

Innovation and Bioeconomy Program



Inter-American Institute for Cooperation on Agriculture

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Table of Contents

- Acronyms..... 3
- About IICA..... 4**
- Why is the bioeconomy a strategic commitment for Latin America and the Caribbean (LAC)?..... 6
- IICA’s proposal to promote the use of the bioeconomy in LAC..... 10
 - Knowledge management regarding the opportunities that the bioeconomy can offer to agri-food systems and rural territories..... 11
 - Strengthening technical, managerial and organizational capacities for the promotion and use of the bioeconomy..... 12
 - Support for the formulation and implementation of strategies, policies, standards and regulations for the promotion of the bioeconomy. 13
 - Promotion of investments, businesses and ventures in the bioeconomy..... 13
- Coordination center for bioeconomy innovation and ventures. 14**
 - Positioning of LAC in the main global bioeconomy forums and promotion of regional networks for south-south cooperation. 15
 - Strengthening national capacities to take advantage of knowledge and new STI of the bioeconomy. 16
 - Innovation as the cornerstone for strengthening and transforming agri-food systems. ... 17
- Work dynamics and links of the Program 18**
 - Networks and coalitions for the advancement of the bioeconomy within the framework of a continental alliance. 19
- IICA's experience in promoting the bioeconomy in LAC..... 20**
- Bibliography..... 22



Acronyms

LAC	Latin America and the Caribbean
STI	Science, technology and innovation
FONTAGRO	Regional Fund for Agriculture Technology
IICA	Inter-American Institute for Cooperation on Agriculture
R+D	Research and Development
MTP	Medium-Term Plan
ICT	Information and communication technologies

About IICA

The Inter-American Institute for Cooperation on Agriculture (IICA), established in 1942, is the specialized agricultural agency of the Inter-American System that supports the efforts of its Member States to achieve agricultural development and rural well-being. The Institute promotes hemispheric cooperation aimed at achieving a more competitive, inclusive and sustainable agricultural sector, capable of feeding the region and the world.

IICA works together with its member countries to identify their needs and demands for technical cooperation, in order to provide the most appropriate responses to these demands through knowledge management led by its specialized technical experts, in coordination with hemispheric programs and the participation of partner institutions and professional networks of recognized prestige.

The Institute's operations are aimed at the implementation of three strategic technical cooperation actions:

- Support the strengthening and transformation of agri-food systems, in accordance with the mandate of the Inter-American Board of Agriculture expressed in resolution 531, in which it endorses the 16 messages presented by the Americas at the United Nations Food Systems Summit of 2021.
- Provide tools and inputs that contribute to the formulation of a new generation of public policies aimed at recognizing the contribution of agriculture in agri-food systems and in solving the climate crisis, as well as addressing science and innovation issues, placing agricultural and livestock producers of all contexts and scales at the center; and
- Support the collective action efforts of member countries in areas linked to their institutional mandate.
-

To this end, the new Medium-Term Plan (MTP) established the creation of a new integrating body called the Observatory of Public Policies for the Transformation of Agri-Food Systems. The Observatory carries out cross-cutting actions in all areas of the MTP, and operates in coordination with the Coalition to Build Capacities for the Transformation of Agri-Food Systems, whose objective is to mobilize political, social, financial and technical support between national, regional and global entities with common and complementary objectives, in order to contribute to the development of leadership capabilities, and to the promotion and management of innovation, required to foster the evolution of the agri-food systems of the Americas.

Furthermore, the programs were adjusted to adequately reflect the emerging issues of the new global scenarios and priorities. IICA currently has the following hemispheric programs:

- Innovation and Bioeconomy
- Territorial Development and Family Farming
- International Trade and Regional Integration
- Agricultural Climate Action and Sustainability
- Agricultural Health, Safety and Agri-food Quality
- Digitalization of Agrifood Systems
- Gender Equality and Youth

The seven programs act in a coordinated manner and with an interdisciplinary approach to ensure the provision of articulated responses to the challenges faced by the 34 Member States of the Institute.

Through these changes, we seek to continue consolidating the vision of an IICA that looks outward to the world from the Americas and that, through its network of national delegations and its various regional and subregional technical cooperation mechanisms, provides member countries with technical cooperation of excellence, offering real solutions to the Ministries of Agriculture of the Americas.

Why is the bioeconomy a strategic commitment for Latin America and the Caribbean (LAC)?

Because the current context requires us to be more competitive, sustainable and inclusive.

For more than two decades, LAC has witnessed a decline in its economic growth, employment and food security indicators, while the impacts of climate change and the deterioration of natural resources have increased. Furthermore, in the last 5 years it has suffered the health, humanitarian and economic consequences not only of the coronavirus pandemic, but also of the war between Russia and Ukraine (IICA, et al. 2023, UN 2023).

With respect to agri-food systems, the situation is similar. Although agriculture in LAC has shown leadership and prominence in several international markets, within the countries and territories there continue to be large gaps in terms of efficiency and productivity (value addition, yields, losses and waste), social inclusion (opportunities in the rural territories) and environmental sustainability (emissions, pollution, impact on natural resources and climate vulnerability).

To respond to these economic, social and environmental needs, LAC must urgently build a productive model to promote the competitiveness of its industries (generating new jobs and income, especially in rural territories), while contributing to compliance with the decarbonization and environmental resilience goals.

Illustration 1. Contributions of the bioeconomy to the strengthening and transformation of agri-food systems in LAC.



Source: Developed based on Trigo *et al.* 2023.

