ARTÍCULO PRODUCTO DE INVESTIGACIÓN

# Agricultural sustainability: integrating agrosciences and ecological economics

## Sostenibilidad agrícola: integrando agrociencias y economía ecológica

Dustin Tahisin Gómez Rodríguez[1]
*Corporación Universitaria De Asturias*

Recibido: 29.03.2025
Aceptado: 30.05.2025

## Resumen

**Antecedentes:** En el presente se reconoce que los desafíos agrícolas contemporáneos (degradación del suelo, pérdida de biodiversidad, cambio climático) requieren enfoques interdisciplinarios. La economía ecológica y las agrociencias emergen como campos clave para abordar estos problemas, al integrar sostenibilidad ambiental, equidad social y eficiencia económica. Estudios previos destacan la necesidad de prácticas agrícolas diversificadas y políticas que internalicen los costos ambientales, pero persisten brechas en su implementación efectiva. Este trabajo explora cómo la integración de estos campos puede generar sistemas agrícolas más resilientes. **Métodos:** Se empleó una metodología cualitativa con revisión sistemática bajo los lineamientos PRISMA. Se analizaron 187 documentos (136 artículos, 38 informes institucionales, 13 revisiones) de bases como Scopus y WoS (2000-2024), utilizando ecuaciones de búsqueda específicas y software Vantage Point para minería de datos. Se identificaron categorías analíticas (economía ecológica, agrociencias) y emergentes (pérdida de biodiversidad, degradación del suelo). **Resultados:** Los hallazgos revelan que: (1) La simplificación de paisajes agrícolas reduce la biodiversidad, requiriendo prácticas como

[1] dustin.tgr@gmail.com
https://orcid.org/0000-0001-5329-2300

agroforestería y rotación de cultivos. (2) La degradación del suelo exige manejo sostenible (agricultura de conservación). (3) La integración de principios económicos ecológicos en políticas puede mitigar dependencia de insumos externos y promover equidad. **Conclusiones:** La sinergia entre economía ecológica y agrociencias es crucial para diseñar sistemas agrícolas sostenibles. Los hallazgos subrayan la urgencia de políticas que incentiven prácticas regenerativas y valoren servicios ecosistémicos, aportando un marco para futuras investigaciones y acciones en seguridad alimentaria y justicia ambiental.

**Palabras clave:** economía rural, economía regional, economía colectiva, desarrollo agrícola, desarrollo económico y social.

## Abstract

**Background:** Current agricultural challenges (soil degradation, biodiversity loss, climate change) require interdisciplinary approaches. Ecological economics and agrosciences are key fields for addressing these issues by integrating environmental sustainability, social equity, and economic efficiency. Previous studies highlight the need for diversified agricultural practices and policies that internalize environmental costs, but gaps persist in their effective implementation. This study explores how integrating these fields can create more resilient agricultural systems. **Methods:** A qualitative methodology was employed, using a systematic PRISMA-guided review. A total of 187 documents (136 research articles, 38 institutional reports, 13 reviews) from databases such as Scopus and WoS (2000–2024) were analyzed. Specific search equations and Vantage Point software were used for data mining. Analytical categories (ecological economics, agrosciences) and emerging themes (biodiversity loss, soil degradation) were identified. **Results:** Key findings include: (1) Agricultural landscape simplification reduces biodiversity, necessitating practices such as agroforestry and crop rotation. (2) Soil degradation requires sustainable management (e.g., conservation agriculture). (3) Integrating ecological economics principles into policies can reduce dependence on external inputs and promote equity. **Conclusions:** The synergy between ecological economics and agrosciences is crucial for designing sustainable agricultural systems. The findings emphasize the need for policies that incentivize regenerative practices and value ecosystem services, providing a framework for future research and action in food security and environmental justice.

**Keywords:** rural economics, regional economics, collective economics, agricultural development, economic and social development.

## Introduction

The dialogues between Ecological Economics and Agrosciences constitute a vital and complex field of study that identifies contemporary challenges in agriculture, natural resource management, and sustainable development (Correa et al., 2022; Maldonado, 2021). Both disciplines converge in the pursuit of innovative solutions that promote efficient and sustainable agricultural production while safeguarding ecosystem integrity and social equity (Rendón & Gómez, 2022; World Bank, 2006). Therefore, Ecological Economics, as a discipline, focuses on understanding the complex interactions between human economy and natural systems (Escobar, 2015). It seeks to integrate the principles of environmental sustainability and social equity into economic processes, recognizing the fundamental dependence of the human economy on ecosystem services provided by nature (Zarta, 2018; Pavone, 2012). On the other hand, Agrosciences encompass a diverse set of scientific disciplines dealing with agricultural production, crop management, land use, and natural resource conservation in the agricultural context (Gómez, 2022; Chacón, 2021).

One key area of convergence between Ecological Economics and Agrosciences is the promotion of sustainable agricultural practices (Purvis et al., 2019). Sustainable agriculture seeks to maximize food production efficiently and equitably while minimizing negative environmental impacts (Reyes, 2016; Trigo et al., 2013). This is where Ecological Economics contributes analytical tools to assess the environmental costs and benefits of different agricultural practices, as well as to design policies that internalize environmental impacts into economic decisions (Rodríguez,2025; Rojas & Daly, 2019).

Furthermore, Ecological Economics provides theoretical frameworks such as the economic valuation of ecosystem services, which allow quantifying the economic benefits derived from biodiversity conservation, soil protection, and sustainable water management in agriculture (Rodríguez,2025; Sachs et al., 2020). These approaches help policymakers and farmers better understand the economic and environmental impacts of their decisions, facilitating the transition to more sustainable agricultural systems (Maldonado, 2023; Gómez et al., 2021).

Therefore, the convergence between Ecological Economics and Agrosciences lies in promoting social equity in agriculture (Gómez, 2024ª; Departamento Nacional de Planeación, 2016). The unequal distribution of benefits and costs of agricultural production is a persistent problem in many regions of the world (Garzón et al., 2022; Gómez et al., 2018). Ecological Economics leans towards economic approaches and policies that promote social equity and environmental justice in the distribution of resources and opportunities in agriculture (Gómez, 2024b; Rosas-Baños, 2012). Agrosciences, on the other hand, contribute technologies and agricultural practices that can improve access and livelihoods for small farmers and rural communities (Sánchez & Herrera, 2017). Consequently, the overall goal of the article was to explore the synergies between modern agricultural practices and the principles of Ecological Economics to promote sustainable and efficient production systems. And the problem question is: How can modern agricultural practices be aligned with the fundamental principles of Ecological Economics to drive agricultural production systems that are both sustainable and efficient?

