



# Oportunidades e Desafios da Bioeconomia na América Latina

6 de Outubro 2020



MINISTÉRIO DA  
CIÊNCIA, TECNOLOGIA  
E INOVAÇÕES





# Opportunities and challenges of the bioeconomy in Latin America

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NACIONES UNIDAS

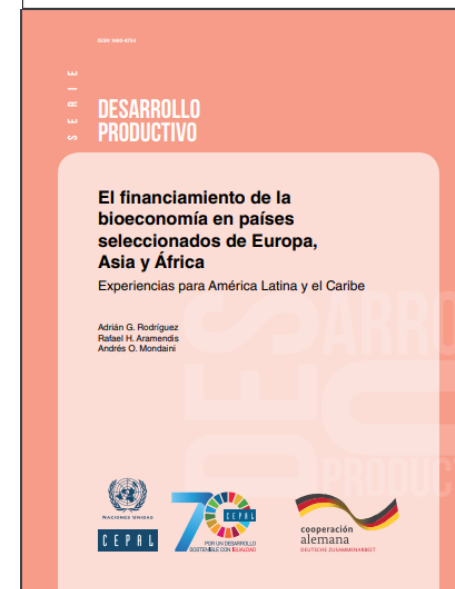
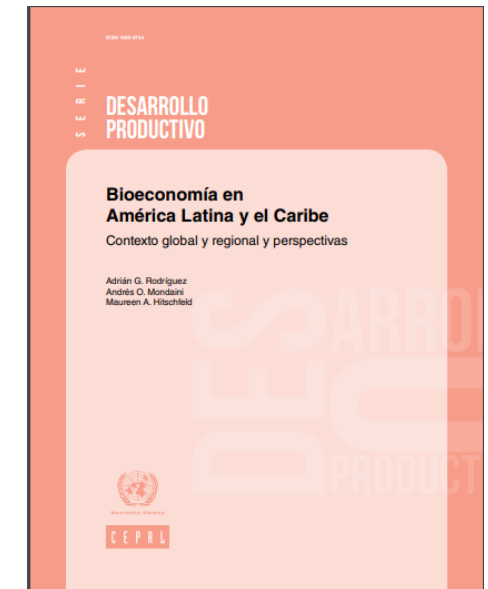
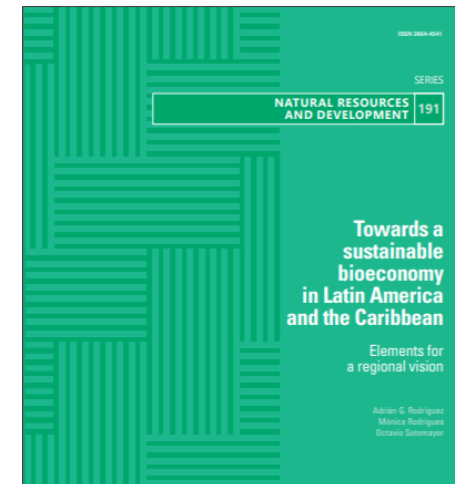
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# Main messages

1. The Bioeconomy offers an alternative to rethink development strategies in Latin America.
2. The current international context is favorable for the bioeconomy, and policy interest is growing.
3. With the pandemics, the time for the bioeconomy has come!
4. In a post-COVID-19 world, the bioeconomy provides for a systemic approach to food, energy, and health.



# Rethinking our development model



# Many possible goals

- ❑ Reduce dependency from fossil resources
- ❑ Diversification and de-commoditization of agricultural production; increased value added
  - Revival of rural areas: the bioeconomies, closing urban – rural development gaps
  - New economic activities, good jobs and income generation, opportunities for the youth
- ❑ Overcome the dichotomy between industrialization and natural resources-based development strategies
- ❑ Bioeconomy as a catalyst for innovation – aligning S & T capacities with availability of biological resources and their sustainable use
- ❑ **Bioeconomy and structural change**
  - activities and productive processes that are intensive in learning and innovation;
  - promotes links with rapidly expanding markets;
  - facilitate production and employment growth

# Policy integration & cohesion

## ❑ Convergence between bioeconomy-related conservation & productive development policies

- Climate change, biodiversity, forestry
- Sustainable agriculture, livestock, aquaculture, rural development
- Innovation, biotechnology