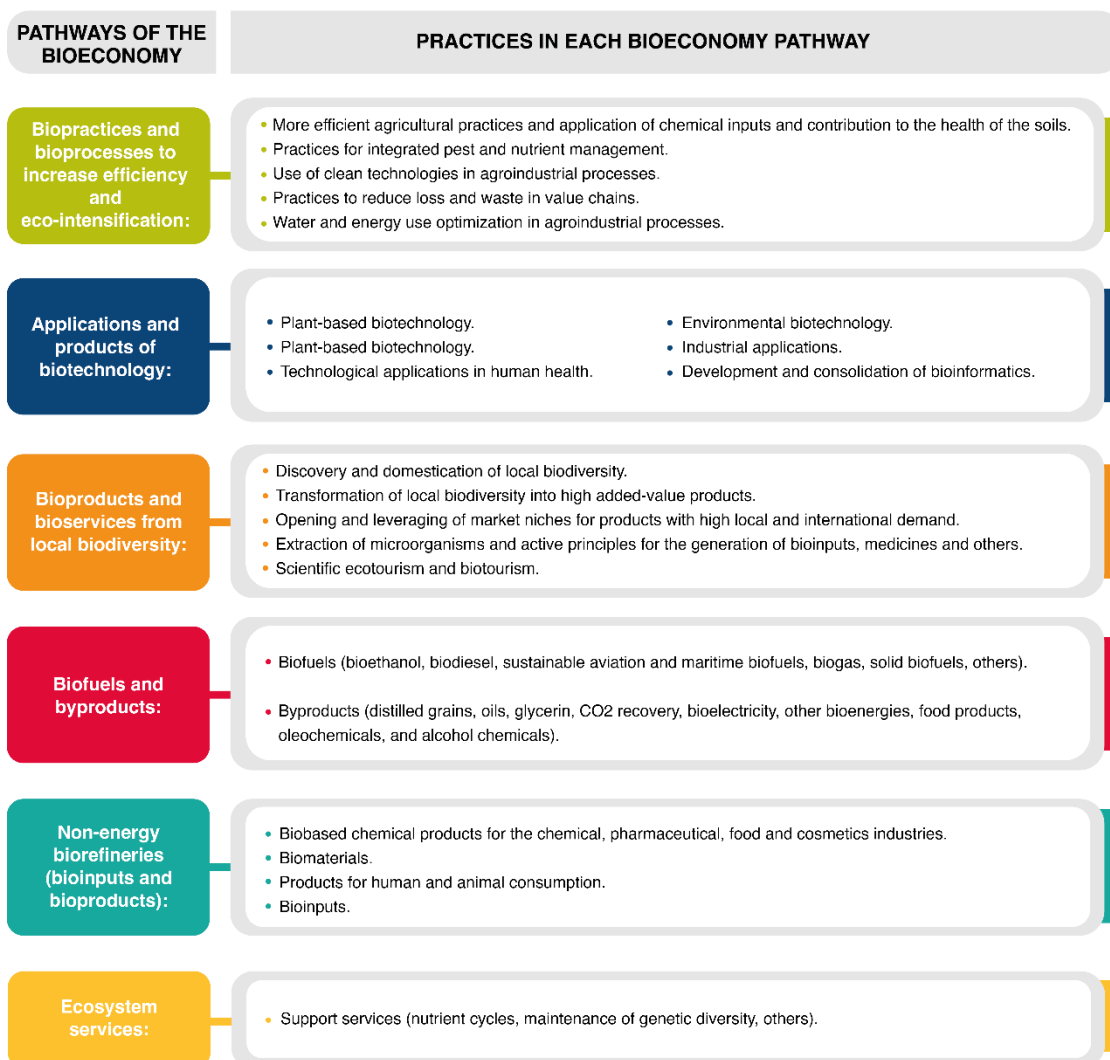
Because the bioeconomy allows us to harness the comparative advantages within a new productive model.

The bioeconomy is internationally defined as “the production, utilization and conservation of biological resources, including related knowledge, science, technology, and innovation, to provide information, products, processes and services across all economic sectors aiming toward a sustainable economy” (Office of the Bioeconomy Council, 2018). In more practical and operational terms, as explained in detail in IICA et al (2023), the bioeconomy can be understood as:

A technical-productive approach that starts by leveraging new technical-scientific developments, as well as the convergence between biology, chemistry, engineering, physics, information and communication technologies (ICT), artificial intelligence (AI), etc., to maximize the value of biomass (agriculture, forests, livestock, fishing, waste, etc.) and biological principles (photosynthesis, fermentation, digestion, pigmentation, etc.) in the production of new bioproducts and bioservices intended not only for the agricultural and food industry (as LAC has historically done), but also to other industries with high added value and accelerated growth in national and international markets (such as the industries related to energy, cosmetics, medicine, chemistry, construction, fashion, tourism, remediation, environmental services, etc.).

Illustration 2. Pathways and practices of the bioeconomy in LAC¹.

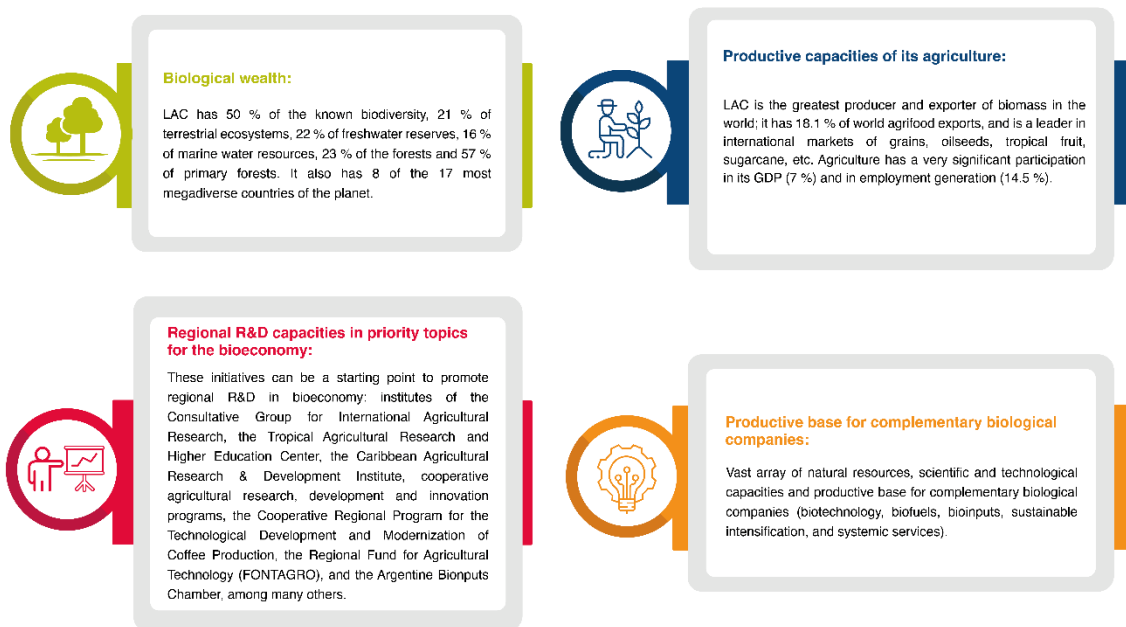
¹ The information included in this table is based on the review and adjustment of the bioeconomy pathways developed by Chavarría et al. (2019). appearing in table 1: Pathways to leverage the bioeconomy.



Source: Chavarría, *et al.* (2019).

Although it was in Europe almost 40 years ago where the conceptual and political approaches to the bioeconomy emerged, it is in LAC that has the greatest comparative advantages for its use.

Illustration 3. Strengths of LAC in the promotion and leveraging of the bioeconomy.



Source: Created based on ECLAC *et al.* 2019.

IICA's proposal to promote the use of the bioeconomy in LAC

The bioeconomy of LAC has matured significantly since the implementation of the 2018–2022 MTP. Today, not only is the discussion on bioeconomy more positioned on the agenda of decision-makers, but also several countries in the region are advancing in their public policy management processes. In addition, various public and private initiatives promote scientific and productive advances in the main pathways of the bioeconomy.

This progress in the discussions and initiatives related to the bioeconomy in LAC also requires greater maturity in the approach of the program developed by the Institute, in terms of 1) the inclusion of innovation as a strategic line, in which the capacities of the countries to leverage the new frontier of science, technology and innovation will be one of the central elements to promote new industries of bioproducts and bioservices; and 2) the strategic areas of work, specifically in the field of bioeconomy.