## 1. Material and methods

The methodological strategy employed in this analysis adopts a qualitative approach and is structured into two distinct dimensions. Initially, explorations were conducted using search equations employing bibliometric techniques, encompassing the analytical categories of



Volumen 2. Número 2. Julio - Diciembre 2025
ISSN: 3028-4546 (En línea)

"Ecological Economics and Agrosciences" during the period 2000-2024 (Castro et al., 2017; Carrizo, 2000).

Table 1. An example of a search equation for the category "Economía Ecológica" or "Ecological Economics"

| **Database:** | **Search Equations** |
|---|---|
| **WoS** | Tema: (("Economía Ecológica OR *Ecological Economics*"))<br>Índices=SCI-EXPANDED, SSCI, A&HCI, ESCI Período de tiempo=Todos los años |
| | Tema: (("Economía Ecológica OR *Ecological Economics* "))<br>Refined por: Años de publicación: (2016 OR 2017 OR 2010 OR 2013 OR 2015 OR 2012 OR 2009 OR 2011 OR 2014 OR 2008 OR 2020 OR 2021 OR 2022 OR 2019 OR 2018 OR 2006 OR 2005 OR 2004 0R 2003 OR 2002 02 2001 0R 2000)<br>Índices=SCI-EXPANDED, SSCI, A&HCI, ESCI Período de tiempo=Todos los años |
| | Tema: ("Economía Ecológica OR *Ecological Economics*) "<br>Índices=SCI-EXPANDED, ESCI, A&HCI, SSCI Período de tiempo=Todos los años |
| **Scopus** | TITLE-ABS-KEY (“Economía Ecológica OR *Ecological Economics* “) |
| | TITLE-ABS-KEY ((“Economía Ecológica OR *Ecological Economics* “)) |
| | TITLE-ABS-KEY ((“Economía Ecológica OR *Ecological Economics*”)) AND (LIMIT-TO (PUBYEAR, 2018) OR LIMIT- TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-<br>TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-<br>TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT- TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-<br>TO (PUBYEAR, 2010) OR LIMIT-TO (PUBYEAR, 2009) OR LIMIT-<br>TO (PUBYEAR, 2008) OR LIMIT-TO (PUBYEAR, 2000) OR LIMIT- |

Source: Own elaboration

Tabla 2. An example of a search equation for the category Agrociencias or *Agrosciences*

| **Database** | **Search Equations** |
|---|---|
| **WoS** | Tema: (("Agrociencias or *Agrosciences*)"))<br>Índices=SCI-EXPANDED, SSCI, A&HCI, ESCI Período de tiempo=Todos los años |



Volumen 2. Número 2. Julio - Diciembre 2025
ISSN: 3028-4546 (En línea)

| | |
|---|---|
| | Tema: (("Agrociencias or *Agrosciences*"))<br>Refinado por: Años de publicación: (2016 OR 2017 OR 2010 OR 2013 OR 2015 OR 2012 OR 2009 OR 2011 OR 2014 OR 2008 OR 2020 OR 2021 02 2022 OR 2019 OR 2018 OR 2006 OR 2005 OR 2004 0R 2003 OR 2002 02 2001 0R 2000)<br>Índices=SCI-EXPANDED, SSCI, A&HCI, ESCI Período de tiempo=Todos los años |
| | Tema: ("Agrociencias or *Agrosciences* ")<br>Índices=SCI-EXPANDED, ESCI, A&HCI, SSCI Período de tiempo=Todos los años |
| **Scopus** | TITLE-ABS-KEY ("Agrociencias or *Agrosciences*)") |
| | TITLE-ABS-KEY (("Agrociencias or *Agrosciences*) ")) |
| | TITLE-ABS-KEY (("Agrociencias or *Agrosciences*")) AND (LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-TO (PUBYEAR, 2010) OR LIMIT-TO (PUBYEAR, 2009) OR LIMIT-TO (PUBYEAR, 2008) OR LIMIT-TO (PUBYEAR, 2000) OR LIMIT- |

Source: Own elaboration

Tabla 2. Relationship between Analytical Categories and Emerging Categories

| General Objective | Analytical Categories | Emerging Categories |
|---|---|---|
| Exploring synergies between modern agricultural practices and ecological economic principles to promote sustainable and efficient production systems | Agrosciences Ecological Economics | Loss of biodiversity in modern agricultural systems. Soil degradation and resource depletion in conventional agriculture. Economic and environmental challenges in modern agriculture. |

Source: Own elaboration


ISSN: 3028-4546 (En línea)

The second phase of the study involved the execution of a systematic literature review. This review was instrumental in establishing connections between the analytical categories of Ecological Economics and Agrosciences (López et al., 2025). For this purpose, the PRISMA methodology was implemented, recognized for its rigor and transparency.

The application of the PRISMA methodology allowed for a detailed and comprehensive analysis of the aforementioned analytical categories over a span of two decades. The focus was on documents that established a correlation between these categories, utilizing renowned databases and indices such as Scopus, Wos, Redalyc, and Dialnet (Aguilera et al., 2020; Barbosa et al., 2020). This procedure followed a series of steps designed to ensure accuracy and transparency in the identification and synthesis of relevant information (Camacho et al., 2023; Miró & Burbano, 2013; Bensman & Leydesdorff, 2009).

The first step was the identification of the research question. Subsequently, a meticulous search was conducted in relevant databases using specific search equations, precisely designed to include relevant documents (Tables 1 and 2). A total of 187 documents were identified, from which those directly related to the analytical categories of interest were selected. Criteria for inclusion and exclusion were then applied to filter the selected documents, ensuring that only those establishing a significant relationship between the analytical categories of Ecological Economics and Agrosciences were considered for analysis. Relevant data from the selected documents, comprising 136 research articles, 38 institutional documents, and 13 reviews, were systematically extracted and recorded (Rincón & Gómez, 2023; Gómez, 2022; Rushforth, 2016; Paramo, 2008).

Subsequently, an integration of the search equations was carried out, which played a crucial role in retrieving information from the databases. These equations were initially integrated with the Vantage Point software, specialized in data analysis and text mining, to ensure efficient and exhaustive search. Next, the extracted data were analyzed and synthesized using appropriate methods for each type of document. Relevant trends, patterns, and relationships between Ecological Economics and Agrosciences were identified. Finally, the findings of the analysis were presented clearly and transparently, following the PRISMA presentation guidelines (Gómez et al., 2016; Paramo, 2008).

