description of their architectural designs with photographs that show the settlements in their actual aspects. The discussion sought to highlight similarities and differences in the ways of inhabiting experienced in each IC analyzed, besides proposing a correlation with ecological principles to highlight the potential of such constructs for the resilience and sustainability of contemporary urban habitat. This correlation was established in a very introductory approach, considering only the adherence of the ways of living in each settlement studied to the ecological principles according to a comprehensive interpretation of each concept in the area of knowledge of AU.

#### **4 CONTEXTUALIZATION OF THE SCIENTIFIC KNOWLEDGE EVOLUTION TOWARD THE COMPLEXITY OF LIFE**

The evolution of scientific knowledge is linked to provocative inquiries by human beings about the origin, nature, and meaning of life. For the ancient Greek philosophers, the world was an ordered structure in which all parts had the purpose of contributing to the harmonious functioning of the whole in nature, like in the analogy of Plato, fourth century B.C., in his *Timaeus* on macrocosm and microcosm. However, it was Aristotle who organized and systematized scientific knowledge, developing his logic called "Aristotelian Logic. In the Middle Ages, medieval philosophers used Aristotle's texts evaluating them on the base of Christian teachings as in the writings of Thomas Aquinas (1225-1274), who proposed the fusion of science with Christian theology and ethics. In the Early Modern Period, the achievements provided by the philosophical and literary movement of humanism, the Renaissance of the arts, and the geographical explorations of the Earth destabilized the medieval dogma based on Christian teachings. The rediscovery and translation of classical texts from antiquity into Latin encouraged the critical thinking of individual scholars and artists such as Leonardo da Vinci (1452-1519), who developed an empirical approach based on systematic observations of nature. Later, in the 16th and 17th centuries, rationality was accentuated in a period known as the Scientific Revolution, which favored the rise of a new paradigm in science with the studies of Nicolaus Copernicus (1473-1543), Johannes Kepler (1571-1630), Galileo Galilei (1564-1642), Francis Bacon (1561-1626), and especially René Descartes (1596-1650) who proposed the mechanistic view of life with the

understanding that everything in nature works like the gears of a machine. After Descartes, Isaac Newton (1642-1727) made a great synthesis of his predecessors' works, developing a method that described and explained the movements of bodies under the influence of gravity. The advance of science in the first decades of the twentieth century with Albert Einstein's theory of relativity (1879-1955), the quantum theory formulated by a team of physicists under the leadership of Niels Bohr (1885-1962), and the postulates about the chaos and disorder invalidated the proposition of universal laws as previously accepted in the Cartesian paradigm. This stage sees the development of a new focus in science, the systemic focus, which presents a holistic apprehension of reality. The roots of systemic thinking were thus built from the theories of organismic biologists, Gestalt psychologists, and ecologists who formulated most of the systemic concepts that comprise the organizational principles of living systems and include the General Systems Theory developed by the biologist Ludwig von Bertalanffy (1901-1972), in addition to Cybernetics which relied on the multidisciplinary collaboration of mathematicians, neuroscientists, social scientists, and engineers. Between the 1950s and 1970s, the achievements of genetics with the elucidation of the molecular structure of DNA and the genetic code, and the formulation of the complexity theory with the resolution of non-linear equations corresponding to the characteristics of living systems triggered a new revolution in science (CAPRA; LUISI, 2014; GRZYBOWSKI, 2011). In contemporary times, we highlight the theoretical production of the French sociologist Edgar Morin (2011), which postulates the need for a systemic approach to a "complexus" thinking (a Latin word which means what is woven by several people together) so that there is an articulation between the different branches of science, and that of Fritjof Capra (physicist and systems theorist and one of the founders of the Center for Ecoliteracy in Berkeley, California) and Pier Luigi Luisi (professor of biochemistry at the University of Rome) who advocate the need for a systems view of life with the integration of biological, cognitive, social and ecological dimensions based on Deep Ecology. This philosophical school was founded in the early 1970s by the Norwegian philosopher Arne Næss (1912-2009), which places human beings on the same level as other living beings in the "web of life", constituting a vast network of relationships between animals, plants, and microorganisms in nature. In summary, these authors (MORIN, 2011; CAPRA; LUISI, 2014) envision the need for transdisciplinary research and networking in science to advance scientific knowledge on a non-linear path. To summarize the evolution of scientific knowledge, we drew up a chronological line that marks some of the principal theories and most-known authors in the history of western civilization (Figure 1).

