

Entrepreneurship Ecosystems: The Gardener Metaphor

Viviana Molina-Osorio

Universidad Católica Luis Amigó - OKA Consultores Academicos, Colombia

viviana.molinaos@amigo.edu.co

Abstract: This paper proposes a novel framework for understanding entrepreneurship ecosystems (EEs) through the gardener metaphor, integrating complexity theory, distributed leadership, and institutional design. Drawing on empirical insights from Manizales Más in Colombia and grounded in a design-driven, hermeneutic methodology, the metaphor reimagines EEs as dynamic, cultivated environments requiring strategic vision, adaptive care, and collaborative effort. Key components of EEs—markets, culture, human capital, public policy—are mapped onto garden elements like plants, soil, pollinators, and fertilizers. The gardener becomes a symbol of ecosystem leadership, moving beyond individualistic or laissez-faire approaches to emphasize stewardship, design, and resilience. This narrative framework bridges abstract theory and actionable strategy, offering scholars and practitioners a fresh, integrative lens for cultivating entrepreneurial ecosystems. This research contributes to the broader discourse on EEs by providing an accessible yet robust conceptual model that bridges the gap between abstract theory and practical application. The metaphorical framework enhances understanding and decision-making for policymakers, ecosystem developers, and researchers, emphasizing the importance of holistic, adaptive, and inclusive approaches to entrepreneurship support. Through this work, I invite readers to explore the intricate beauty and challenges of cultivating entrepreneurship ecosystems, drawing inspiration from the natural world to inform sustainable and impactful development.

Keywords: Entrepreneurship Ecosystem, Complexity Theory, Design, Institutional Leadership, Narrative Metaphor

1. Introduction

Entrepreneurship ecosystems (EEs) are complex networks of interconnected actors, resources, and institutions that foster innovation, economic growth, and entrepreneurial success (Isenberg 2010). Over the years, scholars and practitioners have increasingly turned to metaphors to describe these ecosystems, (Pilinkienė & Mačiulis 2014) drawing parallels with biological systems to capture their dynamic and interdependent nature. However, these metaphors often stop short of exploring the intricate processes and relationships that sustain and challenge these ecosystems in practice.

This paper proposes an expanded metaphor: the entrepreneurial ecosystem as a garden. Gardens, much like ecosystems, require careful cultivation, diverse elements working in harmony, and constant adaptation to changing conditions. By extending the biological analogy, this metaphor emphasizes the roles of intentionality, stewardship, and resilience in fostering thriving entrepreneurial environments.

The inspiration for this metaphor emerged during my work with Manizales Más, a regional entrepreneurship ecosystem in Colombia (Molina & Maya 2018). Observing the intricate interactions between its stakeholders—entrepreneurs, policymakers, educators, and investors—I recognized similarities with the processes and elements found in natural ecosystems. Discussions with thought leaders like Daniel Isenberg and insights from value ecology literature further shaped this perspective, revealing the critical need to consider both cooperation and competition in building sustainable EEs.

Using a design-driven methodology that combines theoretical inquiry with empirical observations, this paper unpacks the gardener metaphor to provide a practical framework for understanding and nurturing entrepreneurship ecosystems. Key questions guide this exploration: What is a garden made of? Who is the gardener? What about the weeds? Through these questions, the paper seeks to reframe the way we think about EEs, offering insights into their composition, the roles of various actors, and the challenges they face.

By bridging art, science, and practice, this work contributes a novel perspective to the discourse on EEs. It highlights the importance of intentional design, collaboration, and adaptability in fostering sustainable entrepreneurial growth, providing value to scholars, practitioners, and policymakers alike.

2. Background

During my doctoral research and close collaboration with the Manizales Más entrepreneurship ecosystem, I became intrigued by the potential of expanding the biological metaphor often associated with entrepreneurial ecosystems (EEs). While the term "ecosystem" inherently suggests a biological analogy, I realized that the

richness of natural symbolism offers untapped potential to explain the complex elements and relationships that define EEs.

