Sustainable Energy, Water and Food Systems

Bioeconomy: A Sustainable Development Strategy

Hugo Chavarria (Inter-American Institute for Cooperation on Agriculture (IICA)),
Eduardo Trigo (Inter-American Institute for Cooperation on Agriculture (IICA)),
Federico Villarreal (Inter-American Institute for Cooperation on Agriculture (IICA)),
Pablo Elverdin (Grupo de Paises Productores del Sur (GPS)),
Valeria Piñeiro (International Food Policy Research Institute (IFPRI))

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Developing the bioeconomy offers a significant opportunity for achieving the Sustainable Development Goals (SDG) at the global level, while at the same time serve as strategic instruments for addressing new challenges emerging from the COVID-19 global crisis. Advances in science and technology and existing experiences, fully support expectations in this sense. However, effective progress will be only possible if national strategies evolve within a coherent and harmonized global framework. The G20 has a strategic role in promoting this transition not only among its members, but within the broader development community. Three specific lines of action are proposed in support of this transition: (i) a broader agreement on guiding principles for global bioeconomy policymaking; (ii) a framework of credible bioeconomy indicators; and (iii) an effective bioeconomy knowledge management platform.

Challenge

The world faces today the challenge of responding to not only the new issues emerging from the COVID-19, but also the challenges related with climate change and increasing restrictions on natural resources while sustainably meeting a growing demand for energy and food. There is mounting evidence that the “business as usual” implicit in the current energy and industrial matrix, is no longer an option and there is the need to find alternatives. In this context the bioeconomy – understood as the knowledge-intensive use of biological resources for the production of all kinds of products and services across all sectors of the economy– is becoming mainstream as a strategic vision for economic and sustainable development. Based on the core idea of the gradual replacement of non-renewable fossil resources used in industrial production and energy supply by renewable biogenic feedstock, could pave the way for a more sustainable, resource efficient economy and offer opportunities to support growth and jobs, or address climate change, food security and resource depletion (OECD, 2018). In this sense, the bioeconomy is an idea closely related to that of the circular economy, although the concept goes, from the sustainability perspective, beyond it; while the circular economy focusses on cascading to extend life cycles and minimize residues, the bioeconomy its circular by nature, since it is driven by the objective of the replacement of fossil resources (Carus, 2020). Today it is increasingly considered as the means for achieving key Sustainable Development Goals (SDGs) related to food security and nutrition; health and well-being; and clean water and sanitation, among others (Von Braun, 2013; IICA/FAO/CEPAL, 2019) (See Annex).

Many also identify the bio-economy as a substantial contribution to bring together reindustrialization and the renewal of rural areas. The convergence of scientific and technological advances in biology, the hard science and engineering and the demands of sustainability is giving rise to innovative new production strategies and business models which offer concrete options for an increased convergence between energy generation, food and raw materials production and the care of natural resources objectives, which translate into increasing
investment, employment and sustainable wealth creation opportunities. The increased visibility of sustainability issues is of particular importance for the future of many developing countries that continue to have high dependence on the agricultural resources based sectors (OECD, 2019; El-Chichakli et al., 2016; IICA/FAO/ECALC, 2019); furthermore as a large proportion of the world youth — particularly in the poorest segments of society — are expected to be in the rural areas (OECD, 2018), a more diversified rural bioeconomy offers a concrete opportunity to create real value sustainably and inclusively.

Reflecting these new perspectives, at least 49 countries, including most OECD countries, have bio-economy related strategies in place, and there are many concrete examples of private sector led initiatives which are tangible examples of both the viability and potential of the new concepts.