## 2. Results and discussion

The relationship between Ecological Economics and Agrosciences is crucial given the fundamental importance of agriculture for environmental sustainability and global food security (Gómez & Aguirre, 2023; Chacón, 2020). Currently, agriculture faces increasingly significant challenges such as soil degradation, water scarcity, biodiversity loss, climate change, and the growing demand for food due to population growth (Sonnino, 2011; Escobar, 2011). In this context, integrating economic and scientific approaches to address these challenges becomes imperative. The emerging categories resulting from the systematization of documents are described below.

### 2.1 Biodiversity loss in modern agricultural systems

Biodiversity loss in intensive agricultural systems is a multidimensional challenge that requires a comprehensive and collaborative approach combining knowledge from Agrosciences and principles of Ecological Economics (Gómez, 2022; Escobar, 2018). This issue primarily arises due to the simplification of agricultural landscapes, where extensive monocultures are prioritized, and natural landscape elements essential for biodiversity maintenance are removed. Addressing this issue involves designing strategies that reconcile agricultural production with biodiversity conservation, recognizing that both aspects are crucial for the long-term sustainability of agricultural systems (Maldonado, 2018; Rodríguez et al., 2018).

A key strategy to identify biodiversity loss in intensive agricultural systems is the promotion of more diversified and sustainable agricultural practices (Arias, 2021; Kalmanovitz, 2019). This entails moving away from extensive monocultures and adopting more diverse agricultural systems such as agroforestry, crop rotation, intercropping, and no-till farming.



Volumen 2. Número 2. Julio - Diciembre 2025
ISSN: 3028-4546 (En línea)

These practices allow for the creation of more diverse habitats that can host a wide range of plant and animal species, thereby contributing to biodiversity conservation (Vanegas, 2017; Berdergué et al., 2012).

Additionally, it is essential to integrate natural landscape elements into agricultural systems, such as hedges, riparian forests, native vegetation areas, and biological corridors (Torrens, 2017; Llanos, 2010). These elements provide shelter, food, and breeding sites for numerous species of flora and fauna, helping to maintain biodiversity in agricultural landscapes. The integration of these elements can also contribute to improving soil quality, regulating local climate, and providing other beneficial ecosystem services for agricultural production (Rodríguez et al., 2018; Sánchez & Herrera, 2017).

Another fundamental aspect is the proper management of natural resources such as soil and water to minimize negative impacts on biodiversity (Rodríguez, 2024; Rendón & Gómez, 2020). Soil erosion, water pollution, and loss of aquatic habitats are common problems in intensive agricultural systems that can negatively affect biodiversity. Therefore, it is crucial to implement soil and water management practices that are sustainable and environmentally friendly, such as soil conservation, integrated pest management, and conservation agriculture (UN, 2020; OECD, 2020).

In addition to specific agricultural practices, it is necessary to consider economic incentives and policies that can promote biodiversity conservation in intensive agricultural systems. This may include subsidies for the adoption of sustainable agricultural practices, payments for environmental services, environmental certifications, and fiscal incentive policies (Gliessman, 2017; Guzmán et al., 2011). These measures can help offset the additional costs associated with implementing more sustainable agricultural practices and encourage widespread adoption of approaches that promote the coexistence of agricultural production and biodiversity conservation (Gómez et al., 2021; Maldonado, 2017; 2014).



Volumen 2. Número 2. Julio - Diciembre 2025
ISSN: 3028-4546 (En línea)

## 2.2 Soil degradation and resource depletion in conventional agriculture

Soil degradation and resource depletion in conventional agriculture represent critical challenges that threaten the long-term sustainability of agricultural production (Varela, 2017; Rodríguez et al., 2016). These issues arise as a result of intensive agricultural practices that often prioritize short-term production maximization, disregarding environmental limits and the capacity for natural resource regeneration. To effectively address this problem, it is necessary to adopt approaches based on Ecological Economics that promote more sustainable agricultural practices capable of conserving and enhancing soil quality, as well as ensuring resource availability for future generations (Rodríguez et al., 2021; Silva, 2016).

A fundamental strategy to mitigate soil degradation and resource depletion in conventional agriculture is the implementation of soil management practices that promote its long-term health and fertility (Cárdenas & Vallejo, 2016; Altieri et al., 2015). This includes techniques such as crop rotation, no-till farming, conservation agriculture, and the use of cover crops, which help reduce soil erosion, improve its structure, and increase its organic matter content. These practices not only protect the soil from degradation but also contribute to enhancing its ability to retain water and nutrients, resulting in higher agricultural productivity and reduced dependence on external inputs (Caravani et al., 2017; Blanco, 2007).

Another crucial aspect is the diversification of crops and agricultural production systems, which helps reduce pressure on natural resources and improve the resilience of agricultural systems to environmental and climatic impacts (FAO, 2022; Deller et al., 2017). Monocultures in conventional agriculture tend to deplete soil nutrients, increase susceptibility to diseases and pests, and reduce agricultural biodiversity. In contrast, crop diversification can improve soil health, increase biodiversity, and promote more efficient resource use, resulting in more sustainable and resilient agricultural systems (FAO, 2018; Dematteis & Governa, 2005).

Likewise, it is imperative to adopt integrated pest and disease management approaches that minimize the use of chemical pesticides and herbicides, which can have negative effects on soil quality and human and environmental health (Gandulfo & Rofman, 2020; FAO, 2019). Instead of relying solely on synthetic chemical products, agroecological methods such as polyculture, biological pest control, crop rotation, and genetic diversity management can be used to control pest and disease populations in a more natural and sustainable manner. These approaches not only reduce pressure on the environment but can also improve soil health and agricultural biodiversity (Forero, 2010; 2009).

### 2.3 Challenges in modern agriculture: economic and environmental perspectives

Modern agriculture faces a series of economic and environmental challenges that require an integrated and sustainable approach for effective resolution (FAO & ECLAC, 2021). The integration of Ecological Economics principles into agricultural decision-making and related policies can offer a promising pathway to address these challenges and promote more resilient, equitable, and sustainable agricultural systems (Rodríguez et al., 2024; Giraldo, 2018).

One of the main economic challenges in modern agriculture is the dependency on expensive external inputs, such as chemical fertilizers and pesticides, which can have negative impacts on the environment and human health (Hale et al., 2019; Martínez Alier, 2015). Integrating Ecological Economics principles involves considering the economic, social, and environmental costs and benefits of agricultural practices in all their complexity. Rather than focusing solely on short-term production costs, farmers and policymakers should assess the total cost of agricultural practices, including impacts on human health, biodiversity, soil and water quality, and climate change (Gómez & Barbosa, 2023; Leff, 2010).