A pivotal moment in shaping this perspective occurred during a conversation with Daniel Isenberg at the ZERI Pavilion in Manizales. Reflecting on his role in fostering entrepreneurial ecosystems globally, he remarked that his work was akin to scattering seeds: "Sometimes it falls on concrete, sometimes it falls on water, sometimes it falls on great land and an ecosystem flourishes." While his words highlighted the randomness and variability inherent in ecosystem development, they left me unsettled. I found myself frustrated and even disheartened, as his description seemed to overlook the nuanced interactions and sustained efforts of the agents actively cultivating these ecosystems.

This frustration prompted me to delve deeper into the theoretical underpinnings of ecosystems. A key insight came from Den Ouden (2011), who emphasized the holistic and dynamic nature of value creation in ecosystems, highlighting a "competitive and cooperative environment in which members create value in different roles." This perspective clarified my discomfort: the contributions of the many actors within the ecosystem, which I witnessed firsthand in Manizales Más, were being overshadowed by a reductionist view of ecosystem development.

Inspired by this realization, I began exploring the parallels between natural ecosystems, such as gardens, and entrepreneurial ecosystems. Through iterative modelling processes, the metaphor of the gardener began to take shape. This metaphor offers a lens through which to understand EEs, blending theoretical and empirical insights with a deductive yet speculative approach. It also reflects the interdisciplinary nature of design, which seamlessly combines art and science to make complex systems comprehensible.

This paper addresses three central questions to unpack the gardener metaphor: What is a garden made of? Who is the gardener? And what about the weeds? These questions frame an exploration of the components, roles, and interactions within entrepreneurial ecosystems, culminating in a holistic understanding of their dynamics, growth, and challenges.

3. Theoretical Framework: Complexity, Leadership, and Metaphor

3.1 Complexity and Adaptive Systems

Complexity theory challenges linear, input-output models of innovation by emphasizing emergence, feedback loops, and adaptation (Berkes et al., 2003; Uhl-Bien et al., 2007). Entrepreneurship ecosystems, in this view, function as socio-technical systems where agents co-evolve with their environments, responding to both endogenous interactions and exogenous shocks.

3.2 Distributed and Institutional Leadership

Leadership within ecosystems is rarely centralized. Instead, it is distributed across actors who perform complementary roles—policy champions, institutional entrepreneurs, ecosystem weavers. Uhl-Bien and Marion (2009) define such leadership as the process by which adaptive outcomes are generated in conditions of interdependence. This paper argues that ecosystem "gardeners" are archetypes of such leadership—curating, cultivating, pruning, and intervening strategically.

3.3 Metaphor as Method

Metaphors help make sense of complexity by offering heuristic analogies that draw on familiar domains to explain abstract or systemic ones (Lakoff & Johnson, 1980; Schön, 1983). The garden metaphor extends biological and ecological analogies common in EE discourse but goes further by emphasizing intentionality, aesthetics, and care—values often underrepresented in economic modelling. Following Dorst (2015), this metaphor was developed through a design-based, abductive process blending empirical observation with speculative reasoning.

4. Methodology: A Hermeneutic-Design Approach

This research adopts a hermeneutic and design-based methodology informed by grounded theory principles. The data source was long-term immersion in the Manizales Más ecosystem, including interviews, design workshops, and stakeholder dialogues conducted between 2016 and 2020. The metaphor of the gardener emerged as a way to synthesize complex findings and communicate them effectively to both academic and practitioner audiences.

Rather than test hypotheses, the goal was to construct a metaphorical model capable of generating insights, guiding action, and provoking reflection. This is aligned with speculative design methods (Auger, 2013) that use narrative and symbolism to reframe problems and imagine alternative futures.