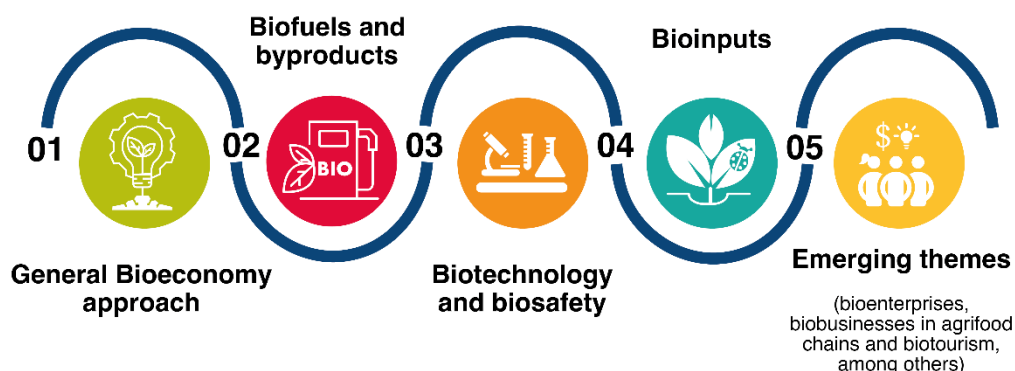
Although it is still necessary to persuade and raise awareness of the potential of the bioeconomy in favor of development, today the greatest challenge for LAC in this regard is to utilize and consolidate the efforts already undertaken, by leveraging its comparative advantages with respect to other regions. Significant progress has been made in the early stages and it is time to materialize them in the form of policies, projects and high-impact investments, for which the objectives and strategic work areas have been redefined in the 2022-2026 MTP.

The Innovation and Bioeconomy Program will have the following new objectives (IICA 2022):

- Position the potential of the bioeconomy in discussions and the main regional and international technical-political forums through the generation and dissemination of information, analysis and evidence.
- Strengthen general and specific capacities in key areas for the development of the bioeconomy.
- At the national and international levels, support the design of policies, standards and regulations that reflect the characteristics and needs of the different sectors of the bioeconomy.
- Develop tools, provide direct technical support and promote south-south cooperation and the establishment of regional networks of knowledge, good practices and lessons learned on the formulation, implementation and evaluation of public policies, institutions and instruments to strengthen ties with the markets.
- Support the management of support services and investment projects for the promotion of bioenterprises.
- Strengthen capacities in research, development and innovation (R&D&I) so that countries can benefit from the new frontier of science, technology and innovation (STI) in the bioeconomy, in order to increase efficiency, sustainability and inclusion in agri-food systems.

To meet these objectives, the Innovation and Bioeconomy Program has been structured around 5 thematic pillars (see illustration 4) and 6 action lines:

Illustration 4. Thematic pillars of the Innovation and Bioeconomy Program.



Action lines:

In each of the thematic pillars, the Innovation and Bioeconomy Program will work together with partners and allies in the following 6 action lines:

Knowledge management regarding the opportunities that the bioeconomy can offer to agri-food systems and rural territories.

To truly take advantage of the productive, industrial and commercial opportunities offered by the bioeconomy, it is essential to demonstrate its potential and persuade public policymakers, donors, researchers, academics, producers, industrialists, traders and consumers.

To this end, the Program will continue to produce evidence (research, technical and thesis studies) on the demonstrated results of bioeconomy practices in terms of profitability, increased income, generation of new social opportunities (new jobs, opportunities for youth and women, etc.), decarbonization, environmental resilience, etc. In order to convince people, it is essential to add numbers to the evidence. Furthermore, materials will be generated and shared (working documents, brochures, infographics, videos, etc.) to communicate the message in a simple and easy way to authorities and technical staff of public institutions related to the topic, civil society, private companies, and partner organizations. Spaces will also be created for analysis and discussion about the potential of the bioeconomy and the requirements for its use (seminars, forums, workshops, etc.).

Strengthening technical, managerial and organizational capacities for the promotion and use of the bioeconomy.

The promotion of a new production model focused on the efficient and sustainable use and industrialization of biological resources requires a new generation of capabilities at all levels.

Value chain actors will need to acquire the capabilities to manage these new processes, which are generally much more knowledge-intensive than conventional approaches. In most bioeconomy practices, the success of technological innovation will depend on the skills in biological sciences and the level of training of human resources in the different stages of production, transformation or commercialization to understand and manage the intrinsic dynamics of the biological processes.

With this conviction, together with academic institutions in the region, we will continue to promote the creation and strengthening of capacity development programs at all levels, mainly through self-managed virtual courses aimed at all audiences, diploma programs to strengthen specific capacities of technical staff, academic or managerial courses, formal university courses (undergraduate, graduate or post-graduate programs) and specialization courses where, in addition to delving into bioeconomy issues, theoretical and methodological knowledge is applied in the field.

Furthermore, to maximize the productive use of biological resources and principles, new organizational modalities are required that allow more efficient and equitable access to these resources and their utilization, as well as to the benefits obtained from them. In order to improve participation in these new dynamics, formal education will be provided to strengthen the capacities of stakeholders in rural and business agricultural extension, social communication, decision making and governance of the territories and chains, among others.

Support for the formulation and implementation of strategies, policies, standards and regulations for the promotion of the bioeconomy.

Similarly to other economic turning points, the transition towards a new productive model based on the bioeconomy requires that scientific-technological advances be accompanied by regulatory and political frameworks, as well as market approaches and inclusive mechanisms that generate incentives for economic agents to make the decision to use knowledge about biological resources, processes and principles more efficiently and sustainably in their production, transformation and marketing models.

In this sense, the Program will support the countries of the region in the formulation and implementation of:

- a) national or regional strategies and policies dedicated to the bioeconomy that become strategic roadmaps and promote alignment and synergies between investment policy instruments and decisions of public-private actors;
- b) regulatory and normative frameworks in the pathways of the bioeconomy (biofuels, biotechnology, bioinputs, bioentrepreneurship, etc.) that not only promote their production, commercialization and consumption, but also ensure advances within a framework of sustainability and security;
- c) instruments aimed at promoting the creation or growth of markets for bioeconomy products, such as incentives in public procurement systems, labeling and standards programs, as well as market regulation and transparency mechanisms, etc.; and
- d) economic, financial and fiscal support services to strengthen the value chains of the bioeconomy, such as financing systems, tax credits, investment funds, support programs, etc.

Promotion of investments, businesses and ventures in the bioeconomy.

Bioeconomic businesses and ventures are one of the most tangible and relevant expressions through which the different practices of the bioeconomy are transformed into new bioproducts and bioservices established in the markets. This type of biobusiness increases cascade value addition and converts waste into inputs for the production of bioproducts and bioservices, which in turn drives the creation of new biological industries in agricultural and rural territories. In addition, they target national and international markets with annual growth rates that multiply up to seven times the growth of traditional agriculture (organic product markets for the industries that produce food, chemicals, energy, cosmetics, construction, textile products, etc.) (Betancur et al. 2018, FAO 2018).

With the aim of promoting new businesses and ventures in the bioeconomy, three action pillars have been defined:

- **Awareness raising.** We will work together with other partners and allies to increase knowledge and conviction about the opportunities and market requirements for bioproducts and bioservices, for which we will support research on the commercial potential of new bioproducts. This will include the organization of forums for dialogue and discussion with the stakeholders (public and private sector, researchers, academia, etc.) and case studies to demonstrate the economic, social and environmental results of the different initiatives.

- **Training.** The technical, organizational and business capabilities of bioeconomy entrepreneurs will be strengthened, especially in preliminary and incubation stages (support in the generation of ideas, modeling and formulation of business plans). For this, we will work together with academic, business and scientific institutions and international cooperation organizations.
- **Outreach.** One of the main tasks of the Program will be to promote the creation or strengthening of links and synergies between researchers, entrepreneurs and other stakeholders in the entrepreneurial ecosystem (incubators, accelerators, expansion centers, investment funds, actors in national and international markets, etc.).