**Figure 1: Evolution of scientific knowledge toward the complexity of life**



Source: AUTHORS, 2023.

#### 4.1 ECOLOGICAL PRINCIPLES FOR THE CONSTRUCTION OF HUMAN SUSTAINABLE COMMUNITIES

The science of Ecology began with the naturalist tradition at the end of the 19th century, and its key concepts were developed during the 1920s and 1930s in conjunction with other areas of knowledge, such as the interdisciplinary studies of organismic biologists, Gestalt psychologists, and the systems thinkers of the period. For Capra and Luisi (2014), the science of Ecology is extremely important to assess and influence the future of humanity, and they believe that ecological literacy is the only operational path to sustainability. Therefore, they point out a set of ecological principles as guidelines for the construction of sustainable human communities:

- (1) interdependence: refers to the network of relationships of mutual dependence between all living beings in the process of life, thus it is inferred that the success of the whole community depends on the success of its individual members, while the success of each member depends on the success of the community as a whole.
- (2) cyclical nature: all organisms in an ecosystem produce wastes, but what is waste for one species is food for another.
- (3) solar energy: the only kind of energy that is renewable, economically efficient and environmentally benign. It is the primary source of energy driving the ecological cycles.
- (4) partnership: networking through generalized partnerships in nature. "Sustainability is not an individual property but a property of an entire web of relationships. It always involves a whole community. This is a profound lesson we need to learn from nature" (Ibidem, p. 355).
- (5) flexibility: a consequence of its multiple feedback loops which tend to bring the system back into balance whenever there is a deviation from the norm due to changing environmental conditions. "The web of life is a flexible, ever-fluctuating network. The

more variables are kept fluctuating, the more dynamic is the system, the greater is its flexibility, and the greater is its ability to adapt to changing conditions” (Ibidem, p. 355).

(6) diversity: connected to the system’s network structure. The more complex it is, the richer is its pattern of interconnections and the more resilient it will be. “Diversity means many different relationships, many different approaches to the same problem. A diverse community is a resilient community, capable of adapting to changing situations” (Ibidem, p. 356).

## **5 COUNTER-HEGEMONIC CONTEMPORARY HOUSING CONSTRUCTS**

Next, we elucidate the case studies of counter-hegemonic contemporary housing constructs, whose ways of inhabiting demonstrate ecological awareness, each with a different implementation scenario and project scale: Findhorn in Scotland, Auroville in India, and Christie Walk in Australia.

### **5.1 FINDHORN**

The early idea of the Findhorn Ecovillage emerged in 1962 with the initiative of Peter and Eileen Caddy, with their three children and their friend Dorothy Maclean, to occupy an area that previously housed a caravan park on the northeast coast of Scotland. At the time, Peter was unemployed, and to support them, he decided to grow vegetables although the local soil conditions were not appropriate for agricultural practice. Dorothy, through her meditation practices, discovered that it was possible to intuitively access the intelligence of plants. And, with a lot of dedication, she and Peter were able to improve the soil conditions and make it productive. This work made the community known and attracted people motivated to develop spirituality in connection with nature. In the 1970s and 1980s, the inhabitants of the community bought the lands in the region, founding the Findhorn Foundation (formally registered as a Scottish charity), and started the Ecovillage project. In the 1990s, the community and a network of informal ecovillages organized themselves at a conference in Findhorn, the Ecovillages and Sustainable Communities for the 21st Century, founding an international network of intentional communities called the Global Ecovillage Network (GEN). Over the years, the community has developed an ecologically correct and energy-efficient building system with renewable sources and local and recycled materials, publishing an orientation guide for ecological projects and constructions. Among the recommended design and construction techniques are simple timber frame construction and detailing; openings according to solar orientation; shared facilities (laundry, kitchens, living lounges) to avoid unnecessary duplication of rooms; use of solar panels for domestic hot water heating; rainwater collection and recycling for use in gardens; installation of low-energy light bulbs; cellulose heat insulation of seals (made from recycled paper); organic paints, glues, and non-toxic resins; locally grown and harvested timber from managed forests; roofing with natural clay tiles; “breathing wall” that allows air and vapor exchange with the external environment; suspended timber floors for underfloor air circulation to avoid any



possible build-up of radon gas; among other energy and water saving devices (FINDHORN ECOVILLAGE, 2021).

