

Knowledge-based bio-economy: challenges and opportunities for Latin America

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It is widely recognised that biodiversity erosion will continue for as long as its full economic value is under-explored and not captured. Whereas a number of approaches for generating economic value from biodiversity have been or are currently being tested, only a few focus on advanced technologies and those in areas of high volume biomass conversion. However, scientific and technological advancements in the last few years have been quite phenomenal and make possible to engage in 'win-win' scenarios coupling bioprospecting with biodiversity conservation.

Numerous technology applications are suitable for the screening of biological resources, the identification of novel compounds of industrial interest (e.g. specialty chemicals, industrial enzymes, biopesticides, essential oils, etc.) and the incorporation of components of biological material into high-value commercial products in food and food-supplements. Unlike biomass conversion, which requires considerable capital inputs and poses significant logistical challenges, these applications are particularly suitable for the involvement of local communities, small and medium-size enterprises (SMEs) and technology groups.

Bioprospecting involves several distinct phases each of which results in the addition of extra value and requires different technologies at different degrees of sophistication:

- Explore the genetic and biochemical diversity captured in natural resources;
- Discover bio-active compounds of potential industrial interest;
- Utilise these resources to produce sustainable high added value eco-friendly bioproducts and to generate employment and income for rural communities.

The utilisation of novel technologies to develop high-added value products offers unprecedented opportunities not only for advanced technology countries which could benefit from an additional push towards a knowledge-based bio-economy, but also for developing countries which could leverage their genetic resource endowment for sustainable economic development, technology transfer and for catalysing additional research and investment. Bioprospecting through partnerships with the owners of technological know-how can generate new sources of income which would reduce the pressure to use land for conventional agricultural production and which could be invested in conservation programmes.

However, the application of new technology for value-addition of biodiversity depends on capacities to:

- Evaluate current and pipeline technologies with a potential to add economic value to genetic resources;
- Optimise human, industrial and financial resources to meet specific developmental needs and increase competitiveness through technology alliances and knowledge networks;
- Overcome institutional and market constraints that hinder the adoption of bio-transformation technologies by industry;
- Institute effective regulation that is consistent with international agreements (e.g. WTO-TBT, Cartagena Protocol of the Convention on Biological Diversity (CBD));
- Put in place instruments allowing access to intellectual property assets and institute equitable access and benefit sharing arrangements between the owners of the genetic resources and the owners of the technology in compliance with CBD;
- Link public research with private sector industry.

Although these capacities are in short supply in most developing countries, it is realistic to expect that major gains can be achieved through facilitator mechanisms creating awareness for opportunities offered by technology, identifying best suitable technology options and fostering access to technological know-how through partnerships, the engagement of SMEs in such partnerships and, whenever necessary, strengthening institutional capacities in research and technology management.

This paper focuses on the challenges and opportunities of fostering such facilitator mechanisms.