A strategy to address this challenge is to promote the transition to more diversified and resilient agricultural systems that reduce dependence on external inputs and promote sustainable resource management practices (Garzón et al., 2023; Martínez et al., 2010). This may include implementing agroecological practices such as crop rotation, crop diversification, and integrated pest management, which can reduce the need for chemical pesticides and synthetic fertilizers. By reducing dependence on expensive external inputs, farmers can



Volumen 2. Número 2. Julio - Diciembre 2025
ISSN: 3028-4546 (En línea)

improve their long-term profitability and reduce their vulnerability to fluctuating prices of agricultural chemicals (Gómez et al., 2021; Mora, 2012).

Additionally, integrating Ecological Economics principles into agricultural decision-making and related policies can contribute to the promotion of fairer and more equitable food systems (Vergara, 2020; Salas, 2012). In many cases, farmers face economic challenges due to market power concentration in the hands of a few agribusiness companies, which can impose low prices and unfavorable conditions on farmers. By promoting more diversified and decentralized agriculture models based on Ecological Economics principles, it is possible to strengthen farmers' economic resilience and foster social justice in food systems (Rendón, 2017; Vergara, 2017).

Moreover, it is essential to consider the ecosystem services provided by agroecosystems, such as pollination, pest control, and climate regulation, and promote agricultural practices that conserve and enhance these services (OECD, 2019; Rastoin, 2015). For example, promoting agricultural biodiversity and creating habitats for beneficial insects can help improve pollination and reduce the need for chemical pesticides. Likewise, proper management of agricultural landscapes can contribute to climate change mitigation by increasing carbon sequestration in the soil and reducing greenhouse gas emissions (Maluf, 2021; Otálora & Vivas, 2017).

Hence, the dialogues between Ecological Economics and Agrosciences are evidenced in the holistic management of natural resources in agriculture (Barbosa & Gómez, 2021; Leewuis, 2004). The long-term viability of agricultural systems crucially depends on sustainable management of soil, water, and biodiversity. In this context, Ecological Economics provides tools for assessing resource utilization efficiency and designing policies that promote conservation and sustainable use of natural resources in agriculture (Casas et al., 2017; Carballido, 2013).



Volumen 2. Número 2. Julio - Diciembre 2025
ISSN: 3028-4546 (En línea)

Furthermore, the convergence between Ecological Economics and Agrosciences is manifested in the exploration of resilient and adaptable agricultural production systems to climate change (Gómez, 2020; Cárdenas et al., 2016). Climate change poses significant challenges for agriculture, such as climate variability, rising temperatures, and increased frequency of extreme weather events. In this regard, Agrosciences develop more resistant and adaptable cultivation techniques, while Ecological Economics provides risk analysis and adaptation strategies based on sustainable management of natural resources (Correa, 2017; Benavides, 2017).

Therefore, this article aligns with the postulates of (Gómez et al., 2023; Kalmanovitz & López, 2006; De Souza Santos, 2011) when they affirm that it is crucial to consider the economic and social aspects associated with the adoption of more sustainable agricultural practices. Many conventional farmers face economic and financial barriers to transitioning to more sustainable agricultural systems due to significant initial investments required and potential impacts on short-term yields. Consequently, the implementation of economic incentive policies and support programs is necessary to facilitate the adoption of sustainable agricultural practices, such as subsidies for soil conservation techniques, financing for crop diversification, and access to markets that value sustainable production (Maldonado, 2021; Martínez Alier, 2011). In summary, from an environmental perspective, modern agriculture faces considerable challenges related to soil degradation, water pollution, loss of biodiversity, and climate change (Vargas & Rojas, 2022; Naredo, 2006). Integrating Ecological Economics principles into agricultural decision-making and associated policies can help mitigate these negative impacts and promote conservation and regeneration of natural resources (Orihuela, 2019; Solano, 2007).

## Conclusions

The relationship between ecological economics and agrosciences is essential for addressing the complex challenges facing agriculture and natural resource management in the 21st century. By integrating economic and scientific approaches, we can promote more sustainable,



Volumen 2. Número 2. Julio - Diciembre 2025
ISSN: 3028-4546 (En línea)

equitable, and resilient agricultural systems that meet present needs without compromising the ability of future generations to meet theirs. This multidisciplinary collaboration is fundamental for addressing the current and future challenges of agriculture and sustainable development.

The loss of biodiversity in intensive agricultural systems requires a holistic approach that combines scientific knowledge, sustainable agricultural practices, and appropriate policies. By integrating principles of ecological economics into the planning and management of agricultural systems, it is possible to promote the coexistence of agricultural production and biodiversity conservation, thus ensuring the long-term sustainability of agriculture and the environment. This integrated approach is crucial for preserving agricultural biodiversity and ecosystem services that support food production.

Mitigating soil degradation and resource depletion in conventional agriculture requires a comprehensive approach that combines scientific knowledge, sustainable agricultural practices, and appropriate policies. By applying approaches based on ecological economics, it is possible to promote the adoption of more sustainable agricultural practices that conserve and improve soil quality, as well as ensure the availability of resources for future generations. This not only benefits the environment and biodiversity but also contributes to the resilience and long-term viability of agricultural systems, ensuring their ability to sustainably produce food in the future.

## References

Aguilera, M., Rincón, M., & Gómez, D. (2020). Bioeconomía, una alternativa de investigación en administración y afines. En M. Aguilera-Prado y M. Rincón-Moreno (eds.). Temas y métodos de investigación en negocios, administración, mercadeo y contaduría (pp. 193-218). Bogotá: Editorial Uniagustiniana. Doi: https://doi.org/ 10.28970/9789585498426.06

Altieri, M., Nicholls, C., Henao, A., & Lana, M. (2015). Agroecology and the design of climate change-resilient farming systems. *Agronomy for Sustainable Development*, 35, 869–890. https://doi.org/10.1007/s13593-015-0285-2

Arias, M. (2021). La agroecología: Una alternativa a la crisis ambiental en Colombia. *Revista Internacional de Ciencias Sociales Interdisciplinares* 10 (1): 49-64. https://doi.org/10.18848/2474-6029/CGP/v10i01/49-64

Barbosa, E., & Gómez, D. (2021). Economía solidaria y construcción de paz. Revista Sur. https://www.sur.org.co/economia-solidaria-y-construccion-de-paz/

Barbosa, E., Vargas, H., & Gómez, D. (2020). Breve estudio bibliométrico sobre economía solidaria. *Cooperativismo & Desarrollo*, 28(118), 1-20. https://revistas.ucc.edu.co/index.php/co/article/view/3723

Benavides, D., (2017). Conexiones de la salud global. Ediciones Unisalle. DOI: https://doi.org/10.19052/9789585400696.