Proposal

Irrespective of the general agreement that the bioeconomy holds a great promise in terms not only of global environmental benefits, but also in promoting much needed transformation at the national level, through new cycles of innovation and investments, there growing evidence that many of its components could play a significant role in addressing the issues emerging from present COVID19 crisis; the current rapid responses that the biotechnology-based industry is offering in terms of the development of the diagnostics kits and eventually of an effective vaccine, can be expected to heighten further strengthen support for bio-based strategies. Biotechnology — as well as other technologies within the bioeconomy — will also become strategic instruments in the post-COVID transformation of food systems, including more efficient production and biomass valorisation processes, bioenergy and platforms for quality and health assurance throughout the food chain, among others. The issue, however, is that most of existing experiences are young, still in the making and have been evolving from a different set of priorities than those most economies will confront in the month/years to come as the world comes out of the present pandemic. In this context, the G20 is in an especially powerful position to contribute to the very much needed convergent perspectives among policy makers from different parts of the world so that bioeconomy solutions to present and future social and economic challenges can express to their fullest potential.

The G20 as the foremost fora for global economic political cooperation should focus on promoting a common understanding on objectives and strategies through the deliverance of a number of concrete public goods on a global basis to facilitate exchange of technology and coordinating funding from both the public and private sector, common methodologies for the development of credible and effective economic indicators to support public and private decision making, and general principles of good practice to support those processes. All stakeholders should participate in this process to ensure that the actions proposed by the G20 countries are translated into concrete action at the local level.

Proposal 1: Concerted efforts to share and disseminate information and experiences

In this context, a concerted effort aiming to share and disseminate existing information and experiences related to the bioeconomy, as basis for a broader consensus on effective policies and investments to facilitate the transition of its development both at the national level and at a global scale. The G20 and the international development community, particularly development banks, can play a very useful role in supporting this conversion to a more sustainable productive system in development countries, which include most of the leading bio-based economies, have more than a decade of experience at formulating and implementing policies and programs that promote and support the bioeconomy. Over this period, they have been able to develop concrete information on what works and what does not as well as to assure the safety and sustainability of the new approaches. Since in the coming years we can expect significant resource constraints, these experiences could be highly valuable as a platform for more efficient and effective societal transformation process, such as the consolidation of the bioeconomy, which demands consistent long-term policy perspectives.

Looking into the above, it is proposed that the G20 supports the process initiated around the Global Bioeconomy Summit to bring together stakeholders from around the world to conform a platform connecting informed opinion leaders and trusted sources in the diverse fields of bioeconomy policy and sustainable development. Such an initiative could provide a neutral place to promote consensus building on how different pathways of bioeconomy will contribute to sustainable development, while inspiring policy and innovation stakeholders globally to turn ideas and recommendations into reality, and to collaborate to enable successes in other countries and regions and G20 support could
become strategic in assuring its further institutionalization as the place to address bioeconomy development issues from a global perspective, while at the same time assuring due consideration of issues affecting smaller countries in the developing world. Critical issues to focus at this level include, among other issues, (i) greater consensus among different stockholders – public, private – on the potential of the bioeconomy, (ii) promote better management capacities, (iii) promote R+D support for bioeconomy related technological challenges, (iv) promote market development for bioeconomy products.

Proposal 2: Credible bioeconomy indicators for guiding decision making and investments, and monitor progress towards objectives.

Bioeconomy is a dynamic and complex societal transformation process, which demands a long-term policy perspective. This process implies major changes in development pathways as well as significant potential new conflicts (i.e. eventual land use conflicts between food and energy production, among others). Existing economic indicator systems seldom reflect the nature of the new resource-production-consumption relations implicit in the bioeconomy vision. Since the bioeconomy is cross-cutting, many of the metrics commonly used to classify, collect, and report economic data fail to capture bioeconomic activity in its entirety. Furthermore, most of the bioeconomy products and processes often replace existing ones so existing statistics do not fully reflect their benefits, costs and risks, making evidence-based decision making processes – both at the public and private level – difficult and erratic, so there is the need to revise existing methodologies in line with the characteristics of the new bio-based activities, at least in reference to (i) the contributions of the bioeconomy to the country’s economic and social objectives (e.g. growth, employment, food security and exports), (ii) basic data on strategic components of the bio-based business (e.g. availability, investments and capacities), (iii) nature and magnitude of the linkages between bio-based and convention sector of the economy, (iv) environmental performance indicators of specific bio-based activities and sectors, (v) eventual risks (e.g. environmental and health) associated to the emerging bio-based activities.