5. What Constitutes a Garden?

To answer the question "What is a garden made of?" one might immediately think of plants, soil, pollinators, fertilizers, seedbeds, water, gardening tools, and migrating animals. In the context of entrepreneurial ecosystems, these elements correspond respectively to markets, culture, human capital, public policy, support entities, finance, administration, and external relationships. This section develops the analogies between the essential elements of a garden and the core components of an entrepreneurial ecosystem. The full metaphorical framework will be unveiled in Section 4, where the gardener metaphor is presented in its entirety.

Let us now explore how this analogy unfolds into a cohesive metaphor:

5.1 Plants: Markets

In this metaphor, the market dimension of an entrepreneurial ecosystem is represented by plants. Plants encompass all kinds of enterprises, from the nascent business idea—akin to a seed that requires careful nurturing before planting—to the towering tree, symbolizing a mature firm integrated within a forest-like entrepreneurial network. The diversity of plant species mirrors the variety of sectors, while their size signifies different stages of business development.

A seed evolves into a plant, then a tree, and eventually becomes part of a forest, much like a business idea progresses to a business model, then to a firm with defined capabilities, and ultimately integrates into an entrepreneurial ecosystem. A balanced garden requires both youthful energy, represented by seeds and young plants, and the stability provided by mature trees, which offer shade and enrich the soil, fostering a conducive environment for future growth.

Entrepreneurial ecosystems like Manizales Más are not vast forests but rather dynamic, diverse gardens capable of nurturing various agents. This diversity underscores the interplay between new ventures and established businesses, which together form a thriving market.

5.2 Soil/Substrate: Culture

Soil symbolizes the cultural dimension of an entrepreneurial ecosystem. Just as soil consists of organic and inorganic components, culture comprises tangible and intangible elements that foster entrepreneurial behaviour and perception. The inorganic aspects of soil represent pre-existing cultural traits intrinsic to a location—elements often taken for granted. The organic components, on the other hand, embody the dynamic aspects of culture, such as entrepreneurial gatherings, collaborative initiatives, and networks that transform and enrich the ecosystem over time.

A robust entrepreneurial culture acts as fertile soil, enabling diverse agents to collaborate effectively toward shared objectives. While the inherent attributes of a location might be favourable for entrepreneurship, it is the organic, transformative interactions within the culture that ultimately determine the soil's capacity to support sustained entrepreneurial growth.

5.3 Pollinators: Human Capital

Pollinators, essential for the fertilization of flowers and the production of seeds and fruit, represent the human capital dimension of the ecosystem. In nature, pollinators include bees, wasps, butterflies, and even small

mammals. Within entrepreneurial ecosystems, these correspond to professors, mentors, advisors, peer entrepreneurs, and institutions like universities.

A garden with a rich variety of pollinators thrives through cross-pollination, enhancing plant growth and productivity. Similarly, a diverse and vibrant pool of human capital fosters learning, sharing of best practices, and collaborative innovation. Professors, mentors, and advisors play distinct but interconnected roles—much like bees and butterflies—ensuring the ecosystem's sustained vitality and success.

5.4 Fertilizers: Public Policy

Fertilizers, which enrich soil and enhance plant growth, parallel the role of public policy in entrepreneurial ecosystems. Fertilizers, such as potassium, phosphorus, and nitrogen, gradually transform soil composition to strengthen plants. Similarly, public policies—such as entrepreneurship laws, support projects, and tax incentives—can significantly impact the ecosystem's development. These policies act as layers of topsoil, providing essential nutrients and protection.

Effective public policy fosters entrepreneurship by creating favourable conditions for business growth. Conversely, detrimental policies can strip the ecosystem of vital nutrients, leading to stagnation or decline, much like a neglected garden where plants wither and die.

5.5 Seedbeds/Greenhouses: Support Entities

Seedbeds and greenhouses correspond to the support entities dimension of entrepreneurial ecosystems. Seedbeds provide controlled environments with nutrient-rich soil to nurture young seedlings, while greenhouses shield vulnerable plants from harsh external conditions. Analogously, support entities—such as chambers of commerce, accelerators, incubators, and entrepreneurship networks—offer structured programs and resources to help nascent businesses develop capabilities and survive their initial stages.