BOX 1

To meet the proposed objectives, together with various partners and allies, the Innovation and Bioeconomy Program has built a tool called Hub for Innovation and Entrepreneurship based on the bioeconomy. This is a web platform that offers various support services to researchers and entrepreneurs, depending on the stage of maturity of the biobusiness. Its main sections are: 1) virtual courses (most of which are free to access) specialized in entrepreneurship, developed by IICA, universities and international cooperation institutions; 2) support services for the strengthening of bioentrepreneurship, offered by the Institute and the international entrepreneurship ecosystem (incubation, acceleration and expansion programs, availability of resources for financing, etc.); and 3) systematization of business cases (most of them successful) that serve as motivation and as a reference for the process to be followed by potential or developing bioentrepreneurs.

In addition to making available the products and services generated by IICA for the promotion of bioeconomy innovations and ventures, the hub is a means to strengthen relationships between actors in the regional ecosystem. For more information, visit: <https://bio-emprender.iica.int>.

Positioning of LAC in the main global bioeconomy forums and promotion of regional networks for south-south cooperation.

Considering the biological and productive potential of LAC to benefit from the bioeconomy, the region must have greater and better participation (even a central role) in the discussions and decisions made in the main technical, political and financial spaces of the bioeconomy in the world. In these forums, good practices and lessons learned in terms of policies, business and innovations for the bioeconomy are shared and agreements are reached on the main cooperation projects and investments to be executed for their promotion.

Likewise, considering that a large part of the needs, challenges and opportunities in the field of bioeconomy are shared, LAC must advance in the creation and maturation of regional spaces for south-south cooperation, which allow not only knowledge management and learning, but also joint construction. To position the bioeconomy as a model of productive-commercial development in LAC, these regional spaces must create synergies between all public-private actors, academia and international organizations related to the management of public policies, research and development (R&D). and investment projects.

Due to the above, the Program will continue working on: 1) promoting more spaces to better position the region and countries in the global discussion on bioeconomy and its paths; 2) strengthening the capacities of the countries' decision-makers, technicians and negotiators so that they have greater and better participation and even become protagonists in the discussions and negotiations; 3) fostering the creation and development of networks, coalitions and alliances between the actors that influence the policies, R&D, investments and businesses of the bioeconomy in LAC.

Strengthening national capacities to take advantage of knowledge and new STI of the bioeconomy.

A greater use of biological resources, processes and principles in the development of new bioproducts and bioservices will only be possible using new knowledge, science, technologies and information. While it is true that, in the long term, the greatest potential will be found in advances in the biological sciences, chemistry, physics, AI and ICT (through which there will be improved varieties and new ways of using biomass), in the short and medium terms it will be possible to take greater advantage of conventional technology and ancestral knowledge. This implies working in a possible scenario of technological "hybridization", where traditional technologies and new sciences and technologies are intertwined to develop more efficient, profitable and environmentally friendly production-industrialization models. In order to achieve these multiple objectives, it is essential to generate greater and more precise knowledge to manage the transformation processes of resources such as water, nutrients and solar energy into biomass susceptible to exploitation by man through biological entities. Moving towards this objective will require increasing and

reorienting investments in R&D, as well as promoting the adoption and use of scientific results among the actors in the productive and industrial chains.

To this end, through the Innovation and Bioeconomy Program, support will be provided to countries in: 1) raising awareness and conviction regarding the contribution of the bioeconomy to the transformation of agri-food systems; 2) strengthening the technical, human and financial capacities of national R&D institutions in STI of the bioeconomy; 3) the development of strategic R&D agendas for the bioeconomy; 4) the establishment or consolidation of networks and consortia for R&D&I of the bioeconomy; and 5) strengthening the ecosystem for incubation, expansion and acceleration of bioeconomy innovations for agri-food systems.

Box 2

Innovation as the cornerstone for strengthening and transforming agri-food systems.

Strengthening and transforming LAC agri-food systems so that they are more competitive, sustainable and inclusive involves the joint establishment of new economic-social processes and relationships in all links of production, transformation, industrialization, marketing and consumption. According to new definitions, this is what innovation consists of.

According to IICA (2019):

Innovation in agriculture is the implementation, for the first time in a specific context, of a new or improved product or process, in order to create positive changes that make it possible to satisfy needs, meet challenges or take advantage of opportunities. Innovations may be of a technological, social, organizational and/or institutional nature. There are also innovations in products

and processes, such as the following: i) goods that are produced (for example, polymers for industry) or services that are provided (for example, ecosystem services); ii) Processes: ways and means of producing, providing services, marketing, organizing, associating with others, etc. Digitalization is an example.

Science and technology constitute a central element of innovation; however, this also includes changes in processes and relationships of a social, organizational, commercial, institutional nature.

Given that the multidimensional and comprehensive nature of innovation greatly exceeds the tasks of the Innovation and Bioeconomy Program, within the Institute the issue of innovation will be managed directly from the Directorate of Technical Cooperation (DCT), to promote joint work and synergies between programs and cooperation mechanisms.

In addition to carrying out work together with the other DCT programs, the Innovation and Bioeconomy Program will be specifically responsible for promoting the generation, incubation, acceleration and expansion of technical-scientific advances and bioeconomy innovations in value chains. and rural territories. Another document will include details of the conceptual and methodological approaches to innovation in agri-food systems and present IICA's technical cooperation proposal on this topic.

Work dynamics and links of the Program

Fully leveraging the bioeconomy as a productive model and strategy to strengthen and transform LAC's agri-food systems is a task that exceeds our capabilities, hence we must work as a team and generate synergies. In this regard, the Innovation and Bioeconomy Program strongly encourages joint work and strong ties among stakeholders.

With the other **DCT programs**, we work on developing conceptual and methodological approaches that serve as public goods to analyze and promote the relationships between the topics of bioeconomy and rural territories, environmental sustainability, climate change, international trade, digital agriculture, gender equity and youth.

Together with the other **Directorates at Headquarters and the Delegations of the Institute** in the countries, as well as with various partners and allies, the Innovation and Bioeconomy Program works on the formulation and implementation of projects through which concrete actions are undertaken on the ground for knowledge management, capacity building, promotion of public policies and regulations and promotion of investment projects for the region's bioeconomy value chains.

Furthermore, the Program contributes to the important efforts made in two cross-cutting initiatives of IICA's technical cooperation: a) the Observatory of Public Policies for Agri-Food Systems, which serves as a repository and space for systematization and discussion of the public bioeconomy policies in LAC, in order to identify and leverage the knowledge generated, good practices and lessons learned; and b) the Leadership School for the Transformation of Agri-Food Systems of the Americas, which brings together the efforts of the Institute and other partner entities for capacity building and promotion of leadership in the bioeconomy for the transformation of the agri-food systems of the region.

BOX 3

Networks and coalitions for the advancement of the bioeconomy within the framework of a continental alliance.

Aware of the need and urgency to unite the efforts of governments, civil society and international organizations, IICA is committed to promoting the Continental Alliance for Food Security and Sustainable Development in the Americas. At the express request of the ministerial delegates who attended the Executive Committee meeting in 2023, the Institute will promote consensus, shared work agendas, networks and alliances between the main regional and national leaders on the most significant issues for transformation (including actions and financing to face climate change and develop science, technology, innovation and digital agriculture, bioeconomy, productive, economic and social inclusion of family farming, equity and equality, the "One Health" approach and international trade, among others).