## ❑ Advance Agenda 2030

## ❑ Integrated approach to address multilateral environmental agreements

- UNFCCC (Paris Agreement, NDCs)
- UN Convention on Biological Diversity
- UN Convention to Combat Desertification

NATURE  
BASED  
SOLUTIONS

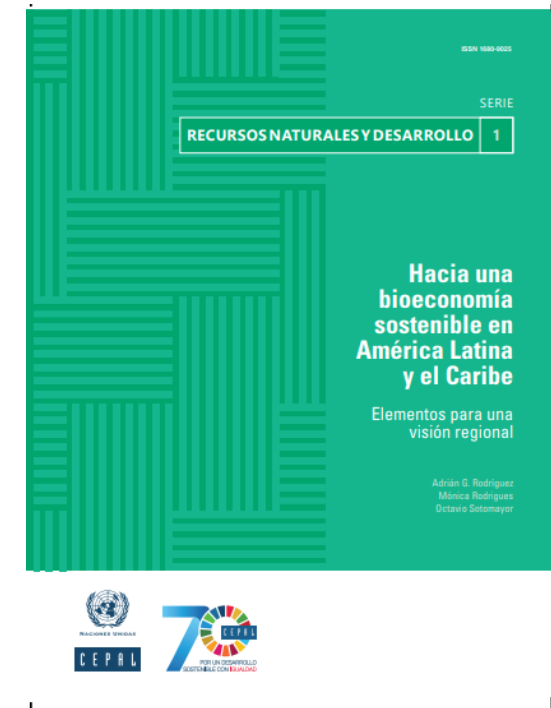
## ❑ Alignment of investments and incentives

A big push for sustainable development

The  
bioeconomy  
allows a big  
leap toward  
sustainability

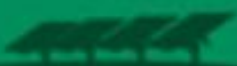
# To set the way for a sustainable Bioeconomy in LAC, we need

1. Political will and conviction
2. Dialogue with relevant Bioeconomy stakeholders & communicating with society at large
3. Market development (domestic, exports)
4. Commitment to R & D + I as a priority
5. Adequate, coherent, transparent regulations
6. Economic and financial incentives
7. IP legislation & capacities, bio-innovation, protecting knowledge
8. Informed consumers
9. Monitoring and evaluation
10. and ... [engaging young people \(entrepreneurs, scientists, policy-related\)](#)



# **A favorable international context**

It is the time for the bioeconomy!





# Before Covid-19, 2018 -2019

## OECD (2018)



- Biomass
- Biorefineries
- Bioproducts
- Biomaterials

## WEF (2018)



- Synthetic biology
- Replication of natural processes
- Biochemicals and natural biomaterials
- Natural functions and processes



## BOSTON CONSULTING – WBCSD (2019)



## FRAUNHOFER (2018)

- Industrialization, innovation, infrastructure: production processes inspired by nature
- Renewable resources to ensure health and nutrition
- Circular economy: sustainable consumption and climate protection

**“I think the biggest innovations of the 21st century will be at the intersection of biology and technology. A new era is beginning.”**

Steve Jobs

**“It is difficult to imagine any area of our future life that will not be impacted by biological transformation.”**

Prof. Dr. Wiltrud Treffenfeldt DOW Europe, Chief  
Technology Officer Europe, Middle East, Africa & India  
Member of the Senate of the Fraunhofer-Gesellschaft

# With COVID-19, the time for the bioeconomy has arrived!



# Mc Kinsey & Company



**The Bio Revolution: Innovations transforming economies, societies, and our lives**

A confluence of advances in biological science and accelerating development of computing, automation, and artificial intelligence is fueling a new wave of innovation. **This Bio Revolution could have significant impact on economies and our lives, from health and agriculture to consumer goods, and energy and materials.**

While the impact of COVID 19 was still unfolding at the time of writing in April 2020, **bio innovations had been deployed to aid the response.**

**The potential scope and scale of the (direct and indirect) impact of biological innovations appear very substantial.**

- As much as 60 percent of the physical inputs to the global economy could be produced biologically.
- Around one-third of these inputs are biological materials (such as wood).
- The remaining two-thirds ... could, in principle, be produced using innovative biological processes (for instance, bioplastics)

# International Monetary Fund



## Greening the Recovery

### *Special Series on Fiscal Policies to Respond to COVID-19*

The COVID-19-induced economic crisis does not change the basic climate challenge, [but] decisions taken now will shape the climate for decades.