These entities function as safe spaces where entrepreneurs receive guidance, training, and resources, enabling them to transition from fragile startups to robust enterprises capable of thriving within the broader ecosystem.

5.6 Water: Finance

Water represents finance within the ecosystem. Water is vital for nutrient transport and physiological processes in plants, just as financial resources are essential for business operations and growth. In a garden, watering systems range from simple hoses to advanced sprinklers, depending on the size and complexity of the garden. Similarly, financial resources vary from personal loans and microcredits to angel investors and venture capital networks.

The financial needs of a business depend on its stage of development and sector. Startups typically require frequent injections of capital for growth, while established firms may seek larger, targeted investments for expansion or innovation.

5.7 Gardening Tools: Administration

Gardening tools symbolize the administration dimension of the ecosystem. Basic tools, such as shovels and rakes, address the needs of small gardens, while larger gardens may require wheelbarrows, ladders, or even chainsaws for complex tasks. Similarly, entrepreneurial ecosystems demand administrative structures appropriate to their scale and complexity.

From boards of directors to program managers, effective administration ensures that resources are allocated efficiently and that diverse agents within the ecosystem work harmoniously toward shared goals.

5.8 Migrating Animals: External Relations

Migrating animals, which traverse vast distances in search of better conditions, represent the external relationships of entrepreneurial ecosystems. These animals include investors, researchers, and advisors who temporarily engage with the ecosystem, bringing fresh perspectives, resources, and opportunities.

In the case of Manizales Más, external relationships have included collaborations with institutions like Babson College and MIT, as well as insights from thought leaders like Daniel Isenberg. These interactions enrich the ecosystem by introducing innovative ideas and fostering global connections.

6. Who is the Gardener?

The gardener plays a vital role in shaping and nurturing the entrepreneurship ecosystem. Much like a gardener carefully plans and tends to their garden, an effective ecosystem architect envisions the desired end result, designs the framework, and cultivates the various elements that will work together to achieve that vision. The gardener's role, much like that of a designer, is crucial in the process of ecosystem development.

6.1 The Gardener that Just Spreads the Seed Around

Some view the gardener as a "sower" who casts seeds widely, hoping for the best. This approach is similar to the parable of the sower: some seeds will thrive, while others may falter. In the context of entrepreneurship ecosystems, this perspective aligns with a more laissez-faire, seasonal crop farming approach—where the focus is on planting many seeds (i.e., fostering many ideas or startups) and hoping that some of them grow into successful ventures. This type of gardener is focused on the quantity of seeds planted rather than the specific care each plant needs.

6.2 The Gardener Working for Curbside Appeal

This type of gardener is focused on improving the exterior, making the garden inviting for outsiders. In the entrepreneurship ecosystem, this could represent efforts to enhance the attractiveness of a region or market to potential investors, businesses, and talent. It's about creating an appealing environment that draws people in, often by highlighting the best aspects of the ecosystem, even if that means focusing more on aesthetics than on the internal growth processes.

6.3 The Gardener Who Dreams with a Topiary

The gardener who envisions a topiary—a sculptural, artistic arrangement of plants—is one who is deeply invested in the long-term process. This gardener is careful and strategic, selecting the right plants, soil, fertilizers, and tools, and considering the environment in which the topiary will flourish. Like a designer who maps out every detail, this gardener is attuned to each aspect of the ecosystem and understands the time, patience, and tools required to create a carefully shaped and sculpted space. In entrepreneurship terms, this gardener represents the thoughtful, long-term strategist who builds a robust ecosystem by considering the nuanced interplay of all its components.