Within the framework of the Continental Alliance for Food Security and Sustainable Development of the Americas, together with various partners and allies, 3 specific initiatives have been promoted in the Innovation and Bioeconomy Program:

The Latin American Bioeconomy Network. This network emerges as a space for dialogue, discussion and joint construction for the main national, regional and international leaders that promote capacity building efforts, public policies and investment projects for the bioeconomy in LAC. Its work priorities are: 1) the determination of metrics for the bioeconomy, 2) the governance of regional, national and local bioeconomies, 3) the positioning of the bioeconomy in regional and international decision-making spaces, 4) awareness and communication regarding the potential and risks of the bioeconomy, 5) the acceleration and expansion of bioeconomy solutions (bioenterprises) and 6) the creation of bioeconomy approaches. IICA acts as the technical and executive secretariat of the Network.

Pan-American Liquid Biofuels Coalition (CPBIO). Made up of the main business and industrial associations of the Americas dedicated to the production and processing of sugar, alcohol, corn, sorghum, soybeans, vegetable oil and grains, among other products of the agricultural sector. The CPBIO, created in 2023 during the Pan American Liquid Biofuels Summit organized in Costa Rica by the Institute, aims to coordinate the sustainable production, promotion and consumption of liquid biofuels throughout the hemisphere. IICA acts as the Technical Secretariat of this coalition.

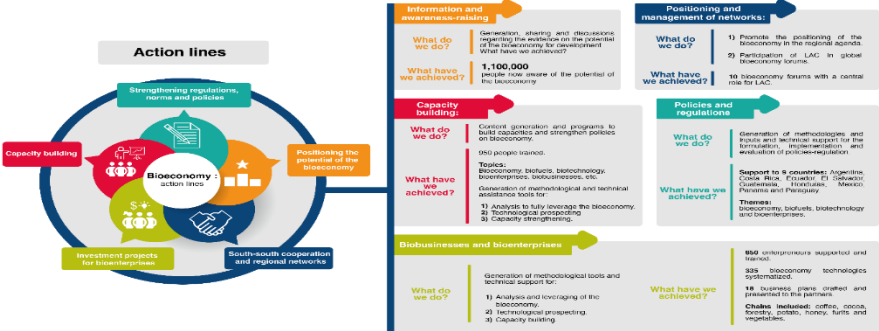
Pan-American Bioinputs Forum. This collaborative space between LAC countries and institutions, oriented towards strengthening the subsector, arose from the need to address important gaps and challenges around normative and regulatory issues, production processes, and research and financing through an integrated approach. This platform, whose creation was proposed during the Pan American Bioinputs Forum organized in 2023 in Panama by the Institute, FONTAGRO, the Inter-American Development Bank and the European Union, promotes joint work aimed at strengthening, developing and promoting better use of these products of biological origin.

IICA's experience in promoting the bioeconomy in LAC

As mentioned above, over the last 6 years the Bioeconomy and Productive Development Program (name of the Innovation and Bioeconomy Program in the previous MTP) worked together with important partners and allies to promote the bioeconomy vision, policies and investments in LAC. These efforts of the Institute, combined with various initiatives promoted by countries and other cooperation organizations, have allowed the region's bioeconomy to reach a greater degree of maturity. As an example, illustration 5 presents some results of the technical cooperation actions carried out by the Innovation

and Bioeconomy Program during 2022 and the first half of 2023, which reflect the impact achieved.

Illustration 5. Results of the actions to promote the bioeconomy in LAC carried out by IICA during 2020 and the first half of 2023.



Among the actions carried out, it is worth highlighting the preparation of technical documents, case studies and other informative materials, as well as the organization of virtual and in-person events and participation in them, with the objective of sharing and discussing the vision of the Institute to fully leverage the potential of the bioeconomy in LAC. This has been the case since the beginning of the Program, and being a new topic for the majority, there remains an interest on the part of decision makers, businesses, producers, academics and students in knowing more about the potential of this new model of productive development.

Likewise, great efforts have been devoted to capacity building. Together with various partners and allies, programs have been designed in hybrid learning formats that allow us to reach the target groups of the bioeconomy (many of which are located in rural territories). During the last year, a specialized postgraduate program was organized in collaboration with the Ministry of Education of the Argentine Republic, together with a diploma in bioeconomy for the coffee chain, carried out with the Technological University of Pereira in Colombia. There has also been a strong push to develop capabilities in biotechnology, biosafety, biofuels, biobusinesses and bioentrepreneurship.

Supporting countries in the formulation and implementation of strategies, public policies and regulatory frameworks for the promotion of the bioeconomy and its pathways has also been a priority of the Program. Guides, methodologies and training courses have been designed, while on-the-ground assistance has been provided to carry out management processes in Argentina, El Salvador, Guatemala, Honduras, Mexico and Paraguay, among other countries. Finally, the Program has worked hard to achieve better participation and positioning of LAC in the main global bioeconomy forums. In recent years,

important results have been achieved, such as the central role given to the region in the World Bioeconomy Council, the organization of a side event during the 2022 Conference of the Parties, the co-organization of the 27th Conference of the International Consortium for Applied Bioeconomy Research in Buenos Aires, Argentina, and the organization of the Aviation Biofuels Summit, among other events with significant Latin American participation.

More details on the main technical cooperation products generated by the Innovation and Bioeconomy Program can be found at: <https://bit.ly/3Phc2Wq>.

Bibliography

- Aramendis, RH; Rodríguez, AG; Krieger Merico, LF. 2018. Contribuciones a un gran impulso ambiental en América Latina y el Caribe: bioeconomía (online). Santiago, Chile, ECLAC. Consulted 16 June 2023. Available at <https://www.ECLAC.org/es/publicaciones/43825-contribuciones-un-gran-impulso-ambiental-america-latina-caribe-bioeconomia>.
- Betancur, CM; Moñux, D; Canavire, G; Villanueva, DF; García, J; Renza, LM; Méndez, K; Zúñiga, AC; Pérez, EO. 2018. Estudio sobre la bioeconomía como fuente de nuevas industrias basadas en el capital natural de Colombia n.º 1240667, fase I (online). Colombia, BIOinTROPIC. 120 p. Consulted 16 June 2023. Available at <https://www.unilivre.edu.co/pereira/images/biotecnologia/pdf/10-informebiotropico.pdf>.
- Bisang, R; Regúnaga, M. 2022. La bioeconomía como estrategia para fortalecer la integración del Mercosur (online). San José, Costa Rica, IICA. 110 p. Consulted 16 June 2023. Available at <https://repositorio.iica.int/bitstream/handle/11324/21344/BCO22118631e.pdf?sequence=1&isAllowed=y>.
- Bisang, R; Trigo, E. 2017. Bioeconomía argentina: modelos de negocios para una nueva matriz productiva (online). Buenos Aires, Argentina, Ministry of Agroindustry. Consulted 16 June 2023. Available at https://www.magyp.gob.ar/sitio/areas/bioeconomia/_archivos/Modelo_de_negocios.pdf.
- Bröring, S; Laibach, N; Wustmans, M. 2020. Innovation types in the bioeconomy (online). Journal of Cleaner Production 43(266):1-14. Consulted 16 June 2023. Available at <https://doi.org/10.1016/j.jclepro.2020.121939>.
- Castro, E; Romero, I. 2022. Biorefinery based on waste biomass (online). Energies 15(1):54. Consulted 16 June 2023. Available at <https://doi.org/10.3390/en15010054>.
- Çeliktas, MS; Uyan, M; Alptekin, M. 2019. Biorefinery concept: current status and future prospects (online). International Conference on Engineering Technologies (12, 2017, Konya, Turquía). Konya, Turkey. 7 p. Consulted 16 June 2023. Available at https://www.researchgate.net/publication/331166360_Biorefinery_concept_Current_status_and_future_prospects.
- Chavarría, H; Quiroga, G; Rocha, P; Blanco, M; Torroba, A; Vega, O. 2019. Programa de Bioeconomía y Desarrollo Productivo. San José, Costa Rica.
- Chavarría, H; Trigo, E; Villarreal, F; Elverdín, P; Piñeiro, V. 2020. Policy brief bioeconomy: a sustainable development strategy (online). Saudi Arabia. Consulted 16 June 2023. Available at https://t20saudiarabia.org.sa/en/briefs/Documents/T20_TF10_PBI3.pdf.
- CIAO (Inter-American Commission on Organic Agriculture, Argentina). 2023. Convenio entre la Comisión Interamericana de Agricultura Orgánica (CIAO) y el Instituto Interamericano de Cooperación para la Agricultura (IICA) para Brindar Cooperación Técnica y Administrativa al Fortalecimiento de la Agricultura Orgánica en las Américas (online). San José, Costa Rica. Consulted 16 June 2023. Available at https://www.ciaorganico.net/institucional_estructura.php.
- Congressional Research Service. 2022. The U.S. bioeconomy: an overview of federal activities (online). Washington D. C., United States of America. Consulted 12 June 2023. Available at <https://crsreports.congress.gov/product/pdf/R/R46881>.
- Culaba, AB; Mayol, AP; San Juan, JLG; Ubando, AT; Bandala, AA; Concepción II, RS; Alipio, M; Chen, WH; Show, PL; Chang, JS. 2023. Design of biorefineries towards carbon neutrality: a critical review (online). Consulted 16 June

