The Circular Bioeconomy

Knowledge Guide

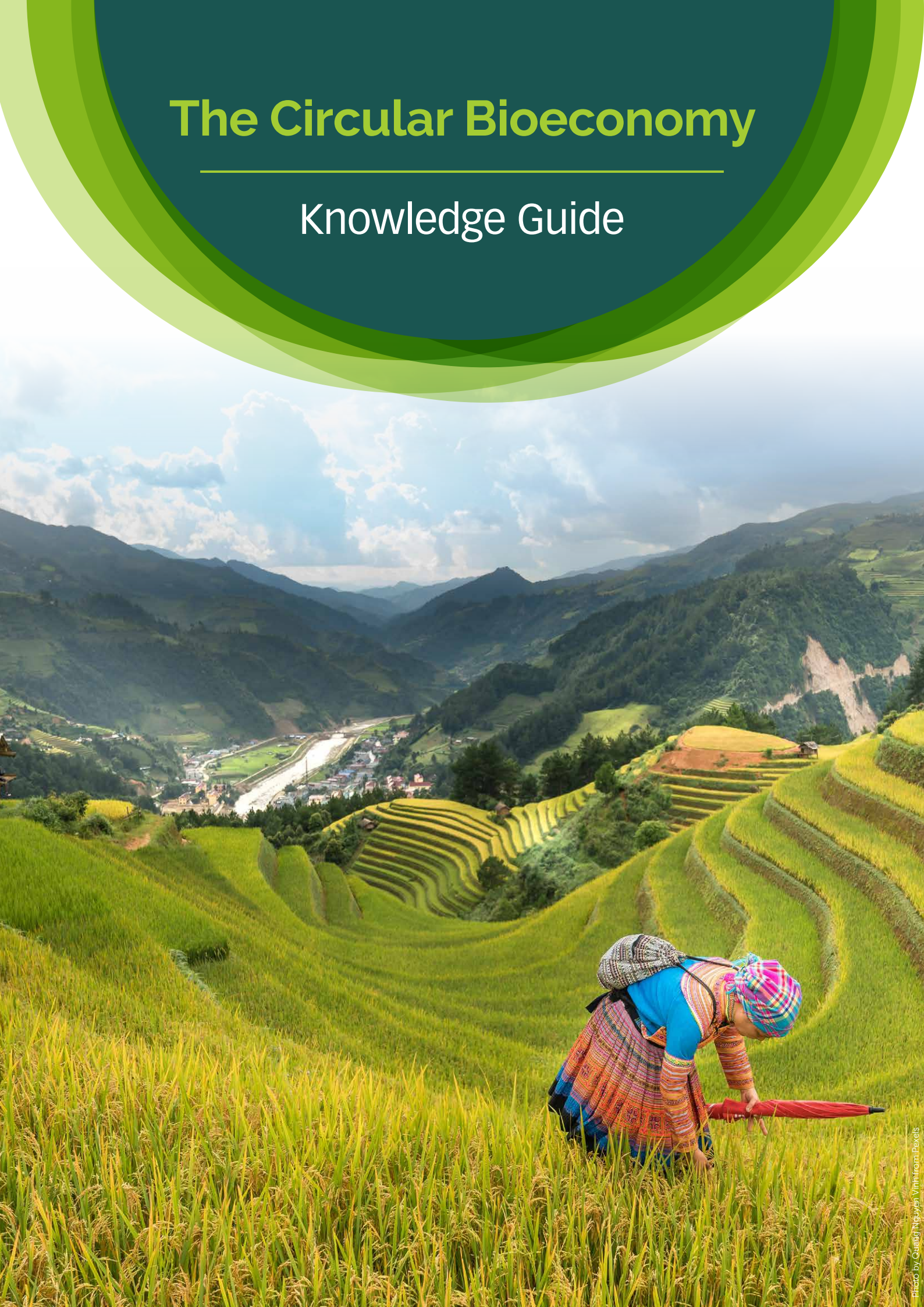

Photo by Quang Nguyen Vinh from Pexels

Our economic system has failed to value nature. A circular bioeconomy offers a solution.

What is a circular bioeconomy?

A circular bioeconomy is an economy powered by nature. It is a new economic model that emphasizes the use of renewable natural capital and focuses on minimizing waste, replacing the wide range of non-renewable, fossil-based products currently in use.

The approach is different from current systems by design, with materials used for as long as possible and emissions-reducing practices put into place. Land and marine ecosystems, production sectors like agriculture and forestry, and the industrial sector work in an intentionally crafted, circular manner, with scientific approaches and technological innovations employed to create more sustainable materials and spur regeneration.