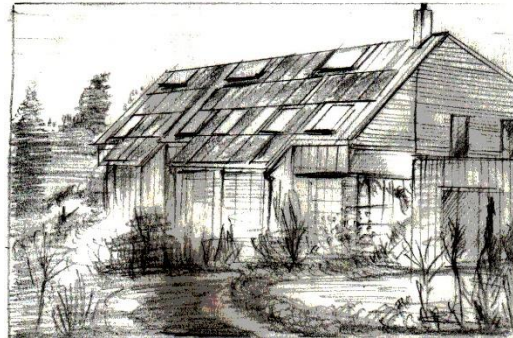
In Findhorn, the inhabitants live values and spiritual principles through daily actions that seek to build positive environments in the community, such as “work is love in action”, “inner listening”, “co-creation with the intelligence of nature”. The purpose of life developed in Findhorn considers that the involvement of its members provides the necessary spiritual and social structure to experience new ways of being. They believe that community life combined with practices of spiritual values provides a transforming environment where learning occurs naturally in the daily life of families. “We work through conflicts, we celebrate seasonal rhythms, we eat, work and have fun together, we recognize life’s hallmarks, and we explore new forms of leadership, economy, and governance.” (FINDHORN FOUNDATION, 2021, online). The community’s projects follow strict parameters of ecological construction with zero carbon emissions. The community has 90 ecological buildings, including adaptation of existing ones in response to climate changes (Figures 2 and 3) (FINDHORN ECOVILLAGE, 2021).

**Figure 2: Ecological buildings in Findhorn**



Source: Redrawing developed by the AUTHORS (2023) from the photograph available at the link: <https://www.ecovillagefindhorn.com/index.php/building>

**Figure 3: Buildings with solar panels installed**



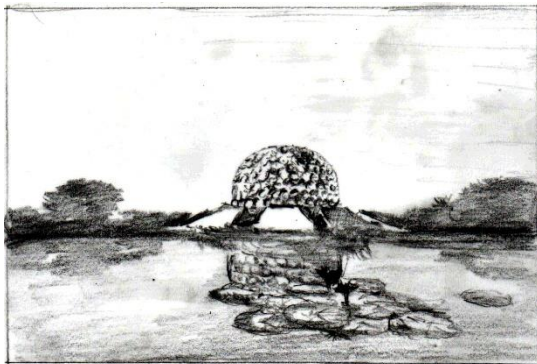
Source: Redrawing developed by the AUTHORS (2023) from the photograph available at the link: <https://www.ecovillagefindhorn.com/index.php/renewable>

## 5.2 AUROVILLE

The universal township Auroville, under construction for up to 50,000 people, takes its name from the French language, in which “Aurore” means dawn and “Ville” means city. It was founded by the spiritual leader Mirra Alfassa (1878 - 1973) – also known as “the mother” –, who already in the 1930s cultivated the idea of building a society guided by the teachings of Sri Aurobindo but the plan was developed and submitted to the Indian government only in the 1960s; it was approved by the General Assembly of the United Nations Educational, Scientific and Cultural Organization (UNESCO), recommended as a project of importance for the future of humanity. On February 28, 1968, some 5,000 people gathered in the center of the future city for an inauguration ceremony attended by representatives of 124 nations, including all states of India. They brought a handful of their native soil to be mixed into a lotus-shaped urn, which is now located at the center of the Amphitheater. At that moment, Mirra Alfassa handed over a handwritten charter, the Auroville Charter, which presents the four points that guide life in the