2023. Available at Bioresource Technology 369:1-32.
<https://www.sciencedirect.com/science/article/abs/pii/S0960852422015899>.

D'Amato, D; Droste, N; Allen, B; Kettunen, M; L\"ah\"tinen, K; Korhonen, J; Leskinen, P; Matthies, BD; Toppinen, A. 2017. Green, circular, bio economy: a comparative analysis of sustainability avenues (online). *Journal of Cleaner Production* 168:716-734. Consulted 16 June 2023. Available at <https://www.sciencedirect.com/science/article/pii/S0959652617320425?via%3Dihub>.

Demirbas, A. 2001. Biomass resource facilities and biomass conversion processing for fuels and chemicals. *Energy Conversion and Management* 42(11):1357-1378.

Dietz, T; B\"orner, J; F\"orster, JJ; von Braun, J. 2018. Governance of the bioeconomy: a global comparative study of national bioeconomy strategies (online). Bonn, Germany, ZEF. Consulted 16 June 2023. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3214439.

Echeverr\'ia, R. 2023. Perspectivas sobre el financiamiento a la innovaci3n, ciencia y tecnolog\'ia agroalimentaria en Am3rica Latina y el Caribe (ppt). *In* Di3logo Regional sobre Ciencia, Tecnolog\'ia e Innovaci3n en los Sistemas Agroalimentarios de Am3rica Latina y el Caribe (1, 2023, San Jos3, Costa Rica, IICA). San Jos3, Costa Rica, IICA.

ECLAC (Economic Commission for Latin America and the Caribbean, Chile). 2020. Am3rica Latina y el Caribe tendr3 crecimiento positivo en 2021, pero no alcanzar3 para recuperar los niveles de actividad econ3mica pre-pandemia. (online, web page). Consulted 16 June 2023. Available at <https://www.ECLAC.org/es/comunicados/america-latina-caribe-tendra-crecimiento-positivo-2021-pero-alcanzara-recuperar-niveles>.

ECLAC (Economic Commission for Latin America and the Caribbean, Chile). 2022. Las tasas de pobreza en Am3rica Latina se mantienen en 2022 por encima de los niveles prepandemia, alerta la CEPAL (online, p3gina web). Consulted 16 June 2023. Available at <https://www.ECLAC.org/es/comunicados/tasas-pobreza-america-latina-se-mantienen-2022-encima-niveles-prepandemia-alerta-la>.

ECLAC (Economic Commission for Latin America and the Caribbean, Chile); FAO (Food and Agriculture Organization of the United Nations, Chile); IICA (Inter-American Institute for Cooperation on Agriculture, Costa Rica). 2019. La bioeconom\'ia: potenciando el desarrollo sostenible de la agricultura y los territorios rurales en ALC (online). San Jos3, Costa Rica, IICA. Consulted 16 June 2023. Available at <https://repositorio.iica.int/bitstream/handle/I1324/I2380/BVE20107947e.pdf?sequence=1&isAllowed=y>.

EEA (European Environment Agency, Denmark). 2018. The circular economy and the bioeconomy: partners in sustainability (online). Luxemburg, EU. Consulted 16 jun. 2023. Available at https://circulareconomy.europa.eu/platform/sites/default/files/the_circular_economy_and_the_bioeconomy_-_partners_in_sustainabilitythal18009enn.pdf.

European Commission. 2005. New perspectives on the knowledge-based bio-economy: conference report: transforming life sciences knowledge into new, sustainable, eco-efficient and competitive products (online). Brussels, Belgium. Consulted 16 June 2023. Available at http://edz.bib.uni-mannheim.de/daten/edz-bra/gdre/05/kbbe_conferencereport.pdf.

FAO (Food and Agriculture Organization of the United Nations, Chile). 2016. P3rdidas y desperdicios de alimentos en Am3rica Latina y el Caribe (online). Santiago, Chile. Consulted 16 June 2023. Available at <http://www.fao.org/3/a-i5504s.pdf>.

FAO (Food and Agriculture Organization of the United Nations, Italy). 2011. Bioenerg\'ia y seguridad alimentaria. Rome, Italy.