Bensman, S., & Leydesdorff, L. (2009). Definition and identification of journals as bibliographic and subject entities: Librarianship versus ISI Journal Citation Reports methods and their effect on citation measures. *Journal of the American Society for Information Science and Technology.* 60 (6), 1097–1117.

Berdegué, J., et al. (2012). Desarrollo territorial rural en América Latina: determinantes y opciones de política. En: Berdegué, J.A. y F. Modrego (eds.). De Yucatán a Chiloé: dinámicas territoriales en América Latina. Buenos Aires, Editorial Teseo.

Blanco, J. (2007). Espacio y territorio: elementos teórico-conceptuales implicados en el análisis geográfico, en M. A. Fernández y R. Gurevich (Coords.), Geografía. Nuevos temas, nuevas preguntas. Un temario para su enseñanza. Buenos Aires, Argentina: Biblios.

Camacho, M., Rojas, J., & Santillán, A. (2023). Análisis bibliométrico de la producción científica sobre cooperativas agropecuarias en países hispanoparlantes. Cooperativismo & Desarrollo, 31(126), 1-24. https://doi.org/10.16925/2382-4220.2023.02.01

Carrizo, G. (2000). Hacia un concepto de bibliometría. *Revista de Investigación Iberoamericana en Ciencia de la Información y Documentación,* 1(2), 1-10.

Casas, A., Torres, I., Delgado Lemus, A., Rangel Landa, S., Ilsley, C., Torres Guevara, J., Cruz, A., Parra, F., Moreno Calles, A. I., Camou, A., Castillo, A., Ayala Orozco, B., Blancas, J. J., Vallejo, M., Solís, L., Bullen, A., Ortíz, T., y Farfán, B. (2017). Ciencia para la sustentabilidad: investigación, educación y procesos participativos. *Revista mexicana de biodiversidad*. https://doi.org/10.1016/j.rmb.2017.10.003.

Castro, L., Rincón, M., & Gómez, D. (2017). Educación para la salud: una mirada desde la antropología. *Revista Ciencias de la Salud,* 15(1), 145-163. https://revistas.urosario.edu.co/index.php/revsalud/article/view/5387

Cárdenas. D., & Vallejo, C. (2016). Agricultura y desarrollo rural en Colombia 2011-2013: una aproximación. *Apuntes de Cenes,* 35(62), 87-123. https://doi.org/10.19053/22565779.4411

Caravani, A., García, M., & Aznar, A. (2017). El desarrollo rural y la economía verde como instrumentos de lucha contra el cambio climático: un análisis en la Comunidad Valenciana (España). *Economía Agraria y Recursos Naturales*, 17(2), 179-209.

Carballido, D. (2013). Concepto de territorio: ¿arma de distracción masiva? Didáctica y Prácticas docentes. Diplomado en Curriculum y Prácticas escolares en Contexto (Flacso).

Correa, G., Suárez, K.V., Obregón, N., De Armas Costa, R.J., Martín, P.F., Serna, Y.B., González, R., Rendón, J.A., y Gómez, D.T., 2022. Las agrociencias en la dimensión de paisajes sostenibles. Ediciones Unisalle. DOI: https://doi.org/10.19052/9786287510326.

Correa, F. (2017). Desarrollo sostenible. Revisión teórica desde la economía Medellín: Colombia. Ediciones UNAULA.

Chacón, L., (2021). Las agrociencias como soporte a una producción agropecuaria sostenible. Ediciones Unisalle. DOI: https://doi.org/10.19052/9789585148963

Chacón, L., (2020). Competitividad e innovación. Ediciones Unisalle. DOI: https://doi.org/10.19052/9789585136748.

Dematteis, G., & Governa, F. (2005). Territorio y territorialidad en el desarrollo local. La contribución del modelo slot. Boletín de la A.G. E. (39), 31-58. https://dialnet.unirioja.es/servlet/articulo?codigo=1161234

Departamento Nacional de Planeación. (2016). Crecimiento verde para Colombia: Elementos conceptuales y experiencias internacionales. Bogotá.

De Souza Santos, B. (2011). Producir para vivir. Los caminos de la producción no capitalista. México d. f., México: Fondo de Cultura Económica.

Deller, S.; Lamie, D. y Stickel, M. (2017). Local Foods Systems and Community Economic Development. *Community Development*, 48(5), 612-638. DOI:10.1080/15575330.2017.1373136.

Escobar, A. (2011). Epistemologías de la naturaleza y colonialidad de la naturaleza. Variedades de realismo y constructivismo Arturo Escobar. En L. Montenegro (Ed.). Cultura y Naturaleza Aproximaciones a propósito del bicentenario de la independencia de Colombia (pp. 49-75). Jardín Botánico de Bogotá, José Celestino Mutis.

Escobar, A. (2018). Otro posible es posible: Caminando hacia las transacciones desde Abya Yala / Afrolatino a américa. Bogotá, Colombia: Ediciones des Abajo.

Escobar, A. (2015). Sentipensar con la Tierra: Las Luchas Territoriales y la Dimensión Ontológica de las Epistemologías del Sur. AIBR. *Revista de Antropología Iberoamericana,* 11(1), 11 – 32

FAO. (2022). El estado de la seguridad alimentaria y la nutrición en el mundo 2022. https://www.fao.org/documents/card/es/c/cc3017es

FAO & CEPAL (2021). Sistemas alimentarios y COVID-19 en América Latina y el Caribe. Como fortalecer los sistemas alimentarios urbanos. Boletín 19. Santiago. FAO y CEPAL. https://www.cepal.org/es/publicaciones/45924-sistemas-alimentarios-covid-19- america-latina-caribe-ndeg-12-comportamiento

FAO. (2018). Transformar la alimentación y la agricultura para alcanzar los ODS: 20 acciones interconectadas para guiar a los encargados de adoptar decisiones. Roma. http://www.fao.org/3/i9900es/I9900ES.PDF

FAO. (2019). El estado mundial de la agricultura y la alimentación. Progresos en la lucha contra la pérdida y el desperdicio de alimentos. Roma. http://www.fao.org/3/ca6030es/ca6030es.pdf

Forero, J. (2010). Economía campesina, pobreza, tierra y desplazamiento en Colombia. En Forero Álvarez, J. (Ed.), El campesino colombiano, entre el protagonismo económico y la indiferencia de la sociedad. (pp. 69-119). Bogotá, Colombia: Editorial Javeriana.