These needs are of general interest to the whole of the international community and confronting the challenges it implies would be best achieved through international multi-stakeholder cooperation, as this would reduce the risks of duplications and enhance possible synergies. Given its political reach, the G20 is the logical platform for promoting a joint effort within the development cooperation community, the development of harmonized conceptual and operational approaches for such a set of indicators.

Proposal 3: Synthesizing best practices for bioeconomy policymaking

Strengthening G20 country strategies for domestic development of the bioeconomy. A number of G20 countries are already including the bioeconomy within their development strategies (Germany, USA, UK, Spain, Brazil, Argentina, among others). Other members of the G20 should follow suit by reviewing their national plans in order to increase the relevance of the bioeconomy as a more effective global instrument in pursuance of the Sustainable Development Goals (SDGs). Following this, it would be desirable that the G20 calls on a consortia of international cooperation organizations to develop a succinct document of non-binding best practices for bioeconomy policy making, similar to the G20 Guiding Principles for Investment Policymaking at the 2016 Hangzhou Summit.

Some of G20 countries are global leaders in the bioeconomy, with large and valuable experiences, already being reflected in their development strategies. Building on these assets, the G20 has the opportunity to lead the construction of consensus that will facilitate the transition towards a more inclusive and sustainable development model by promoting the sharing of information and experiences to create common perspectives and help decision making both at the policy level, as well as to mobilize the needed innovations for the new visions to be effectively implemented in terms of income and productivity improvements, assuring food security and addressing climate change. Specific aspects include, among others, (i) how to identify the bioeconomy potential for a given country, or territory, and the main strategic intervention areas, (ii) best practices for governance and policy development and implementation.


APPENDIX

Bioeconomy contributions to the Sustainable Development Goals
Potential Contribution  

**SDG that contribute**  
Productive models that take advantage of science and technology to use biological resources sustainably and efficiently to make substitutes for petrochemicals (for example, bioenergy, biofertilizers or bioplastics) or to satisfy new consumer demands (for example, functional foods or biocosmetics).

SDG 2: Sustainable Food Production

SDG 3: Good Health and Well-Being

SDG 7: Affordable and Clean Energy

SDG 9: Industry and Innovation

SDG 13: Climate Action

Use of productive practices that contribute to environmental sustainability and resilience, while adding productivity and efficiency.

SDG 13: Climate Action

SDG 15: Life on Land

Circular economy production systems, through the productive use of waste biomass derived from production and consumption processes.

SDG 11: Sustainable Cities and Communities

SDG 12: Responsible Consumption and Production

Development of products, processes and systems replicating processes and systems observed in nature.

SDG 9: Industry and Innovation

SDG 14: Sustainable Use of Underwater Biodiversity

SDG 15: Sustainable Use of Land Biodiversity

Bioremediation to face environmental contamination problems (for example, recovery of degraded or...
Bioremediation to face environmental contamination problems (for example, recovery of degraded or contaminated soils, treatment of water for human consumption and wastewater, etc.).

SDG6: Clean Water and Sanitation

SDG 15: Prevention of Soil Degradation

Increase in the economic density of rural territories thanks to the new industrialization and local use of biomass for the generation of bioproducts and bio services.

SDG 8: New Sources of Decent Work and Sustainable Economic Growth

Source: Author’s spreadsheet

References

1. Carus, Michael (2020). The bioeconomy is much more than the bioeconomy. 
   [More Information]

   [More Information]

   [More Information]

4. IICA, ECLAC, FAO. (2019). The Outlook for Agriculture and Rural Development in the Americas: A Perspective on Latin America and the Caribbean 2019-2020
   [More Information]

   [More Information]

6. OECD. (2018). The Future of Rural Youth in Developing Countries: Tapping the Potential of Local Value Chains, Development Centre Studies.
   [More Information]

   [More Information]


Existing Initiatives & Analysis