The depth of the crisis and the scope of the response mean that the policy steps taken now are likely to have lasting effects on the global economy and will shape societies for decades to come

Fiscal policymakers should thus create a “green” recovery.

Chose to support green, rather than brown, activities

Boosting climate-smart infrastructure

Developing and adopting climate-smart technologies

Supporting adaptation

Avoiding carbon-intensive investments

# The World Bank



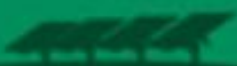
## Planning for the economic recovery from COVID-19: A sustainability checklist for policymakers

[Sustainability Checklist for Assessing Economic Recovery Interventions](#)

Factoring in sustainability in the broadest sense means also including longer-term criteria: decarbonization, long-lasting resilience and adaptive capacity, the impact on physical, natural and human capital, among others

The choices that governments make to restart their economic engine, including the long-term social, economic, and environmental co-benefits they seek to achieve through their stimulus investments, will be extraordinarily consequential in ensuring that they can build back stronger and better.

# The opportunities brought by COVID-19



# The Covid-19 pandemic and the bioeconomy

- **A context of global environmental changes**

- Climate change
- A fossil resources-based economy
- Loss and degradation of biodiversity

- **Questions raised by Covid-19**

- Relationship with the environment - one health
- The resilience of global value chains

- **Winning sectors and activities with the Pandemic:**

- Agriculture and food production,
- The health sector,
- Biotechnological applications,
- The digital economy.

**Agri-food system  
Energy system**

**Health system**

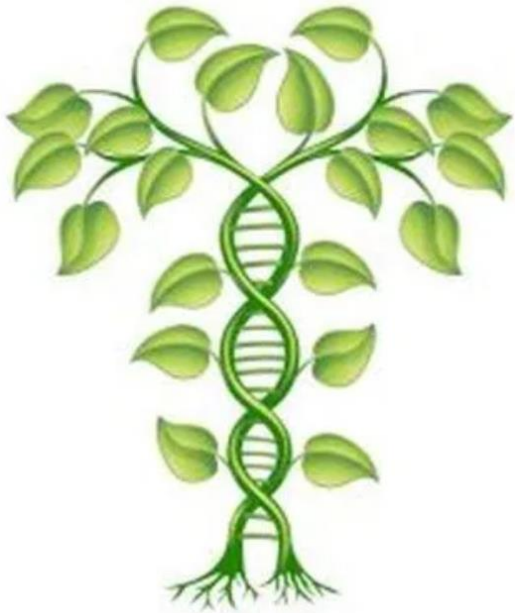
**Agri-food system  
Health system**



# The agri-food system

## • The enablers

- *Biological resources*
- *Bio-based inputs*
- *Traditional and modern biotechnologies*



## • The activities

- *Food production: crops, livestock, fisheries and aquaculture*
- *Food processing and packaging*
- *Food distribution*
- *Food Consumption*
- *Agrifood residues and waste disposal*



## • The results

- *Food security (availability, access, use)*
- *Environmental security*
- *Social welfare*

# The energy system

## • The enablers

- *Energy crops*
- *Algae, microorganisms, bacteria,*
- *Waste valorization (from agriculture, livestock, forestry, food processing, food use)*
- *Biotechnologies (industrial), artificial photosynthesis*



[https://www.youtube.com/watch?v=8y5\\_-xkBV2U](https://www.youtube.com/watch?v=8y5_-xkBV2U)



## • The activities

- *Energy production (solid & liquid biofuels, bioelectricity, biogas, bio-solar energy)*
- *Energy distribution*
- *Energy use*



<https://defensetechconnect.com/2020/05/19/biosolar-cell-generates-electricity-using-two-types-of-bacteria-lasts-longer/>