6.4 The Versailles Gardener

The Versailles garden, one of the most remarkable in the world, took decades to create, requiring the work of countless people, designers, engineers, and gardeners. This metaphor draws a parallel to the creation of an advanced, successful entrepreneurship ecosystem—one that is planned meticulously but also allows for natural growth and interactions. Just as Versailles integrates various spaces—greenhouses, flower beds, large tree forests, and fountains—an ideal entrepreneurship ecosystem combines infrastructure, resources, and spaces for innovation, fostering interactions and creating micro-ecosystems within the broader system. This type of gardener ensures that all elements of the ecosystem work in harmony, from the larger framework to the smallest details, creating a thriving environment where growth can happen organically and sustainably.

Each of these gardeners, whether they are sowing seeds widely, focusing on the outward appearance, shaping topiaries, or planning grand, interconnected landscapes, brings a unique approach to the creation and cultivation of an entrepreneurship ecosystem. The role of the gardener is integral in ensuring that the ecosystem has the right conditions to thrive.

7. What About the Weeds?

In any entrepreneurship ecosystem, there can be challenges that hinder growth, much like weeds in a garden. Weeds represent unwanted businesses or ventures that may emerge in the ecosystem, often due to

misallocation of resources or unintended investments. These weeds can crowd out the plants (entrepreneurs and startups) that were intentionally nurtured. Examples of weeds might include:

- **Unsustainable businesses:** Companies that rely on short-term gains without a solid business model, often causing market instability or leading to wasteful investment.
- **Overly competitive ventures:** When too many businesses with similar, unoriginal ideas compete for the same resources, causing market saturation without contributing to innovation or diversity.
- **Fraudulent or exploitative ventures:** Scams or unethical businesses that may thrive in a poorly regulated environment, diverting resources and attention away from legitimate entrepreneurs.

These are just a few of the unwanted elements that can emerge in an ecosystem. Much like a gardener who must remove weeds without harming the plants, an ecosystem architect must find a balance between addressing negative influences (the weeds) and fostering healthy growth. In the context of entrepreneurship, this means using the right tools, such as regulations, public policy, and administrative measures, to shape the ecosystem and remove harmful elements without stifling innovation.

The tools used by the gardener (administrator or policymaker) are essential in creating a conducive environment for growth. These tools allow for the careful regulation and nurturing of the ecosystem, ensuring that it remains healthy and focused on supporting the desired growth. In the same way that a gardener uses fertilizer, pruning tools, or selective weeding to maintain the balance, public policy and administration act as the tools that keep the entrepreneurship ecosystem clear of obstacles while encouraging innovation. With the right care and attention, the ecosystem can evolve into the kind of landscape envisioned—whether that be a topiary, an oasis, a thriving forest, or even a masterpiece like the Versailles Garden.

8. The Gardener Metaphor Turning into the Tale of a Gardener

Creating an entrepreneurship ecosystem is akin to planting a garden. The first step is to define the size, the look, and what type of plants you'd like to cultivate. As I reflect on this metaphor, I am transported into a tale of a gardener. I imagine being a gardener in the mid-17th century, tasked with the monumental responsibility of shaping a vast piece of land into what would become one of the most beautiful and opulent gardens in the world—The Versailles Garden.

Every garden begins with a desire to create something special—whether it's a green space, a flowery spot, or just a place that offers more than the mundane expanse of grass in front of your house. But what we don't always understand initially is the immense thoughtfulness that goes into the process. The gardener is faced with the challenge of turning barren land into something extraordinary, and this requires careful planning. Where will people walk? What kind of soil is available? How will water be directed throughout the space? What kind of care will the plants require to survive the changing seasons? And most importantly, how can all of this please a king who desires a legacy built on opulence?