- FAO (Food and Agriculture Organization of the United Nations, Italy). 2018. FAOSTAT: datos sobre alimentación y agricultura (online). Rome, Italy. Consulted 16 June 2023. Available at <https://www.fao.org/faostat/es/#home>.
- Ferreira, V; Pié, L; Terceño, A. 2018. A systematic literature review of bio, green and circular economy trends in publications in the field of economics and business management (online). Sustainability 10(11). Consulted 16 June 2023. Available at <https://doi.org/10.3390/su10114232>.
- FONTAGRO (Regional Fund for Agricultural Technology, United States of America). 2016. Convenio del Programa Cooperativo para el Fondo Regional de Tecnología Agropecuaria (online). Washington D. C. Consulted 16 June 2023. Available at <https://www.fontagro.org/es/documentos-institucionales/convenio/>.
- FORAGRO (Forum of the Americas for Agricultural Technological Research and Development, Costa Rica). 2017. FORAGRO bylaws (online, website). Consulted 16 June 2023. Available at <https://www.foragro.org/documentos/estatuto-de-foragro>.
- Friends of the Earth Europe; Friends of the Earth Austria; SERI (Sustainable Europe Research Institute, Austria). N.d. ¿Consumimos demasiado? Cómo utilizamos los recursos naturales del planeta (online, website). Consulted 16 June 2023. Available at https://www.foeeurope.org/sites/default/files/publications/foee_esp_overconsumption_0909.pdf.
- Government of Canada. 2019. Bioeconomy strategy: Leveraging our Strengths for a Sustainable Future (online). 68 p. Consulted 16 June 2023. Available at https://www.biotech.ca/wp-content/uploads/2022/01/National_Bioeconomy_Strategy_EN-compressed.pdf.
- Government of Canada. 2023. Canadian agricultural partnership (online, website). Consulted 16 June 2023. Available at <https://agriculture.canada.ca/en/department/initiatives/canadian-agricultural-partnership>.
- Government of Colombia. 2020. Bioeconomía para una Colombia potencia viva y diversa: hacia una sociedad impulsada por el conocimiento (online). Bogotá. 47 p. Consulted 16 June 2023. Available at https://minciencias.gov.co/sites/default/files/upload/paginas/bioeconomia_para_un_crecimiento_sostenible-qm_print.pdf.
- Gowdy, J; Mesner, S. 1998. The evolution of Georgescu-Roegen's bioeconomics (online). Review of Social Economy 56(2):136-156. Consulted 16 June 2023. Available at <http://www.jstor.org/stable/29769942>.
- Hanson, C; Lipinski, B; Fredrich, J; O'Connor, C. 2015. What's food loss and waste got to do with climate change?: a lot, actually (online). Washington D. C., United States of America, WRI. Consulted 16 June 2023. Available at <https://www.wri.org/insights/whats-food-loss-and-waste-got-do-climate-change-lot-actually>.
- Henry, G; Hodson, E; Aramendis, R; Trigo, E; Rankin, S. 2017. La bioeconomía: motor de desarrollo integral para Colombia (online). Cali, Colombia, CIRAD. Consulted 16 June 2023. Available at https://cgspace.cgiar.org/bitstream/handle/10568/90548/La_bioeconom%C3%ADa_motor_de_desarrollo_integral_para_Colombia.pdf?sequence=1.
- IEA (International Energy Agency, France). 2021. Key world energy statistics 2021 (online). Paris. Consulted 16 jun. 2023. Available at <https://www.iea.org/reports/key-world-energy-statistics-2021>.
- IICA (Inter-American Institute for Cooperation on Agriculture, Costa Rica). 2018. Medium-Term Plan 2018-2022 (online). San José, Costa Rica. Consulted 16 June 2023. Available at <https://repositorio.iica.int/bitstream/handle/11324/7191/BVE18040249e.pdf?sequence=1&isAllowed=y>.

- IICA (Inter-American Institute for Cooperation on Agriculture, Costa Rica). 2019. Innovación y tecnología (online). San José, Costa Rica. Consulted 16 June 2023. Available at <http://repositorio.iica.int/bitstream/handle/11324/7974/BVE19040251e.pdf?sequence=1&isAllowed=y>.
- IICA (Inter-American Institute for Cooperation on Agriculture, Costa Rica). 2020a. Bioeconomía: potencial y retos para su aprovechamiento en América Latina y el Caribe: manual de capacitación (online). San José, Costa Rica. 116 p. Consulted 16 June 2023. Available at <https://repositorio.iica.int/handle/11324/18701>.
- IICA (Inter-American Institute for Cooperation on Agriculture, Costa Rica). 2020b. Las rutas de la bioeconomía en el Ecuador (online, web page). Consulted 16 June 2023. Available at <http://www.iica-ecuador.org/sisbio/index.php>.
- IICA (Inter-American Institute for Cooperation on Agriculture, Costa Rica). 2022. Medium-Term Plan (MTP) for the period 2022-2026 (online). Consulted 16 June 2023. Available at <https://repositorio.iica.int/bitstream/handle/11324/20969/BVE22098277e.pdf?sequence=5&isAllowed=y>.
- IICA (Inter-American Institute for Cooperation on Agriculture, Costa Rica); IDB (Inter-American Development Bank, United States of America); AgMIP (Agricultural Model Intercomparison and Improvement Project, United States of America); BIOFIN (Biodiversity Finance Initiative, Costa Rica); CGIAR (Consultative Group for International Agricultural Research, France); ACTO (Amazon Cooperation Treaty Organization, Brazil); Coalición de Economía Circular; Suricata, ALBIOTEC (Latin American Biotechnology Association, Peru); iGEM (International Genetically Engineered Machine, United States of America). 2023. Informe sobre el estado y perspectivas de la bioeconomía en América Latina y el Caribe. San José, Costa Rica. To be published soon.
- IMF (International Monetary Fund, United States of America). 2021. La economía mundial se está afianzando, pero con recuperaciones divergentes en medio de aguda incertidumbre (online, web page). Washington D. C. Consulted 16 June 2023. Available at <https://www.imf.org/es/Publications/WEO/issues/2021/03/23/world-economic-outlook-april-2021>.
- INNOVAGRO (Red de Gestión de la Innovación en el Sector Agroalimentario, Mexico). 2023. Convenio de la red de gestión de la innovación del sector agroalimentario (online, web page). Consulted 14 June 2023. Available at <https://www.redinnovagro.in/>.
- IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Germany). 2018. Report of the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services during the Sixth period of sessions (online). Medellín, Colombia. Consulted 16 June 2023. Available at https://www.ipbes.net/system/tdf/ipbes_6_15_add.2_spm_americas_spanish.pdf?file=1&type=node&id=28521.
- IPCC (Intergovernmental Panel on Climate Change, Switzerland). 2011. Informe especial sobre fuentes de energía renovables y mitigación del cambio climático: resumen para responsables de políticas y resumen técnico (online). Cambridge, United Kingdom, CUP. 228 p. Consulted 16 June 2023. Available at https://archive.ipcc.ch/pdf/special-reports/srren/srren_report_es.pdf.
- IPCC (Intergovernmental Panel on Climate Change, Switzerland). 2013. Climate change 2013: the physical science basis: contribution of Working Group I to the Fifth assessment report of the Intergovernmental Panel on Climate Change (online, web page). Cambridge, United Kingdom, CUP. Consulted 16 June 2023. Available at <https://www.ipcc.ch/report/ar5/wgl/>.
- IPCC (Intergovernmental Panel on Climate Change, Switzerland). 2022. Summary for policymakers. In Pörtner, HO; Roberts, DC; Tignor, M; Poloczanska, ES; Mintenbeck, K; Alegría, A; Craig, M; Langsdorf, S; Löschke, S; Möller, V; Okem, A; Rama, B (eds.). Climate Change 2022: impacts, adaptation and vulnerability: contribution of Working