community. The Auroville project's purpose is to be a universal and experimental township where men and women from all countries can live in peace and progressive harmony, above differences of creed, politics, and nationality. For this, the worldview in this community follows the four points of the Charter written by the spiritual leader Mirra Alfassa (AUROVILLE, 2021). Auroville's project is that of an experimental city dedicated to the pursuit of human unity, located in southern India, mainly in Tamil Nadu with some parts in Puducherry, a few kilometers from the Coromandel coast. The city's urban plan is organized in six zones: (1) International: on 158 acres, with national and cultural pavilions grouped by continent; (2) Residential: on 432 acres, with 45% of its surface occupied and 55% of green spaces; (3) Industrial: on 266 acres, it concentrates small and medium green industries, and the Head Office of the Auroville administration; (4) Cultural: on 241 acres, with has facilities dedicated to cultural, educational and sports activities; (5) Green: green belt 1.25 km in diameter with agricultural land dedicated to the production of organic food and dairy products, plus a forest that is home to local wildlife; (6) Peace: in the center of the city is located the Matrimandir Temple (Figure 4), a large golden sphere that symbolizes the birth of a new consciousness, designed by the French architect Roger Anger (LANDS FOR AUROVILLE UNIFIED, 2022).

**Figure 4: Matrimandir Temple in Auroville**



Source: Redrawing developed by the AUTHORS (2023) from the photograph available at the link: <https://auroville.org/page/visit-Matrimandir>

**Figure 5: Ecological building: Earth Institute**



Source: Redrawing developed by the AUTHORS (2023) from the photograph available at the link: [https://www.earth-auroville.com/about\\_us\\_en.php](https://www.earth-auroville.com/about_us_en.php)

There is also a great focus on environment in Auroville. Before the implantation of the city project, the lands of its site were in a process of erosion. The first activities undertaken to make the land habitable were natural techniques with low cost and environmental impact, such as the ecological buildings and renewable energy sources (Figure 5) (AKKER; LIPP, 2004). Currently, there are approximately 3,273 people of 59 different nationalities living in Auroville with the purpose of building a universal city where men and women from different nationalities can live in a climate a peace and progressive harmony (AUROVILLE, 2021).

### 5.3 CHRISTIE WALK

The Christie Walk community presents itself as an experimental model of Ecopolis, and its name is due to the memory of an environmental activist, Scott Christie. The community was founded by Urban Ecology Australia (UEA) - a non-profit community educational association

created in 1991 by Paul Downton (architect, writer, and independent researcher), Cherie Hoyle (community manager), and Emilis Prelgauskas (architect) -, that undertakes to promote environmental awareness taking Christie Walk as an example. To live in this community, the inhabitants follow ten principles that guide the development of an Ecopolis (Table 1), which seek to repair and restore the biological processes that sustain life in nature (URBAN ECOLOGY, 2021).

**Table 1: Principles for the development of an Ecopolis**

Principles	Description
Restore degraded land	Use urban development to restore the health and vitality of the land. Rehabilitate and maximize the ecological health and potential of land as a consequence of the development of human settlement.
Fit the bioregion	Create human settlements which work with the natural cycles of the region. Conform to the parameters of the bioregion, fit the landscape with the patterns of development which follow the inherent form and limitations of the land, understood in socio-biophysical terms.
Balance development	Balance development with the "carrying capacity" of the land. Balance the intensity of development against the ecological carrying capacity of the land whilst protecting all viable existing ecological features. Develop and enhance links between urban and rural areas of an integrated city-region approach.
Create compact cities	Reverse sprawl and stop ad-hoc development from consuming the landscape. Develop human habitation at a relatively high density within inviolable green belts of natural or restored ecologically viable landscapes with the overall development density constrained by ecological limits.
Optimize energy performance	Generate and use energy efficiently. Operate at low levels of energy consumption, using renewable energy resources, local energy production, and techniques of resource reuse. All ecological development should seek to be energy self-sufficient. The primary energy base for development should come from renewable sources.
Contribute to the economy	Create work opportunities and promote economic activity. Support and develop ecologically and socially responsible economic activity. Materials and component manufacture should be derived from or be located in the local bioregion to the maximum practicable extent.
Provide health and security	Create healthy and safe environments for all people. Employ appropriate materials and spatial organization to create safe and healthy places for people to live, work and play in the context of an ecologically resilient environment.
Encourage community	Cities are for everyone. Create cities with strong citizen involvement - community participation, not just consultation. The community should govern itself. Community needs must drive ecological development. Ecological development must meet community requirements, including the community of life that is the eco-system.
Promote social justice and equity	Equal rights and access to services, facilities, and information. Employ economic and management structures which embody principles of social justice and equity. Ensure equal rights and access to essential services, facilities, and information. Alleviate poverty and create work opportunities.
Enrich history and culture	Respecting the past whilst looking to the future. Maximize the value of previous worthwhile human endeavor in terms of both heritage and manufactured artefacts. Support and promote cultural diversity, incorporating ecological awareness into all aspects of the making and maintenance of human settlement.