Forero, J. (2009). Conformación productiva de los territorios rurales. Reflexiones a propósito de la ponencia del profesor Tulet. En J. Ferro & F. Lozano (Eds.), Las configuraciones de los territorios rurales en el siglo XXI. (pp. 231-240.) Bogotá, Colombia; Editorial Javeriana.

Gandulfo, A. y Rofman, A. (2020a). Sistemas locales de producción y consumo de alimentos saludables. *Revista de Ciencias Sociales, Segunda época,* 11(37),63-82.

Garzón, B., Barbosa, E., & Gómez, D. (2023). Las organizaciones comunales como gestoras de reactivación económica: mercados campesinos solidarios en el municipio el Playón, Santander. *CIRIEC Colombia*. (1),245-257.

Garzón, B., Barbosa, E., & Gómez, D. (2022). Política pública en la pandemia desde la economía solidaria: circuitos cortos de comercialización-C.C.C. en Colombia (2020- 2021). *Apuntes De Economía Y Sociedad*, 3(1), 25–36. https://doi.org/10.5377/aes.v3i1.14287

Giraldo, O. (2018). Ecología política de la agricultura. Agroecología y posdesarrollo. - San Cristóbal de Las Casas, Chiapas, México: El Colegio de la Frontera Sur.

Gliessman, S. (2017). Agroecología para la Seguridad Alimentaria y Nutrición. En Actas del Simposio Internacional de la FAO. http://www.fao.org/3/a-i4729s.pdf

Gómez, D. (2024a). La producción de alimentos para autoconsumo. *Revista Multidisciplinaria Voces De América Y El Caribe,* 1(I), 52-79. https://doi.org/10.5281/zenodo.10795207

Gómez, D. (2024b). Trends in Research: Bioculture, Social Metabolism and Territory in the 21st Century. *SCTProceedings in Interdisciplinary. Insights and Innovations*, 2, 246. https://doi.org/10.56294/piii2024246

Gómez, D., & Aguirre, M. (2023). Seguridad alimentaria y desarrollo rural en 5 municipios del departamento del Caquetá, Colombia. Periodo 2018-2022. *Población y Desarrollo*.29: (57), 75-93. http://scielo.iics.una.py/scielo.php?script=sci_arttext&pid=S2076-054X2023005700075

Gómez, D., Barbosa, E., & Téllez, C. (2023). Política pública en Colombia: La innovación social como estrategia de la Economía solidaria (2018-2022). En: INOVACIÓN SOCIAL y PÚBLICA Experiencias y aproximaciones a la complejidad contemporánea. Editorial Universidad de Chile. Santiago de Chile: Chile.

Gómez, D., & Barbosa, E. (2023). Agroecología y circuitos cortos de comercialización: Enfoques en diálogo con la naturaleza. *Cooperativismo & Desarrollo*, 31(125), 1–19. https://doi.org/10.16925/2382-4220.2023.01.02

Gómez, D. (2022). Metabolismo social de la agroindustria de la palma de aceite en el territorio de Aracataca Magdalena Colombia (1965-2018). Facultad de Ciencias Agropecuarias. Doctorado en agrociencias. Tesis doctoral. Universidad de la sale. Bogotá: Colombia.https://ciencia.lasalle.edu.co/doct_agrociencias/14

Gómez, D., Barbosa, E., & Laverde, M. (2021). Los circuitos cortos de comercialización y la democracia directa en los territorios. Apuntes desde la economía solidaria. *Inclusión y Desarrollo*, 9(1), 3-12. https://revistas.uniminuto.edu/index.php/IYD/article/view/2918

Gómez, D., Laverde, M. & Barbosa, E. (2021). Short Commercialization Circuits in Local Supply Chains: Economic Revival in the Pandemic. *South Asian Journal of Social Studies and Economics,* 12(2), 1-10. https://doi.org/10.9734/sajsse/2021/v12i230299

Gómez, D., Aldana, K., & Rodríguez, M. (2021). Antropologías del desarrollo, enfoques alternativos y posdesarrollo. Breve revisión de conceptos y apuntes críticos. *Población & desarrollo*.27:(52),108-122 https://revistascientificas.una.py/index.php/RE/article/view/957

Gómez, D. (2020). Sostenibilidad: apuntes sobre sostenibilidad fuerte y débil, capital manufacturado y natural. IyD, 8:(1), 131–143. https://doi.org/10.26620/uniminuto.inclusion.8.1.2021.131-143

Gómez, D., Ariza, E., y Velasco, N. (2018). Diálogos entre la economía ecológica y la bioeconomía, Editorial Universidad de San Buenaventura, Bogotá.

Gómez, D., Carranza, Y., & Ramos, C. (2016). Revisión documental, una herramienta para el mejoramiento de las competencias de lectura y escritura en estudiantes universitarios. *Chakiñan, Revista de Ciencias Sociales y Humanidades.* (1) 46-56. https://dialnet.unirioja.es/servlet/articulo?codigo=6294862

Guzmán, G., González de Molina, M. & Alonso, A. (2011). The land cost of agrarian sustainability. An assessment. Land Use Policy 28(4), 825-835. https://doi.org/10.1016/j.landusepol.2011.01.010

Hale, J., Legun, K., Campbell, H., y Carolan, M. (2019). Social sustainability indicators as performance, Geoforum, 103, 47–5. https://doi.org/10.1016/j.geoforum.2019.03.008

Kalmanovitz, S. (2019). Nueva historia económica de Colombia. Penguin Random House Grupo Editorial SAS. Bogotá: Colombia.

Kalmanovitz, S. & López, E. (2006). La agricultura colombiana en el siglo XX. Bogotá, D. Colombia: Banco de la República

Llanos, L. (2010). El concepto del territorio y la investigación en las ciencias sociales. *Agricultura, sociedad y desarrollo*. 7: (3), 207-220. www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1870-54722010000300001#:~:text=El%20territorio%20es%20un%20concepto,concepto

Leff, E. (2010). Globalización, ambiente y sustentabilidad. Saber Ambiental, 6a edición. México: Siglo XXI Editores. http://www.otrodesarrollo. com/desarrollosostenible/LeffAmbienteGlobalizacion. Pdf

Leewuis, C. (2004). Communication for rural innovation. Rethinking agricultural extension. Oxford, UK: Blackwell Science.