Why do we need it?

Our current economic system has succeeded in stimulating economies, creating enormous wealth and spurring human development. But it has failed to create equitable societies and preserve nature. This is threatening global stability.

A circular bioeconomy offers the opportunity to transform our land, food, health and industrial systems. In places in the Global South where people depend on forests for their livelihoods, it could make for more sustainable local landscapes and new income opportunities from those landscapes.

This transition will bring with it opportunities for decarbonization, and contribute to managing and rebuilding ecosystems and landscapes that desperately need it.

Shifting the energy and extractives system to circular and resource-efficient models can lead to

US$3.5 trillion
in business opportunities

87 million
jobs by 2030.

CASE STUDY

In Nairobi, Kenya, 9 out of 10 households use charcoal for cooking. Charcoal production to supply the city is an important livelihood in rural reas. A fine dust is often left behind in sacks and stoves. That dust can be collected and mixed with a starch binding agent to become briquettes that can be used as fuel. There is income potential in the sale of these briquettes, having been produced from what was once considered waste.

Photo by Ollivier Girard/CIFOR

Some considerations for implementation:

Partnership:
A circular bioeconomy requires change across many sectors, and engagement across those sectors will be important for success. CIFOR-ICRAF's new Transformative Partnership Platform on the Circular Bioeconomy will provide an open space for discussing, promoting and implementing the circular bioeconomy model for developing countries.

Local needs:
Approaches need to be tailored to localities – the Global North and Global South have particular challenges that circular bioeconomy models need to take into account.

Focus on developing world:
Efforts need to be integrated and participatory, with consideration of users in developing countries so they are not – again – left behind.

Landscape diversification:
Landscapes need help to diversify in ways that include a mix of bioenergy crops, agroforestry, permanent forest restoration and less coal pollution.

Rural-urban flows:
With a projected 68% of the world's population living in urban areas by 2050, and urban citizens consuming more than rural ones, circular bioeconomy approaches must focus on the resulting material flows and the massive pressures on land, water, mineral and biological resources near cities.

What is a forest-based bioeconomy?

There are different circular bioeconomy approaches, varying according to local realities and needs. Some emphasize the business side, others the solutions technology can offer.

A forest-based bioeconomy is a subsector of circular bioeconomy concepts. It focuses on the transformation of our current system through the conscious use, and re-use, of forest materials.

This economy would look different in different places. In Europe, for example, emphasis may be put on replacing fossil-based raw materials used in objects ranging from packaging to clothing with innovative wood-derived items. In sub-Saharan Africa, where the necessary collection of wood for fuel is widespread, a forest-based bioeconomy might include creating new value chains to result in forest-based products and services that generate more local profit.

CIFOR-ICRAF, EFI, The Finnish Innovation Fund Sitra and other partners place enormous weight on creating fair solutions that involve developing countries and vulnerable communities, identifying their needs from the very start. This is essential for a better-built, forest-based world.

Forest and landscape degradation costs the world

US$6 trillion

annually in lost services, goods and livelihoods.

Managing agriculture, forestry, wetlands and bioenergy sustainably and holistically could contribute

>30%

of the global climate mitigation effort while, at the same time, addressing urgent health challenges.

How does it work? How do forests fit in?

The circular bioeconomy relies on biodiversity, for it is at the heart of a functioning ecosystem that can perform, adapt and evolve.

Forests are key because forests are the main source of non-food, non-feed renewable biological resources. Wood is the most versatile renewable material on earth, and is fundamental to making the circular bioeconomy work.

In a circular bioeconomy, wood-based products replace carbon intense, non-renewable materials. For example, the construction sector, dominated by concrete and steel, could be become more sustainable through the use of wood. In the textile industry, wood-based fibers could replace synthetic ones, lowering the carbon footprint.

Steel and cement are each responsible for

8%

of global greenhouse gas emissions.

For every ton of concrete replaced by a ton of wood, it is estimated that there is a carbon dioxide emission reduction by as much as

2.1 tons

over the product's lifetime.

Further reading:

Palahí M and Adams J. 2020. Why the world needs a 'circular bioeconomy' - for jobs, biodiversity and prosperity. World Economic Forum. Switzerland: Cologny/Geneva.

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Börner J, Kuhn A and von Braun J. 2017. Bio-economy in developing countries. ZEF Policy Brief No, 25. Bonn, Germany: Center for Development Research (ZEF).

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The Center for International Forestry Research (CIFOR) and World Agroforestry (ICRAF) envision a more equitable world where trees in all landscapes, from drylands to the humid tropics, enhance the environment and well-being for all. CIFOR and ICRAF are CGIAR Research Centers.