Source: <https://www.urbanecology.org.au/eco-cities/what-is-an-ecocity/>

The community is located in the city center of Adelaide, Australia. There are 27 housing units on a lot of 2,000 m<sup>2</sup>. The design process for Christie Walk began in 1999 and was completed in 2006, with the participation of future inhabitants and was coordinated by the lead architect of the project Paul Downton. The needs program presents different housing typologies (Figure 6): four detached single-story residences, a two-story building with four semi-detached houses, a three-story building with six apartments, and a five-story building with thirteen apartments. In addition to the housing units, the project presents a "common house" that includes a

collective kitchen, laundry, toilets, a meeting room, car parking, and the UEA headquarters. The architecture of this community is characterized by passageways and gardens with planting of native and low-maintenance species between the buildings that are open to the local community, allowing pedestrians to enjoy the interior of the site (Figure 7). The construction systems adopted in Christie Walk were plantation wood pillars and beams, aerated concrete slabs, straw bale walls (biodegradable material with good thermal and acoustic characteristics), and reused wood frames. Other materials used, like bricks, stone, steel, and wood, were recovered from a few pre-existing structures on the site that were demolished. The construction of the buildings met environmental performance criteria for the efficient use of the building, such as rainwater collectors and cisterns, photovoltaic solar panels, low-energy lamps, openings with adequate solar orientation, use of recycled materials, and planting of native species in low-maintenance gardens (URBAN ECOLOGY, 2021).

**Figure 6: Different types of housing in Christie Walk**



Source: Redrawing developed by the AUTHORS (2023) from the photograph available at the link: <https://www.urbanecology.org.au/site-tour-gallery/>

**Figure 7: Paths and gardens open to the city that create the atmosphere of an urban oasis**



Source: Redrawing developed by the AUTHORS (2023) from the photograph available at the link: <https://www.urbanecology.org.au/site-tour-gallery/>

## **6 CONSTRUCTS' POTENTIALITIES: SIMILARITIES AND DIFFERENCES IN THE WAYS OF LIVING AND THEIR CORRELATION TO THE ECOLOGICAL PRINCIPLES**

Based on the analysis parameters considered, it was possible to identify similarities and differences in the experiences of the housing constructs in Findhorn, Auroville, and Christie Walk, which demonstrate ecological awareness in their ways of inhabiting. The similarities occurred in the search for connections in human relationships (cooperation and interdependence in community life), contact with nature (projects aligned to the physical-geographical characteristics of the place of establishment; construction of the buildings using natural materials, recycled and renewable energy sources), and everyday practices focused on the development of spirituality as a state of consciousness. On the other hand, differences were identified in the different degrees of proximity and isolation of the communities in relation to mainstream society, the scales of project implementation, the geographic location, and the principles and values that guide the lives of their inhabitants. In each community, we analyze: (1) Findhorn in Scotland: aims to achieve self-sufficiency with ecological buildings, generation of

local energy from renewable sources, and spiritual development of its inhabitants through everyday practices that guide the harmony of human connections and contact with nature. (2) Auroville in India features a larger-scale physical project structure and a pronounced utopian profile in its ways of inhabiting, aiming at the spiritual expansion of its inhabitants. In this universal and experimental township, men and women from all countries aim to live in peace and progressive harmony, above differences of creed, politics, and nationality. (3) Christie Walk in Australia: the experiment of an Ecopolis project that searches the dialogue with the city and stands out for the protagonism and urban activism of its flexible proposal that seeks to make mainstream society aware that it is possible to transform conventional urban spaces into economically viable and socially sustainable ecological environments.