López, C., Gómez, D., & Santana, L. (2025). Evolución de la administración de empresas: un análisis bibliométrico desde la perspectiva de la dinámica empresarial global. *RAN - Revista Academia & Negocios* , *11* (1), 1-14. https://doi.org/10.29393/RAN11-10EALR30010

Maldonado C. (2023). La bioeconomía como un enfoque de complejidad y crítico de la función de producción. En Rincón-Ruiz A. (Ed). 2023. Bioeconomía: Miradas múltiples, reflexiones y retos para un país en crisis estructural. Un libro sobre economías diversas, y economías “otras” para la vida. Centro Editorial – Facultad de Ciencias Económicas. Universidad Nacional de Colombia.

Maldonado, C. (2021). Las organizaciones inteligentes son organizaciones que saben de complejidad. *Revista Ciencias de la Complejidad*, 2(1), 81–92. https://doi.org/10.48168/cc012021-008

Maldonado, C. (2018). Bioeconomía, Biodesarrollo y civilización. Un mapa de problemas y soluciones. En Epistemologías del Sur para germinar alternativas de desarrollo. Debate entre Enrique Leff, Carlos Maldonado y Horacio Machado (pp. 57-81). Editorial Universidad del Rosario.

Maldonado, C. (2017). La extraña idea del desarrollo. Genealogía de un concepto. *Pensamiento Americano,* 144-160.

Maldonado, C. (2014). Biodesarrollo y complejidad. Propuesta de un modelo teórico. En M. Eschenhaguen, Un viaje por las alternativas al desarrollo: perspectivas y propuestas teóricas (71-94). Bogotá: Universidad del Rosario.

Maluf, R. (2021). Decentralized Food Systems and Eating in Localities: A Multi-Scale Approach. *Revista de Economia e Sociologia Rural*, 59(4), e238782. https://doi.org/10.1590/1806- 9479.2021.238782

Martínez Alier, J. (2015). Ecología política del extractivismo y justicia socioambiental. Interdisciplina. 3:(7), 57-73. http://dx.doi.org/10.22201/ceiich.24485705e.2015.7.52384

Martínez Alier, J. (2011). Macroeconomía ecológica, metabolismo social y justicia ambiental. RHA. (9), 149-168. https://historiaactual.org/Publicaciones/index.php/rha/article/view/745

Martínez, S., Hand, M., Da Pra, M., Pollack, S., Ralston, K., Smith, T. & Newman, C. (2010). Local Food Systems: Concepts, Impacts, and Issues. Economic Research Report 97. US

Department of Agriculture, Economic Research Service. https://www.ers.usda.gov/webdocs/publications/46393/7054_err97_1_.pdf? v=42265

Miró, Ò., & Burbano, P. (2013) El factor de impacto, el índice h y otros indicadores bibliométricos. *Anales Sis San Navarra*, 36(3), 371-377

Moulaert, F., & Ailenei, O. (2005). Social economy, third sector, and solidarity relations: A conceptual synthesis from history to present. *Urban Studies*, 42(11), 2037-2053. https://www.jstor.org/stable/43197222

Mora, S. B. (2012). Las empresas del sector agropecuario: racionalidad económica y gestión. *AD-minister*, (21), 87-99. http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S1692-02792012000200006&lng=en&tlng=es

Naredo, J. (2006). Raíces económicas del deterioro ecológico y social. Más allá de los dogmas. Barcelona, España: Siglo XXI Editores, S. A.

Organización para la Cooperación y el Desarrollo Económico-OECD. (2020). How's Life? 2020: Measuring Well-being, OECD Publishing, Paris. https://doi.org/10.1787/9870c393

OECD (2019). Measuring Distance to the SDG Targets 2019: An Assessment of Where OECD Countries Stand. https://doi.org/10.1787/a8caf3fa

Organización de las Naciones Unidas- ONU, (2020). The Sustainable Development Goals Report 2020. Obtenido en: https://unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf

Orihuela, M. (2019). Territorio: un vocablo, múltiples significados. AREA, 25(1), 1-16. https://www.area.fadu.uba.ar/wp-content/uploads/AREA2501/2501_orihuela.pdf

Otálora, A, & Vivas, O. (2017). La localidad como factor de desarrollo en la ruralidad. En Cuadernos de seminario 7. Agrociencias y territorio. Editor Correa, G. Doctorado en Agrociencias editorial: Universidad de la Salle. Bogotá: Colombia.

Paramo, P. (2008). La Investigación en las Ciencias Sociales. Técnicas de recolección de Información.: Bogotá, Colombia: Universidad Piloto de Colombia.

Pavone, V. (2012). Ciencia, neoliberalismo y bioeconomía. Revista Iberoamericana de Ciencia, Tecnología y Sociedad, 145-161. https://www.redalyc.org/pdf/924/92424169013.pdf

Purvis, B., Mao, Y. and Robinson, D. (2019). Three pillars of sustainability: in search of conceptual origins. *Sustainability Science*, 14(3), 681–695. https://doi.org/10.1007/s11625-018-0627-5

Rastoin, J. (2015). Les systèmes alimentaires territorialisés: considérations théoriques et justifications empiriques. Économies et Sociétés, 8, 1155-1164. *Revista Internos*. https://www.persee.fr/doc/esag_2275-2919_2015_num_49_837_1802

Rendón, J., & Gómez, D. (2022). Paisaje, territorio y agroindustria. El caso de la palma de aceite en Aracataca Magdalena Colombia. En Cuadernos de Seminario: Las Agrociencias en la dimensión de paisajes sostenibles. Número 13 Ediciones. Unisalle Bogotá: Colombia.

Rendón, J., & Gómez, D. (2020). Circuitos cortos y verdes. Alimentos si hay. Revista sur.: https://www.sur.org.co/circuitos-cortos-y-verdes-alimentos-si-hay/

Rendón, J. (2017). Pensar la economía en torno a la naturaleza. Prologo. En: Desarrollo sostenible. Revisión teórica dese a la economía. Ediciones UNAULA. Medellín: Rendón, J. (2017). Economía y nueva ruralidad. En G. Correa, Agrociencias y territorio (págs. 35- 50). Bogotá: Editorial Universidad de la Salle. Colombia.

Rincón, H., & Gómez, D. (2023). Cambio y aprendizaje organizacional, revisión documental. *Revista CIES*.14: (2),27-49. https://revista.escolme.edu.co/index.php/cies/article/view/464

Reyes, G. (2016). Agrociencias y empresas del agro: condiciones y perspectivas en América Latina. En Cuadernos de seminario 4. Agrociencias en contexto. Compilador Ardila, A. Doctorado en Agrociencias. Editorial Universidad de la Salle. Bogotá: Colombia.