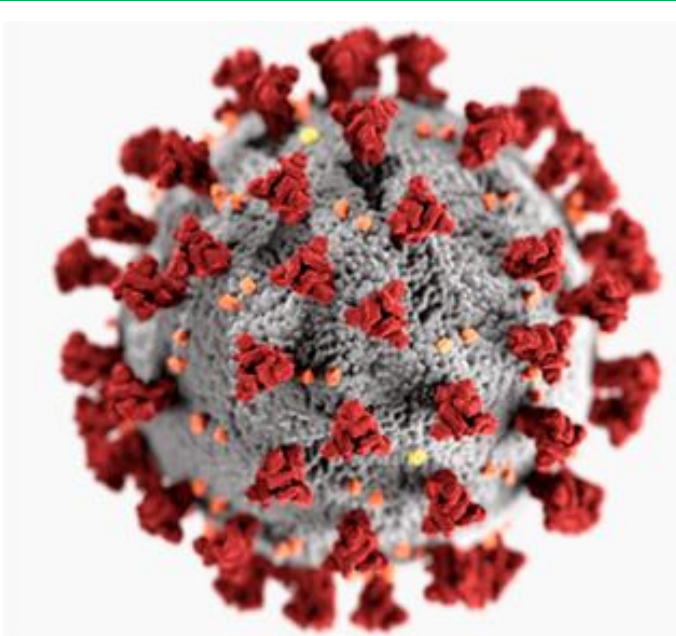
## • The results

- *Energy security*
- *Environmental security*
- *Social welfare*

# The health system

## • The enablers

- *Genetic resources, microorganisms*
- *Biotechnologies*
- *Technological convergence (Nano-Bio-Info-Cogno)*



## • The activities

- *Pathogen detection*
- *Disease diagnostics*
- *Disease treatment, biopharmaceuticals*
- *Personalized medicine*
- *Vaccine development*



## • The results

- *Human health*
- *Animal health and Plant health*
- *Environmental health*

Documentos de Proyectos

El aporte de la biotecnología médica frente a la  
pandemia de Covid-19 y lecciones para su desarrollo  
mediante las estrategias nacionales de bioeconomía

Estudios de caso de Colombia, Costa Rica y Uruguay

Adrián Rodríguez  
Rafael Aramendis  
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Lucie Pittaluga



CEPAL



# El aporte de la biotecnología médica frente a la pandemia de Covid-19 y lecciones para su desarrollo mediante las estrategias nacionales de bioeconomía

## Estudios de caso de Colombia, Costa Rica y Uruguay

Webinar 9.09.2020 -- <https://www.youtube.com/watch?v=qsRPckFGfZw&t=321s>

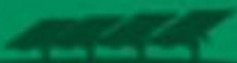
# Lessons for the development of the bioeconomy

- Increasing the credibility of science and science-based decisions
- Collaboration between the public, private and science and technology sectors to mobilize existing capacities.
- Multidisciplinary work (overcoming professional silos)
- Articulation of financing mechanisms
- Integration and use of new technologies
  - In managing the pandemic (digital technologies)
  - In the development of solutions to face the pandemic (bio-nano-digital convergence) La complementación entre la formación profesional y la técnica
- Clusters as a development strategy
- The importance of the power of convocation and purchase of the Government.

**Obrigado!**

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<https://www.facebook.com/BioeconomiaAmericaLatina/>



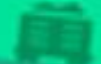
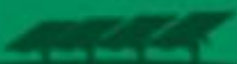
**Invitation:  
III Global Bioeconomy Summit  
16 – 20 November 2020**

International Advisory Council on  
Global Bioeconomy

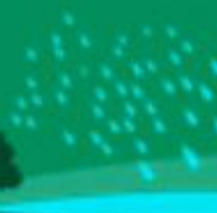
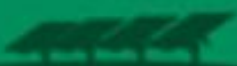
Global  
Bioeconomy  
Summit

16 to 20 November 2020  
fully virtual

<https://gbs2020.net/>



# **Anex: ECLAC activities on bioeconomy**





# Meetings, seminars, conferences

- ***"Primer Simposio Latinoamericano de Bioeconomía. Repensando el desarrollo"***, Argentina, 10 julio 2019, organizado conjuntamente con el Gobierno de Argentina, OIT, UNESCO, IICA y CIECTI / CONICET - <http://www.bioeconomia.mincyt.gob.ar/1er-simposio-latinoamericano-de-bioeconomia/>
- ***Taller sobre cooperación e intercambio de conocimientos sobre políticas públicas para la bioeconomía***, 26 y 27 de junio de 2018, sede de la CEPAL (Santiago, Chile), con el apoyo financiero de la Cooperación alemana.
- ***Regional Seminar Bioeconomía en América Latina y el Caribe***, 24 - 25 enero 2018, Sede de la CEPAL (Santiago, Chile), organizada por la CEPAL como parte del Programa de Trabajo CEPAL-Francia, con la colaboración de la Cooperación Alemana y la Oficina Regional de la FAO - [http://conferencias.cepal.org/bioeconomia\\_AL/](http://conferencias.cepal.org/bioeconomia_AL/).
- ***Conferencia internacional– bioeconomía en América Latina y el Caribe 2015 - oportunidades para la agricultura y la agroindustria*** (Santiago, Chile), 7 y 8 de octubre 2015, organizada conjuntamente por CEPAL y ALCUE-NET, con la participación de representantes de países de América Latina y Europa y de Sudáfrica - [http://conferencias.cepal.org/Conferencia\\_bioeconomia/](http://conferencias.cepal.org/Conferencia_bioeconomia/).