Some might call me obsessive, but my curiosity led me to learn more about the Versailles Garden and its chief gardener, André le Nôtre. Coming from a family of gardeners, he had a vast knowledge of plants and soil, but what truly struck me was that he also studied arts, mathematics, and architecture. This combination of expertise helped him design a garden that wasn't just beautiful but also functional, a place where nature met artistry. Le Nôtre's design made full use of all available water sources and strategically played with light and shade. Shaded spaces were carefully balanced with brighter areas. The parterres and primary alleys were punctuated by statues and yew trees sculpted into stunning forms, which helped make Versailles famous for its topiary art. But le Nôtre never worked alone. As the chief gardener, he led an army of people, each with different roles, but all ultimately responding to his vision. While there were areas dedicated to topiaries, there were also forests, greenhouses, meadows, and grazing areas to manage. In this grand design, I see how diverse elements—each managed by different gardeners—can come together to create something magnificent.

Now, back in the 21st century, my dream is to foster entrepreneurship ecosystems as complex and beautiful as the Versailles Garden. These ecosystems would not thrive solely on exclusive advantages or on a large number of people working within a single industry. Instead, they would nurture and cultivate diversity. A place where a university student with an idea has the same opportunities as someone who has just retired and decides it's finally time to pursue that project they once abandoned. A place where large companies help smaller businesses grow.

In this vision, the flow of information, technology, and people creates a new wave of innovation and social well-being for all stakeholders—not just investors, but also local communities, workers, and all those who can contribute to an ever-evolving landscape of connections and transformation. My ideal entrepreneurship ecosystem is a social network that embraces new members, skills, ideas, and approaches, and achieves impressive results that go beyond financial measures. These results would include trust, collaboration, social impact, and overall well-being.

9. Conclusions About the Interactions, Blossoming, and Withering

This paper repositions the entrepreneurship ecosystem not as an emergent outcome of market forces alone, but as a deliberately cultivated and co-designed system that requires continuous care, adaptation, and systemic thinking. Drawing on the gardener metaphor, this study highlights the importance of intentional leadership, institutional alignment, and collaborative processes in fostering vibrant and resilient ecosystems. Adopting a gardener's mindset—one that balances planning with responsiveness—may prove particularly valuable for policymakers, educators, and ecosystem developers seeking to enhance entrepreneurial capacity in complex environments.

The metaphor yields several key insights:

- **Soil as Institutional Culture:** The fertility of the ecosystem is shaped by the level of trust and collaboration among institutions. Just as nutrient-rich soil supports plant growth, ecosystems rooted in strong institutional relationships provide a conducive environment for entrepreneurial activity.
- **Pollinators as Human Capital:** Mentors, educators, and advisors act as pollinators, facilitating the exchange of knowledge and catalysing growth. Their presence enhances cross-fertilization within the ecosystem, enabling faster and more robust entrepreneurial development.
- **Fertilizer as Public Policy:** Targeted, well-designed public policies enrich the ecosystem by enhancing its structural conditions. Much like fertilizer boosts plant growth, effective policies nourish ecosystem actors and align incentives for long-term value creation.
- **Seedbeds as Support Mechanisms:** Incubators, accelerators, and business support centers serve as controlled environments that nurture early-stage ventures. These seedbeds reduce vulnerability and prepare startups to thrive in more competitive, open conditions.
- **Water as Financial Capital:** Finance is essential for sustaining entrepreneurial initiatives. Like water, it must be appropriately distributed—responsive to both the scale and phase of enterprise development—to prevent stagnation or over-saturation.
- **Tools as Administrative Infrastructure:** Effective administration provides the operational tools required to sustain ecosystem activity. From governance structures to management practices, these tools ensure alignment, coordination, and execution across actors and initiatives.
- **Migrating Animals as External Linkages:** External stakeholders—such as international investors, diaspora entrepreneurs, or global thought leaders—can inject fresh perspectives and resources. Their temporary yet strategic engagements can significantly alter the ecosystem's trajectory.
- **Control and Uncertainty:** The gardener must discern between controllable variables (e.g., seedbeds, water systems) and those beyond their influence (e.g., migratory flows, macroeconomic shifts). Resilience lies in managing the former while adapting to the latter.
- **Admiration vs. Understanding:** Just as gardens may be admired without appreciation for the labour behind them, entrepreneurship ecosystems are often celebrated without full recognition of the invisible, continuous work required to design, sustain, and evolve them.
- **Lifecycle and Regeneration:** Ecosystems, like gardens, require ongoing maintenance, periodic renewal, and structural adaptation. Over time, some elements will need to be replaced, redesigned, or phased out to maintain systemic health and relevance.