Rodríguez, D. (2025). Convergencias y desafíos entre la economía ecológica y el ecofeminismo: Hacia un modelo económico sostenible e inclusivo. *Revista Internacional de Investigación y Estudios Científicos Innovadores* , *8* (2), 499–505. https://doi.org/10.53894/ijirss.v8i2.5201

Rodríguez, D. (2025). Rescatando y socializando saberes ancestrales: el "Guineo Paso" en Aracataca y Ciénaga, Magdalena, Colombia. *Revista De Gestão Social E Ambiental* , 19 (4), e011965. https://doi.org/10.24857/rgsa.v19n4-073

Rodríguez, D. (2024). Perfil Metabólico del "Guineo Paso" Aracataca Magdalena Colombia. *Revista De Gestão Social E Ambiental* , 18 (10), e08748. https://doi.org/10.24857/rgsa.v18n10-290

Rodríguez, H., Ramírez, C., & Restrepo, L. (2018). Factores Determinantes de la Sostenibilidad de las Agroempresas Asociativas Rurales. *Revista de Economía e Sociología Rural, 56*(1), 107-122. https://www.scielo.br/j/resr/a/hsgzkQ3JfVzGf8LwqBqmssP/?lang=es

Rodríguez, H., Ramírez, C., & Restrepo, L. (2016). Nuevas tendencias de la extensión rural para el desarrollo de capacidades de autogestión. *Corpoica cienc. tecnol. agropecu, 17*(1), 31-42. https://revistacta.agrosavia.co/index.php/revista/article/view/457

Rodríguez, D., Laverde, M., & Pérez, E. (2021). Short Commercialization Circuits in Local Supply Chains: Economic Revival in the Pandemic. *South Asian Journal of Social Studies and Economics*, 12:(2), 1-10. https://doi.org/10 .9734/sajsse/2021/v12i230299

Rodríguez, D. F., Páez, Ángel E., Román, D., & Rodríguez, E. (2024). Participación ciudadana, gobernanza democrática y derecho al desarrollo: una revisión sistemática. *Telos:*

*Revista De Estudios Interdisciplinarios En Ciencias Sociales,* 26(1), 198-214. https://doi.org/10.36390/telos261.13

Rojas, I., & Daly, C. (2019). Gestión participativa de capacidades para fomentar la producción agrícola ecoamigable en la comunidad escolar de Golfito en Cureña de Sarapiquí. En Sánchez, N. y Flores, M. (Comp.), Sistematización de experiencias: Desde el enfoque de gestión de capacidades, 97-112.

Rosas-Baños, M. (2012). Economía Ecológica y solidaria: rumbo a una propuesta teoría integrada que se visualice las rutas hacia la transición. *Revista Iberoamericana de Economía Ecológica*,18: 89-103. https://www.raco.cat/index.php/Revibec/article/view/253533

Rushforth, A. (2016). All or nothing? Debating the role of evaluative bibliometrics in the research system. *Research Evaluation*, 25(2), 230-231. https://doi.org/10.1093/reseval/rvw004

Sachs, J., Schmidt-Traub, G., Kroll, C., Lafortune, G., Fuller, G., Woelm, F. (2020). The Sustainable Development Goals and COVID-19. Sustainable Development Report 2020. Cambridge: Cambridge University Press.

Salas, W. (2012). Diseño de un modelo de análisis de sostenibilidad de políticas públicas en salud. Tesis doctoral. Universidad Politénica de Cataluña.barceloan: España. https://www.tdx.cat/handle/10803/101396

Sánchez. A., & Herrera, E. (2017). Desarrollo Rural Local: Un enfoque de desarrollo para el reconocimiento de la diversidad rural y los actores locales. Tesis de Maestría. Universidad de la Salle. http://repository.lasalle.edu.co/bitstream/handle/10185/21359/72121216_2017.pdf?sequence=1&isAllowed=y

Silva, L. (2016). Seguridad, territorio, población. Revista INVI, 24(66). https://www.redalyc.org/pdf/598/59820678009.pdf

Solano, Y. (2007). Participación de las mujeres en la construcción social del territorio y el proceso de regionalización del Caribe colombiano. *Territorios*, (16-17), 71-90. https://revistas.urosario.edu.co/index.php/territorios/article/view/846

Sonnino, A. (2011). Biodiversidad y biotecnologías: el eslabón estratégico. V. Ivone (ed.) Biodiversidad, Biotecnología y Derecho. Un crisol para la sustentabilidad. Page 299-320., Roma, Italia: Aracne editrice. http://www.fao.org/docrep/article/am323s.pdf

Trigo, E. J., Henry, G., Sanders, J., Schurr, U., Ingelbrecht, I., Revel, C., Santana, C. y Rocha P. (2013). Bioeconomy Working Paper No. 2013-01. https://www.researchgate.net/publication/273761114_Towards_bioeconomy_development_in_Latin_America_and_the_Caribbean

Torrens, J. (2017). Hacia un desarrollo territorial incluyente. Cuadernos de Trabajo sobre Inclusión.

Varela, D. (2017). Política de tierras en el marco del desarrollo rural con enfoque territorial y el posconflicto. En G. Correa, Agrociencias y territorio (págs. 99-134). Bogotá: Editorial Universidad de la Salle.

Vargas, A., & Rojas, J.E., (2022). Territorio, equidad y desarrollo. Ediciones Unisalle. DOI: https://doi.org/10.19052/9786287510456

Vanegas, J. (2017). Sustentabilidad agrícola en el desarrollo territorial. En Cuadernos de seminario 7. Agrociencias y territorio. Editor Correa, G. Doctorado en Agrociencias editorial: Universidad de la Salle. Bogotá: Colombia.

Vergara, W. (2020). Derechos de propiedad agraria, concentración de la tierra y productividad agrícola en Colombia. Facultad de Ciencias Agropecuarias. Tesis doctoral de Agrociencias. Universidad de la Salle.https://ciencia.lasalle.edu.co/cgi/viewcontent.cgi?article=1009&context=doct_agrocienc ias

Vergara, W. (2017). Tierra y territorio en las historias del conflicto. En Cuadernos de seminario 7. Agrociencias y territorio. Editor Correa, G. Doctorado en Agrociencias editorial: Universidad de la Salle. Bogotá: Colombia.

World Bank. (2006). Enhancing Agricultural Innovation: How to Go beyond the Strengthening of Research Systems. World Bank: Washington, D.C.