- Group II to the Sixth assessment report of the Intergovernmental Panel on Climate Change (online). New York, United States of America, CUP. p. 3–33. Consulted 16 June 2023. Available at https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf.
- López Neila, JC; Acedos, MG; Ruiz Fuertes, B. 2020. Biorrefinerías: el futuro para la transición hacia la (bio)economía circular (online). *Industria Química*: 50–57. Consulted 16 June 2023. Available at https://www.urbiofin.eu/wp-content/uploads/2020/08/202004_Biorrefiner%C3%ADas-el-futuro-para-la-transici%C3%B3n-hacia-la-bioeconom%C3%ADa-circular_ainia.pdf.
- MAATE (Ministry of Environment, Water and Ecological Transition, Ecuador). 2020. Ecuador promueve la bioeconomía como una estrategia para el desarrollo sostenible (online, web page). Consulted 16 June 2023. Available at <https://www.ambiente.gob.ec/ecuador-promueve-la-bioeconomia-como-una-estrategia-para-el-desarrollo-sostenible/>.
- MAPA (Ministry of Agriculture, Livestock and Food Supply, Brazil). 2019. Portaria n.º 121, de 18 de junho de 2019 (online, web page). *Diário Oficial da União* 117(1):4. 16 June. Consulted 16 June 2023. Available at <https://www.in.gov.br/en/web/dou/-/portaria-n-121-de-18-de-junho-de-2019-164325642>.
- Martínez-Gutiérrez, E. 2018. Biogas production from different lignocellulosic biomass sources: advances and perspectives (online). *Biotech* 8(5):233–269. Consulted 16 June 2023. Available at <https://pubmed.ncbi.nlm.nih.gov/29725572/>.
- Martins, NO. 2016. Ecosystems, strong sustainability and the classical circular economy (online). *Ecological Economics* 129:32–39. Consulted 16 June 2023. Available at <https://doi.org/10.1016/j.ecolecon.2016.06.003>.
- MEC (Ministry of Economy, Argentina). 2021. Bioeconomía (online, web page). Consulted 14 June 2023. Available at <https://www.argentina.gob.ar/agricultura/bioeconomia#:~:text=La%20Bioeconom%C3%ADa%20consiste%20en%20la,o%20transformaci%C3%B3n%20de%20recursos%20biol%C3%B3gicos>.
- MEC (Ministry of Economy, Argentina). 2023. Provision 11/2023: DI-2023-11-APN-SSABDR#MEC (online). Official Bulletin of Argentina 1. 8 May. Consulted 16 June 2023. Available at <https://www.boletinoficial.gob.ar/detalleAviso/primera/286132/20230510>.
- MICITT (Ministry of Science, Technology and Telecommunications, Costa Rica). 2020. Estrategia nacional de bioeconomía: Costa Rica 2020–2030: hacia una economía con descarbonización fósil, competitividad, sostenibilidad e inclusión (online). San José, Costa Rica. 82 p. Consulted 16 June 2023. Available at https://www.conagebio.go.cr/sites/default/files/2022-11/Estrategia%20Nacional%20Bioeconom%C3%ADa%20CR_0.pdf.
- OECD (Organization for Economic Cooperation and Development, France); FAO (Food and Agriculture Organization of the United Nations, Italy). 2017. OCDE-FAO: perspectivas agrícolas 2017–2026 (online). Paris. 154 p. Consulted 16 June 2023. Available at <https://www.fao.org/3/i7465s/i7465s.pdf>.
- Office of the Bioeconomy Council. 2018. Global Bioeconomy Summit Conference Report: innovation in the global bioeconomy for sustainable and inclusive transformation and wellbeing (online). Berlin, Germany. 104 p. Consulted 16 June 2023. Available at https://gbs2020.net/wp-content/uploads/2021/10/GBS_2018_Report_web.pdf.
- PROCINORTE (Cooperative Program in Research and Technology for the Northern Region, United States of America). 2023. About us (online). Consulted 12 June 2023. Available at <https://www.procinorte.net/about/>.

- PROCISUR (Cooperative Program in Agrifood and Agroindustrial Technological Development for the Southern Cone, Uruguay). 2023. Institutional (online, web page). Consulted 16 June 2023. Available at <https://www.procisur.org.uy/institucion/es>.
- Productiva Comunicación & Marketing. 2022. Trazan hoja de ruta para construir estrategia de bioeconomía nacional (online, web page). Consulted 14 June 2023. Available at <https://www.productivacm.com/trazan-hoja-de-ruta-para-construir-estrategia-de-bioeconomia/>.
- PROMECAFÉ (Regional Cooperative Program for the Technological Development and Modernization of Coffee Production, Guatemala). 2023. News (online, web page). Consulted 14 June 2023. Available at <https://promecafe.net/#>.
- Rodríguez, L. 2023. Brasil destina R\$ 5 millones para bioeconomía en la Amazonía: los recursos apoyarán a poblaciones que viven del extractivismo (online). Agência Brasil, Río de Janeiro, Brazil; 23 abr. Consulted 16 June 2023. Available at <https://agenciabrasil.ebc.com.br/es/economia/noticia/2023-04/bndes-destinara-r-25-millones-bioeconomia-en-la-amazonia>.
- Schor, T. 2023. Biodiversidad, desarrollo e inclusión en la Amazonía (online, página web). Washington D. C., United States of America, IDB. Consulted 16 June 2023. Available at <https://blogs.iadb.org/sostenibilidad/es/biodiversidad-desarrollo-e-inclusion-en-la-amazonia/>.
- The White House. 2012. National bioeconomy blueprint (online). Washington D. C., United States of America. 43 p. Consulted 16 June 2023. Available at https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/national_bioeconomy_blueprint_april_2012.pdf.
- Trade Data Monitor. 2023. Bienvenidos a Trade Data Monitor (online, web page). Consulted 14 June 2023. Available at <https://www.tradedatamonitor.com/es/>.
- Trigo, E; Chavarría, H; Pray, C; Smyth, SJ; Torroba, A; Wesseler, J; Zilberman, D; Martinez, J. 2023. The bioeconomy and food systems transformation (online). Sustainability 15(7):1-12. Consulted 14 June 2023. Available at <https://www.mdpi.com/2071-1050/15/7/6101>.
- Trigo, EJ; Henry, G; Sanders, J; Schurr, U; Ingelbrecht, I; Revel, C; Santana, C; Rocha, P. 2013. Towards bioeconomy development in Latin America and the Caribbean: bioeconomy working paper no. 2013-01 (online). Cali, Colombia, ALCUE-KBBE. Consulted 14 June 2023. Available at https://agritrop.cirad.fr/567934/1/document_567934.pdf.
- UN (United Nations, United States of America). 2017. Transforming our world: the 2030 Agenda for Sustainable Development (online). New York. Consulted 14 June 2021. Available at <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>.
- UN (United Nations, United States of America). 2023. Los ODS en América Latina y el Caribe: centro de gestión del conocimiento estadístico (online, web page). Consulted 16 June 2023. Available at https://agenda2030lac.org/estadisticas/banco-datos-regional-seguimiento-ods.html?indicator_id=4081&lang=es.
- UNDP (United Nations Development Programme, United States of America). 2010. América Latina y el Caribe: una superpotencia en biodiversidad: un documento de política (online). New York. Consulted 16 June 2023. Available at <https://www.undp.org/es/latin-america/publications/latin-america-and-caribbean-biodiversity-super-power>.

- UNEP-WCMC (United Nations Environment Program, World Conservation Monitoring Centre, United Kingdom). 2016. El estado de la biodiversidad en América Latina y el Caribe: una evaluación del avance hacia las metas de Aichi para la diversidad biológica (online). Cambridge. Consulted 16 June 2021. Available at <https://www.cbd.int/gbo/gbo4/outlook-grulac-es.pdf>.
- Yang, Y; Tan, X; Shi, Y; Deng, J. 2023. What are the core concerns of policy analysis?: a multidisciplinary investigation based on in-depth bibliometric analysis (online). Humanities & Social Sciences Communications 10(190):45-72. Consulted 14 June 2023. Available at <https://doi.org/10.1057/s41599-023-01703-0>.



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