# Publications ...

1. Rodríguez, Adrián y Aramendis, Rafael (2019). *El financiamiento de la bioeconomía en América Latina Identificación de fuentes nacionales, regionales y de cooperación internacional*. Serie Recursos Naturales y Desarrollo No. 193, CEPAL, Santiago, Chile.  
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2. Rodríguez, Adrián; Rodrigues, Mónica y Sotomayor, Octavio (2019). *Towards a sustainable bioeconomy in Latin America and the Caribbean: Elements for a regional vision*. Natural Resources and Development series 191, ECLAC, Santiago, Chile. [https://repositorio.cepal.org/bitstream/handle/11362/44994/1/S1901014\\_en.pdf](https://repositorio.cepal.org/bitstream/handle/11362/44994/1/S1901014_en.pdf)
3. Rodríguez, Adrián; Rodrigues, Mónica y Sotomayor, Octavio (2019). *Hacia una bioeconomía sostenible en América Latina y el Caribe, elementos para una visión regional*. Serie Recursos Naturales y Desarrollo No. 191 , LC/TS.2019.25, CEPAL, Santiago, Chile.  
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4. Rodríguez, Adrián; Aramendis, Rafael y Mondaini, Andrés. (2018). *El financiamiento de la bioeconomía en países seleccionados de Europa, Asia y Africa: Experiencias relevantes para América Latina y el Caribe*. Serie Desarrollo Productivo No. 222, LC/TS.2018/101, CEPAL, Santiago, Chile.  
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# ... publications.

6. Henry, Guy; Rodríguez, Adrián; Trigo, Eduardo. (2018). Latin America's developing bio-economies: concept note for a regional panel discussion @ GBS2018. Global Bioeconomy Summit 2018, 19-20 April 2018, Berlin, Germany. [https://gbs2018.com/fileadmin/gbs2018/Downloads/GBS18\\_CN\\_LACpanel\\_v13Abr.pdf](https://gbs2018.com/fileadmin/gbs2018/Downloads/GBS18_CN_LACpanel_v13Abr.pdf)
7. Aramendis, Rafael; Rodríguez, Adrián; y Krieger, Luiz (2018). *Contribuciones para un gran impulso ambiental en América Latina y el Caribe: Bioeconomía*. Serie Documentos de Proyectos, LC/TS.2018/51, CEPAL, Santiago de Chile. [http://repositorio.cepal.org/bitstream/handle/11362/43825/1/S1800540\\_es.pdf](http://repositorio.cepal.org/bitstream/handle/11362/43825/1/S1800540_es.pdf)
8. Rodríguez, Adrián; Mondaini, Andrés; and Hitschfeld, Maureen (2017). *Bioeconomía en América Latina y el Caribe. Contexto global y regional y perspectivas*. Serie Desarrollo Productivo No. 215, LC/TS.2017/96, CEPAL, Santiago, Chile. [http://repositorio.cepal.org/bitstream/handle/11362/42427/1/S1701022\\_es.pdf](http://repositorio.cepal.org/bitstream/handle/11362/42427/1/S1701022_es.pdf)
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10. Unidad de Desarrollo Agrícola, CEPAL (2015). *Nuevas oportunidades para la agricultura*. Traducción de la sección "Focus", del *Rural 21: the International Journal of Rural Development*, Vol 48, No. 2, 2012, pp. 6 -27). [http://repositorio.cepal.org/bitstream/handle/11362/38427/1/S1500414\\_es.pdf](http://repositorio.cepal.org/bitstream/handle/11362/38427/1/S1500414_es.pdf)