Table 2 below presents the correlation of the ecological principles proposed by Capra and Luisi (2014) as guidelines for building sustainable human communities with adherence to the ways of living in the housing constructs studied. Such principles show potential to be used as design parameters in other studies based on systemic analysis of architectural design with the convergence of authors from area of knowledge of AU.

**Table 2: Adherence of the housing constructs studied to the ecological principles**

Constructs	Ecological Principles					
	Interdependence	Cyclic Nature	Solar Energy	Partnership	Flexibility	Diversity
Findhorn	**	**	**	**	*	**
Auroville	**	**	**	**	*	**
Christie Walk	**	**	**	**	**	**
Subtitle ** Total adherence * Partial adherence - Zero adherence						

Source: AUTHORS, 2022.

## 7 CONCLUSION

According to the study's aim to elucidate contemporary counter-hegemonic housing constructs experienced in IC that demonstrate ecological awareness in their ways of inhabiting, three case studies of IC were selected that present international relevance in their lifestyles by proposing ways of inhabiting that are alternative to those of the mainstream society and configuring different scenarios of implementation and project scale, such as Findhorn in Scotland, Auroville in India, and Christie Walk in Australia.

The methodological procedures were based on bibliographic research with exploratory nature and theoretical development that contextualizes the evolution of scientific knowledge towards nonlinear, systems and complexity theories, which underlie the systems view of life and the ecological principles pointed out by Capra and Luisi (2014) as guidelines to build sustainable human communities based on the concepts of interdependence, cyclic nature, solar energy, cooperation, flexibility, and diversity. Then we dealt with the analysis of such constructs according to the historical formation of the communities, the vision and purpose of life of their inhabitants, and the description of their architectural designs with photographs that present these settlements in their actual aspects.

The discussion points out similarities and differences in the ways of inhabiting of the constructs and the correlation with the ecological principles that present potential to be used in other studies that seek the systemic analysis of architectural projects. Therefore, the hypothesis that ecological awareness is demonstrated in human settlements that propose ways of inhabiting in connection with nature and human relations, such as the IC's experiences, could be confirmed. (1) Findhorn in Scotland: aims to achieve self-sufficiency with ecological buildings, generation of local energy from renewable sources, and spiritual development of its inhabitants through everyday practices that guide the harmony of human connections and contact with nature. (2) Auroville in India features a larger-scale physical project structure and a pronounced utopian profile in its ways of inhabiting that aim at the spiritual expansion of its inhabitants. In this universal and experimental township, men and women from all countries aim to live in peace and progressive harmony, above differences of creed, politics, and nationality. (3) Christie Walk in Australia: the experiment of an Ecopolis project that searches the dialogue with the city and stands out for the protagonism and urban activism in the flexible proposal of its project that seeks to make mainstream society aware that it is possible to transform conventional urban spaces into economically viable and socially sustainable ecological environments.

The study concluded that such constructs of contemporary housings fit as a type of counter-hegemonic architecture that organizes itself from “bottom-up” decisions rather than “top-down”, through participatory processes that foster spontaneous community life and the connections between human beings and nature at different degrees of proximity (geographical location, building systems, principles and values of life in human settlements, etc.), that point different paths to promote a sustainable urbanism and urban resilience in the 21st century. The results of this paper contribute to studies that propose a new epistemological approach to architecture from a systemic perspective, especially to studies dedicated to IC settlements that have the underlying intention to promote the balance of human beings in their habitat.

#### **ACKNOWLEDGEMENT**

We thank the Coordination for the Improvement of Higher Education Personnel (CAPES) for the doctoral research aid.

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