As Pilinkienė and Mačiulis (2014) remind us, each ecosystem analogy must be context-sensitive, reflecting its unique configuration of actors, interactions, and goals. The garden metaphor is not a universal model but a situated framework that highlights the co-evolutionary and cultivated nature of entrepreneurship ecosystems. While techniques and tools may be shared across ecosystems, their application and success will ultimately depend on local conditions, leadership vision, and the dynamic interplay among system components.

Future research may build on this metaphor by operationalizing its elements into evaluative frameworks, exploring its resonance across diverse cultural and institutional contexts, or examining its utility in guiding ecosystem interventions. As global challenges grow more complex, the demand for thoughtful, adaptive, and inclusive ecosystem cultivation becomes not only relevant—but imperative.

Ethics Declaration

This research did not involve human participants, animals, or sensitive personal data. Therefore, ethical clearance was not required. All sources used in the study have been appropriately cited, and the research adheres to academic integrity standards.

AI Declaration

AI tools were used in the preparation of this paper to enhance the coherence and clarity of the writing. As the author's primary language is Spanish, AI-assisted revision was applied to refine the style and ensure proper linguistic accuracy after translation. However, all intellectual contributions, analysis, and conclusions presented in this work remain solely the responsibility of the author.

References

- Auger, J. (2013). Speculative design: crafting the speculation. *Digital Creativity*, 24(1), 11–35.
- Autio, E., Nambisan, S., Thomas, L., & Wright, M. (2018). Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, 12(1), 72-95.
- Berkes, F., Colding, J., & Folke, C. (2003). *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge University Press.
- Den Ouden, E. (2011) *Innovation design: Creating value for people, organizations and society*. Springer Science & Business Media.
- Dorst, K. (2015). *Frame innovation: Create new thinking by design*. MIT Press.
- Isenberg, D.J. (2010) 'How to start an entrepreneurial revolution', *Harvard Business Review*.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. University of Chicago Press.
- Molina Osorio, V. (2017, June) 'The mutualism relation within the entrepreneurial ecosystem', *International Symposium on Electronic Art 2017: Bio-Creation & Peace*, pp. 688-691.
- Molina, V. & Maya, J. (2017, September) 'How should an entrepreneurship ecosystem be? Entrepreneurship ecosystems as an artifact of design', *European Conference on Innovation and Entrepreneurship*, pp. 734-741. Academic Conferences International Limited.
- Molina, V. & Maya, J. (2018) 'Successful entrepreneurship ecosystems for regional development: A proposal for their modelling and creation', *International Journal of Innovation and Regional Development*, 8(4), pp. 322-336. Available at: <https://doi.org/10.1504/IJIRD.2018.097481>
- Molina, V. & Valbuena, W.S. (2019) 'Mapping creativity and design within the entrepreneurship ecosystem', *Kindai Management Review*, 7, pp. 39-53.
- Pilinkienė, V. & Mačiulis, P. (2014) 'Comparison of different ecosystem analogies: The main economic determinants and levels of impact', *Procedia - Social and Behavioral Sciences*, 156, pp. 365-370.
- Schön, D.A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.
- Stam, E. (2015) 'Entrepreneurial ecosystems and regional policy: A sympathetic critique', *European Planning Studies*, 23(9), pp. 1759-1769.
- Stam, E. (2015). Entrepreneurial ecosystems and regional policy: A sympathetic critique. *European Planning Studies*, 23(9), 1759-1769.
- Uhl-Bien, M., & Marion, R. (2009). Complexity leadership in bureaucratic forms of organizing: A meso model. *The Leadership Quarterly*, 20(4), 631–650.
- Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly*, 18(4), 298–318.